sous la direction de
LAMIA HADDA
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Villages et quartiers à risque d'abandon

Stratégies pour la connaissance, la valorisation et la restauration

TOME 1

FIRENZE UNIVERSITY PRESS

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Tunisie, village berbère de Zriba el-Alia (© L. Hadda)

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Préfaces

Giuseppe De Luca
Direttore del Dipartimento di Architettura, Università degli studi di Firenze-Italia

In one of the most difficult periods in our recent history, defined by many as "suspended", the Department of Architecture of the University of Florence DIDA, together with the Department of Architecture and Design of the University of Genoa and the Institute of Cultural Heritage Sciences of the CNR, has strongly wanted to maintain the usual methods of scientific exchange, comparison and innovative research elaborations. A meeting that was strongly desired, also to respond to the difficulties generated by the pandemic that did not allow normal academic life, research, study, and exchange between the two shores of the Mediterranean. Despite the uncertainty of the moment, we have kept the flame of scientific research alive by hosting, albeit virtually, the 8.5 edition of the RIPAM, International meetings of the Mediterranean architectural heritage.

The edition of RIPAM was numerically defined 8.5 because it represented an intermediate edition between the one held in Rabat (Morocco) in 2019 and the one scheduled in Lisbon (Portugal) in 2022. Reflecting "on the intermediate" also means reflecting indirectly on this pandemic, suspended time, which makes our life uncertain, as well as the theme of the meeting: Villages and neighborhoods at risk of abandonment. Strategies for knowledge, enhancement, and restoration.

An edition that reflects on weak Mediterranean territories, in search of innovative and unconventional strategies for their rebirth. it is an important subject of study, now common to many areas of the Mediterranean, considered as a strategic point of the new European policies. The progressive abandonment of internal regions is typical of countries characterized by economic weakness and emigration (factors that push urbanization towards major metropolitan areas), and by fragmentation (which cause both architectural and territorial problems). Aspects of this abandonment are also found in some urban areas, focusing on entire neighborhoods. In both rural and urban cases, the theme of the conference is focused on the causes of abandonment and on possible management strategies deployed at multiple levels.

The meeting was a challenge, due to the difficulties in organizing an event without being able to meet and dialogue, even for the minor aspects. it has been a success, given the considerable number of contributions that have been proposed, witnessed in this book. Researchers and scholars, who live, work and study in the three continents bordering the

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Mediterranean met: Africa, Asia, and Europe, coming from universities and research centers in 11 countries: Albania, Algeria, Croatia, France, Italy, Israel, Morocco, Portugal, Serbia, Spain, and Tunisia. Studies that embrace other national realities such as Armenia, Asia Minor, Lebanon have also enriched the debate.

The meeting was also an opportunity for discussion for all scholars and researchers interested in reflecting on design strategies to stop and try to reverse these trends, in the different sensitivities of action and in its different interpretative and implementation phases. Hence the presence of scholars and academic researchers, managers of cultural heritage, conservation and restoration professionals, conservation scientists, architecture professionals, urban planners who study, analyze and work on all the various fields of architectural heritage.

The meeting was also an opportunity to question the possible methods of intervention for what the possible countries and neighborhoods affected by abandonment phenomena in the near future will be, precisely on the basis of the principle that tomorrow will be different from today and that the crisis pandemic in progress is one of the most evident indicators of dysfunctions in the city and in the way of thinking about spatial relations.

The near future starts from the immediate present, where the Mediterranean is seen by many as an area of large migratory flows where countries of emigration, immigration, and transit face. Economic migration prevails over the total, making up many flows affecting this area. Both the countries of the north shore and those of the southern shore of the Mediterranean are the destination of millions of people in search of better living conditions.

However, an area that is not particularly large, just 2.5 million square kilometers, but overlooked by three major continents with 14 countries, for a total population of about 450 million people. But with a much broader and more extensive background with a population of about 1 billion people: one sixth of the entire world population.

Yet, the Mediterranean is not only migratory flows: it is also the history of human civilization, it has been and is a crossroads of cultures, customs, ideas, religious paths; it is an expression of different futures rooted in stories originating from local contexts. An immense source of wealth of tangible and intangible resources.

Ripam 8.5 wanted to give voice to this diversity, and I am happy to have been able to host this plurality of voices in the Department of Architecture in Florence. For this I would like

to thank everyone: starting with my predecessor, Saverio Mecca, and the president of the School of Architecture, Susanna Caccia Gherardini, who initiated and supported the project; but above all I thank the group of organizers Giovanni Pancani, Lamia Hadda, Daniela Pittaluga, Fabio Fratini, Stefano Galassi, and Massimo Carta, who were the real driving force of the international meeting.

Niccolò Casiddu
Direttore del Dipartimento Architettura e Design, Università degli studi di Genova-Italia

In 2017, the international conference RIPAM7 "Conservation et mise en valeur du patrimoine architectural et paysagé des sites côtiers méditerranéens" hosted in Genoa, at the DAD department, focused attention on some specific issues relating to the conservation of the Mediterranean architectural heritage. In particular, some elements had emerged on which it would have been appropriate to work in the following years and among these, in particular, the problem of the conservation and recovery of abandoned areas or in a state of neglect.

These first suggestions were reflected in the international conference "Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration ", organized by the University of Florence for Ripam 8.5 in November 2020; by virtue of the close link with the issues addressed in Ripam7, the DAD Department of Genoa was involved, together with the CNR of Florence, in the organization of the conference, confirming the cultural interest in the deepening and development of the comparison on those issues.

The book collects and organizes the contributions of the Florentine conference and contains several essays by experts who approach the question from different points of view. Due to its socio-economic and cultural implications, the issue of small towns in the process of depopulation is increasingly the attention of Governments and Institutions for the identification of strategies that can effectively counter the spread of this phenomenon. The problem of abandonment must be analyzed by looking at the complexity of the problem, the reasons that may underlie it, the consequences that these dynamics entail and finally the possible conservation and enhancement strategies.

In this scenario, the new socio-spatial needs caused by the pandemic and the Covid19 emergency have underlined a condition of potential fragility of metropolitan areas, both in terms of capillarization and the quality of personal services. This has led to a reconsideration, both in the public and in the academic debate, of the opportunities offered by smaller towns in terms of a better quality of living, greater sustainability of travel, a different relationship between supply and demand for services, including digital ones, in relation to the system of interpersonal relations and the supervision of a "closer" territory. It is possible to define a precise geography of these places throughout Europe, where most of the environmental and historical-architectural heritage is preserved with clear typological, morphological and

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

construction characteristics.

In Italy, a recent study prepared by the National Association of Italian Municipalities (ANCI) finds that about 70% of the 7,954 small Italian municipalities have less than 5,000 inhabitants, with a significant concentration in the Alpine and Apennine regions. As a result of the new demographic trends and the effects of concentration in the plains and coastal regions, the Italian population of the Inner Areas (Barca, 2014) represents about 1/6 of the national population (9,972,140). In particular, the municipalities with less than 1000 inhabitants are the 1963 of which 72% are small mountain villages.

These considerations become significant when we refer to the most fragile subjects, of any age and condition, who continue to live in these territories and for whom the theme of living also becomes a structural theme that is intertwined with the protection, assistance and the management of daily needs through inclusion and neighborhood service networks. ICT, home automation and the opportunities offered by Internet of Things systems, if appropriately interpreted in the digital agenda and addressed to a soft recovery or active adaptation to the environment, can increase some performances of the existing assets, in which the space virtual integrates with the structural constraints and the new accessibility requirements of the physical space.

Territorial supervision, reduction of the digital divide, enhancement and care of settled communities (healthy aging in place), with adequate support for actions aimed at the recovery and conservation of the building heritage, once again become rewarding and unavoidable categories of intervention. In line with the principles of the "National Strategy of Internal Areas" (SNAI) compared to what has already been developed for the use of EU funds 2014-2020, the technologies to support assisted living spaces represent a further horizon of research in which virtual space is not the alternative place for relationships, but constitutive of the territorial dimension capable of completing the performance of an offer calibrated to the site-specific needs of a diversified user (user-centered). "Home care" is one of the possible interpretations for addressing the problem of territorial abandonment, especially in contexts lacking infrastructure or which have seen over the years the depletion of territorial resources at the service of communities. In this perspective, two considerations emerge in particular:

1. the prevalent users of these contexts, ie the residents, mostly elderly, clearly express housing needs which should correspond to new performance of the built environment;
2. the intervention to counteract the abandonment of these places, at the same time, must be based on the maintenance of those architectural, identity and cultural characteristics capable not only of making these places unique for the tourism sector, but also and above all to revitalize a local economic-productive fabric and facilitate the recovery of the building heritage in terms of accessibility, inclusiveness and comfort, optimizing living spaces by type of user.

The theme entails the need to bring into play specialized skills relating to different disciplines both from a technical point of view (technological, structural, reading of materials and decay) but also from a historical and social point of view. The disciplinary contribution of the DAD department has above all seen the involvement of researchers active in the field of intervention on the built and on the territory.

With the initiative of the conference, first, and the volume, then, we also emphasize the urgency and need for action with respect to this problem by creating synergy and putting in place all possible initiatives. The need to intervene as soon as possible on this complex problem is not only an Italian requirement but is a reality of the whole Mediterranean, as, in fact, some essays included in this volume testify. It is therefore an important opportunity for reflection and deepening on a process that cannot and must not be considered irreversible. The reflections of these scholars from various geographical and disciplinary backgrounds can in this regard constitute a valid point of reference for outlining new paths and creative solutions.

Costanza Milani
Direttrice dell'Istituto di Scienze del Patrimonio Culturale, ISPC-CNR, Italia

The Institute of Heritage Science was pleased to participate in the organization of this conference on the theme "Villages and neighborhoods at risk of abandonment". It is a common theme in many Mediterranean towns/hamlets. The progressive abandonment of inland regions determined by numerous factors, the most important is transformation of the production cycle that bring to the state of abandon of the subsistence agriculture practice. This has given rise to a profound transformation of the territories, landscape, architectural and cultural heritage environment with consequences often negative. Remaining on the theme of the architectural heritage, in the countries surrounding the Mediterranean the towns/hamlets are holders of numerous architectural, historical and artistic heritage assets and, thanks to the inhabitants who still live there, custodians of a patrimony of knowledge and traditions (the intangible patrimony) which has already been partly lost.

It is a heritage that has not yet been subject to homologation, extremely differentiated because strictly dependent on the material resources and environmental characteristics (climatic, morphological…) of each individual territory. Depopulation and abandonment, with the interruption of maintenance interventions, lead to a slow decay of the artefacts until their transformation into ruins. On the other hand, the absence of maintenance has preserved and maintains its authenticity. We are faced with two challenges: to make the smaller villages alive again for the conservation of the material and intangible heritage they represent but at the same time to manage their maintenance to ensure they remain authentic. This is what we hope for, as an institute that deals with the conservation and enhancement of the architectural and historical-artistic heritage.

The success of the conference, with the presentation of 87 communications representing 8 circum-Mediterranean countries, testifies to the interest in this theme, also taking into account the rediscovery of life in small villages favoured by the pandemic event that made us aware that many tasks can be performed remotely.

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Mounsif Ibnoussina
Secrétaire Général du Réseau RIPAM, Université Cadi Ayyad de Marrakech-Maroc

Depuis sa première édition en 2005 à Meknès au Maroc, les RIPAM (Rencontres Internationales du Patrimoine Architectural Méditerranéen), représentent un rendez-vous biennal incontournable pour les différents acteurs du patrimoine bâti méditerranéen. La dernière édition qui représente la huitième et demi édition a eu lieu en 2020, à Florence en Italie.

Les Rencontres Internationales du Patrimoine Architectural Méditerranéen (RIPAM) sont à la fois des rencontres et un réseau de personnes et d'institutions œuvrant à la connaissance et à la conservation du patrimoine architectural méditerranéen, elles contribuent à la préservation de l'identité historique et culturelle des peuples de la Méditerranée. Le présent livre de la huitième et demi édition des RIPAM dépasse ainsi le public d'architectes, de chercheurs, d'universitaires, d'historiens, de scientifiques, de conservateurs, d'artisans, etc., issus de pays et d'institutions du pourtour de la Méditerranée, à qui il est destiné. Il regroupe les travaux consacrés à l'analyse et à l'étude du très riche et très diversifié patrimoine architectural de la Méditerranée, à travers des approches pluridisciplinaires ; historiques, archéologiques, architecturales et techniques, etc.

Toutes les rencontres scientifiques et culturelles organisées au cours de ces dernières décennies par les RIPAMistes ont converti ce patrimoine architectural dans toutes ses formes et manifestations, en un élément porteur pour déterminer l'image d'un pays. L'événement scientifique ou culturel est ainsi devenu le scénario privilégié d'importants engagements en faveur de sa réhabilitation et donc de sa valorisation.

Partie essentielle de l'héritage culturel qu'a généré l'imaginaire collectif des peuples de la Méditerranée, cette richesse patrimoniale est représentative de l'état d'esprit qui a permis de l'édifier sur les rives sud et nord de la Méditerranée et qui doit permettre de la réhabiliter et de la préserver.

Les travaux d'analyse des caractéristiques ainsi que des typologies de l'architecture méditerranéenne, réalisés par les participants aux différentes rencontres des RIPAM, montrent que ce patrimoine vivant, puisqu'en grande partie habitée, a gardé la pureté de son caractère tout au moins dans les grandes cités de part et d'autre de la Méditerranée. Il est donc l'expression fondamentale de l'identité civilisationnelle des communautés de la région.

Au nom de tous les membres de notre réseau RIPAM, j'aimerais remercier de tout cœur toutes les personnes qui, à titre personnel ou comme représentant d'une des nombreuses

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institutions qui soutiennent notre organisation, ont contribué à la réussite de ces rencontres depuis leur avènement à Meknès (Maroc 2005) jusqu'à la dernière réunion tenue à Florence (Italie 2020).
Je vous suis reconnaissant d'y avoir si bien travaillé et je vous envoie mon plus amical souvenir.

Stefano Baccelli
Assessore alle Infrastrutture, mobilità e governo del territorio della Regione Toscana

The risk of abandonment and depopulation that countries and neighborhoods run is a crucial issue of this time. Understanding the causes and identifying possible strategies for managing the phenomenon is one of the central themes of the policies of the Tuscany Region. The opportunity offered by this beautiful and in-depth discussion that arose during the inter-national conference RIPAM (Rencontres Internationales du Patrimoine Architectutral Mediterranéen), of which we present the scientific contributions produced by the scholars who participated in the conference, confirms the need to indicate in urban regeneration, that whether it refers to inland or urban areas, one of the real themes of the restart after the tragic pandemic event. It is not a question of a simple intention, but a concrete and effective will. We have the tool for declining urban regeneration in Tuscany: the Recovery fund.

But we need ideas, functions and souls for our territories, to transform economic resources into possibilities for regeneration. To pursue sustainable urban development and improve the quality of life of citizens, the Tuscany Region has issued tenders for 10 million euros from which 31 municipalities have benefited.

The projects envisage both the functional redevelopment of buildings and degraded areas or in a state of neglect, and the enhancement of open spaces and urban connections. But also the recovery of heritage, the promotion of socio-cultural projects or professional start-up. We have put in place a real strategy for inland areas, through actions that aim to counteract the phenomena of aging and abandonment of territories.

However, I am strongly convinced that the real challenge is the quality of urban redevelopment. Efficient tools and economic resources are not enough: the real challenge is to combine all this with quality ideas because the purpose of urban regeneration is to improve the lives of people, of social relationships by putting the citizen at the center and making him a privileged user of places, cultural heritage of the territory as a whole.

The following acts are the contributions of academics, managers of cultural heritage, conservation and restoration professionals, conservation scientists, architecture professionals, urban planners who study, analyze and work on all fields of architectural heritage.

They are valuable and enlightening ideas, reflections, thoughts to outline government action in this field.

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Présentation

LA RÉGÉNÉRATION DES VILLAGES EST UN ÉLÉMENT D'UN PROJET DE CROISSANCE DURABLE ET ÉQUITABLE

Saverio Mecca
Università degli Studi di Firenze-Italia

Construction en pisé (©Erika Guidoni).

Les villages de la Méditerranée et le Green Deal de la Union européenne

La Méditerranée est la région de la diversité, de la variété et des différences. Son histoire nous raconte un processus continu dans lequel la géographie et les caractéristiques sociales, économiques et culturelles se reflètent dans le paysage dont les caractères sont le fruit des hommes plutôt que de la nature, et en cela ils expriment un code génétique commun.

Dans cet aspect méditerranéen, les différences ne peuvent être attribuées seulement au double schéma classique du clivage nord/sud, mais sont liées aux multiples facteurs qui expliquent le développement inégal entre ville et campagne, entre montagne et plaine, entre côte et arrière-pays, entre régions de la Méditerranée.

Mais ce sont les différences qui nous intéressent, car nous avons compris que ce sont elles qui nous unissent, qu'elles sont notre richesse.

A partir de ces considérations, placées dans le scénario de la pandémie d'aujourd'hui qui a mis le modèle de développement du XXe siècle en crise structurelle, il est nécessaire de repenser le monde, de construire une nouvelle vision consciente d'un équilibre entre les zones les plus densément peuplées et les espaces «intérieurs» de la Méditerranée.

Nous devons ouvrir un champ d'expérimentation sociale et productive qui rend les deux protagonistes, d'une renaissance culturelle et économique, qui agissent au nom d'une durabilité harmonieuse.

Une renaissance qui part des champs, des pâturages, des bois et des villages, d'un patrimoine séculaire de savoirs d'interaction équilibrée avec la nature, d'un patrimoine immatériel de gestion durable, de la biodiversité de la flore et de la faune, du paysage, de la gastronomie et du vin, de la culture qui rencontre la science et la technologie dans toutes ses articulations.

En d'autres termes, la crise pandémique nous pousse à une vision plus complexe et efficace du développement durable et de la régénération territoriale avec une nouvelle relation harmonieuse et dynamique entre les zones urbaines et les espaces «internes» basée sur le patrimoine architectural, urbain et paysager comme base de production du bien-être «vert et durable».

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Le Green Deal européen propose une réflexion et un nouveau scénario pour un projet concernant la Méditerranée afin de surmonter les défis du changement climatique et de la dégradation de l'environnement induits par le réchauffement globale. Il suggère à l'Europe et à la Méditerranée une nouvelle stratégie pour sa croissance dans laquelle :

- les émissions nettes de gaz à effet de serre ne sont plus générées en 2050;
- la croissance économique n'est pas dissociée de l'utilisation des ressources;
- personne et dans aucun endroit n'est négligé.

Le Green Deal européen nous propose l'objectif de transformer les problèmes climatiques et les défis environnementaux en opportunités pour l'ensemble de la société, en rendant la transition juste et inclusive pour tous.

Dans le cadre de l'objectif stratégique du Green Deal, il est nécessaire de monter un programme à long terme de réaménagement global et de sécurité du patrimoine urbain et territorial permettant d'assurer:

- Une amélioration de la sécurité sismique et de l'efficacité énergétique;
- une conservation et une mise en valeur plus efficaces du patrimoine culturel et architectural;
- une meilleure qualité de vie dans tout le système urbain et territorial.

Le patrimoine culturel matériel et immatériel entre fragilité et changement global

Le patrimoine architectural et territorial méditerranéen se caractérise par un risque sismique élevé déterminé par la sismicité d'une grande partie du territoire, ou plutôt par un danger et une exposition importants déterminés par le haut niveau d'anthropisation et par une vulnérabilité significative et différenciée du patrimoine architectural historique et urbain.

Les événements sismiques répétés et les effets météorologiques du réchauffement climatique, en mettant en évidence à la fois la fragilité et la vulnérabilité des zones internes, des territoires collinaires et montagneux, des bourgs et des villages et leur rôle stratégique sur le plan environnemental, culturel et économique pour l'ensemble du territoire, sollicitent aujourd'hui une réponse à une question essentielle:

Comment transformer un point de faiblesse en une force ?

La fragilité de nos territoires appelle une réponse technique et politique pour se fixer des objectifs complexes et ambitieux à travers de nouveaux projets territoriaux qui étudient

et valorisent les systèmes locaux, les économies et les communautés, les connaissances et les patrimoines matériels et immatériels.
La richesse, la complexité et la diversité du système urbain et territorial et du patrimoine culturel matériel et immatériel, architectural, urbain et paysager sont la valeur ajoutée, la force compétitive des espaces internes sur lesquels sera basé un projet de régénération.
Il est temps de consolider, dans la société et dans les administrations publiques, la certitude que seules la recherche et la conception harmonieuse et systémique, qui caractérisent l'architecture, peuvent assurer l'intégration des différentes dimensions de l'intervention de régénération du territoire et des sciences, technologies et professionnalisme nécessaires pour recréer une société durable et équitable, une nouvelle qualité territoriale architecturale et urbaine basée sur la richesse et la diversité du patrimoine culturel, architectural, paysager, urbain, monumental et vernaculaire, pour une nouvelle renaissance méditerranéenne.
Le principal facteur de risque de défaillance, tant sur le plan scientifique qu'opérationnel, est la réduction du réaménagement du patrimoine urbain des villages à la seule atténuation du risque sismique (prévu comme objectif prioritaire et global) ou à la seule dimension «technique» (géologique, hydraulique, botanique, énergie, etc.).
Une approche «orthopédique» partielle pourrait non seulement constituer un facteur de risque en soi, en termes d'atténuation de la vulnérabilité sismique réelle, mais conduirait à un appauvrissement de la valeur du patrimoine architectural, urbain et territorial, en termes de qualité globale, de diversité culturelle, patrimoine immatériel et de son authenticité.

Conditions et potentiel

Au fil du temps, les territoires des villages ont subi une marginalisation croissante touchés par l'abandon et le dépeuplement, au point d'être rendus plus fragiles et vulnérables, comme en témoignent les nombreuses catastrophes naturelles qui ont frappé les territoires méditerranéens.
C'est une situation qui nous rend bien conscients de la nécessité et de l'importance des nombreux et divers domaines de recherche impliqués, qui concernent des profils de vie déterminants, liés au bien-être et à la santé des citoyens, au développement économique et social des territoires, aux infrastructures matérielles et immatérielles pour l'avenir des jeunes et des générations à venir.
Sur le plan scientifique et de la planification, une vision globale multidisciplinaire de la durabilité est nécessaire qui intègre le développement économique basé sur les nouvelles chaînes agro-forestières-pastorales, sur la production de ressources et d'énergie renouvelable et l'amélioration de l'équilibre hydrogéologique, de la sécurité, de l'efficacité énergétique.
Les immenses richesses environnementales, naturelles, sociales et culturelles, en partie non

encore perdues, représentées par les villages abandonnés, sont largement préservées dans les zones rurales et montagneuses et permettront aux pays méditerranéens de faire face aux défis qui nous attendent dans un avenir proche, si plein d'inconnues inquiétantes.
Les domaines de recherche, de formation et de transfert sont à la base des processus d'innovation et de développement entrepreneurial:

- La construction de modèles numériques jumeaux des territoires et villages pour la gestion des données territoriales produites par les observations satellitaires, les don-nées produites par les recherches, et celles qui seront produites par les territoires eux-mêmes;
- Le déclenchement d'un processus systématique de développement, de transfert, de communication, de socialisation et de mise en œuvre de la recherche sur le patrimoine culturel, architectural, urbain et territorial, et en particulier des spécificités constructives et architecturales ; l'expérimentation des meilleures pratiques de conception de la régénération et de la sécurité en une seule dimension de formation de nouveaux professionnels et de qualification des professionnels existants, de planification et de gestion, de partage social des connaissances ;
- un processus systématique de développement, de transfert, de communication, de socialisation et de mise en œuvre de la recherche sur le patrimoine culturel agrno-mique et forestier et sur les chaînes d'approvisionnement alimentaire, agroalimentaire et artisanal nécessite également un processus similaire et coordonné;
- un processus systématique de développement, de transfert, de communication, de socialisation et de mise en œuvre de la recherche sur les stratégies de gestion des processus d'innovation et de création d'entreprise.

Au centre des contributions rassemblées dans ce volume se trouvent des lieux et des territoires complexes qui préservent encore les identités culturelles et l'intégrité environne-mentale dans les pierres, au point de représenter un lieu de bien-être pour les citoyens des centres urbains et des zones périurbaines et, dans la crise pandémique, un nouveau lieu de vie avec une relation différente avec la nature et avec soi-même.

Territoires résilients pour construire l'avenir

Des territoires résilients pour construire l'avenir dans les temps difficiles, des espaces propices à la reconversion écologique des pays méditerranéens, des lieux idéaux pour l'élaboration de bonnes pratiques pour un développement responsable, pour une économie circulaire où les enjeux de la transition énergétique et de la production des biens et services environnementaux ne sont pas en opposition, là où l'empreinte écologique de la présence anthropique est effectivement durable.

Dans cette vision stratégique, alternative et dynamique, peuvent être placées les recherches et les réflexions suivantes, qui toutes s'inscrivent dans une vision holistique et intégrée indispensable à la lecture des phénomènes territoriaux, pour leur compréhension et la formulation de scénarios futurs.

Un seul exemple : une sensibilité accrue aux valeurs territoriales, également par une nouvelle demande touristique, est à la base du développement du géo-tourisme : une forme de tourisme qui soutient et valorise le caractère géographique, le paysage physique et culturel d'un lieu, son environnement, ses caractéristiques culturelles et esthétiques, son patrimoine et le bien-être de ses habitants, même temporaires. C'est un ensemble de patrimoines maté-riels et immatériels à appréhender dans leurs complexité.

Intercepter et satisfaire cette demande, c'est remettre les lieux au centre d'une nouvelle poli-tique territoriale, visant à développer des flux touristiques qualifiés capables de s'intégrer au développement territorial global, agricole, forestier, pastoral, industriel, touristique, culturel, résidentiel, qui voit l'implication de l'ensemble de la communauté qui représente un élément fondamental du développement du tourisme territorial.

Il est donc nécessaire de nourrir le territoire de connaissances en favorisant un nouvel entrepreneuriat local basé sur la recherche et la compétence technico-professionnelle, en accompagnant de nouvelles personnes qui décident de vivre et d'investir dans des territoires à faible densité, et qui sont capables de récupérer et de réinventer les traditions et en même temps de garantir les relations avec les zones urbaines et les centres d'innovation, pour comprendre le sens des lieux et leurs ressources, les valoriser et ne pas les consommer.

Cultures pour la conservation et la valorisation du patrimoine à risque d'abandon en Italie

Marco Abbo
Geologist, freelance Sanremo, Italia

Francesca Luisa Buccafurri
Architect, freelance, Ospedaletti, Italia

The Cenova Oratory (Rezzo, IM) overwhelmed by a mudslide which caused the central portion collapse (December 2019).

Among the many causes that lead to the abandonment of inhabited centers, the hydrogeological instability is often misunderstood or in any case is not addressed in its multiple aspects, linked to the formation of the agglomerations which today threatens. The mountain territory is by definition "at hydrogeological risk", where intrinsically the dangerous factors are maximized.
The contribution analyzes Val Nervia, in the far western Liguria near the border with France, proposing an intervention approach that takes into account not only safety and conservation, but also essential strategies of resettlement which necessarily pertain to the categories of creation.
This appears to be the central theme: whether the conditions for resettlement still exist or whether it is necessary to re-invent them. "*Because construction will not gain its new legitimacy by neither copying or remaking the objects of the past but continuing to invent*" (Choay, 1992, pp.167-168.).
Only new forms of human settlement and new landscape entities, likely to offset the unstoppable current breakdown, can inscribe the historical heritage within a double strategy of memory and creation.
"*Having said that, it is useless to establish whether Zenobia is to be classified among happy or unhappy cities. It is not in these two species that it makes sense to divide the cities but in two others: those that continue through the years and the mutations to give shape to desires and those in which desires either manage to erase the city or are erased* " (Calvino, 1993, pp.34-35.).

Keywords: hydrogeological risk, heritage, abandonment, memory, resettlement

The territorial control (a false myth?)

The hydrogeological instability is a topic of particular relevance for Italy, above all due to the insane increase in urbanized areas, which occurred starting after World War II when the artificial surfaces went from 2.7% in the 1950s to 7.65% of 2017.
The figure is even more impressive when we consider that these surfaces thicken and reach paroxysmal levels right around the large production centers, with local percentage incidences which are much higher than the "spread" figure at national level.
Nevertheless, the classic iconography of hydrogeological instability identifies too simplistically the abandonment of rural and mountain areas as the main cause of the general hydrogeological instability: the lack of protection and maintenance of the territory would therefore generate, by themselves, those landslides which directly affect the inhabited centers, or improperly "arm" river floods, making them increasingly destructive as they reach the "citizen" valley floor.

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The characteristic village of Castelvittorio, perched on the morphological watershed to guard the ridge paths. The steep ridge is none other than the fault mirror of the Soarge-Taggia tectonic line.

According to this nostalgic vision, which is very reminiscent of the longing for the lifestyle of the Rousseau good savage and the repudiation of the inevitable corruption linked to civilization, the hydrogeological instability would derive exclusively from the abandonment of the territory and, in particular, from the lack of maintenance of the defenses of the slope and of what remains one of the most immense works of transformation of the territory carried out by man in all times: the maniacal, meticulous and integral reconstruction of the slopes according to cultivable terraces, whose realization over the centuries hides - spread over the vastness of the territory - a much greater effort than the construction of the pyramids.

However, it has been shown (A.A.V.V., 2011-2013) that the hydrogeological "flywheel" action, ie the attenuation of the amount of rain that transforms into erosive surface runoffs, and which acts in the presence of terraces, is less than the same role played by the pine forest: this means that a fire has a multiplier effect of hydrogeological instability much greater than the progressive decay of abandoned terraces.

Again: from an "energetic" point of view, it rains more in the mountains, the greater slopes favor higher water flow speeds and greater erosive power, acting on steeper and potentially periclining slopes: it therefore appears undeniable as the hydrogeological instability of rural and montane areas is a pre-existence, *totally independent from the activity of "territorial defense"*, which remains a fascinating but totally abstract concept.

View of the Castello Doria in Dolceacqua, guarding the road network at the bottom of the valley, but exposed, with varying degrees of risk, to the floods of the stream (see picture.4).

Fault mirror above the Pigna village (Giammarino, S. (2010). Note illustrative della Carta Geologica d'Italia. Genova: Regione Liguria - IspraServiziogeologicod'Italia).

Excerpt of the hydraulicriskmap in the town of Dolceacqua, Liguria Region, Nervia River Basin Plan.

The mountain villages, in fact, historically do not "preside" or substantially modify the territory, but rather insinuate themselves timidly and to a limited extent into the geomorphological context, where small stable islands can be established, "forcing" the context to a limited extent only for essentially strategic reasons and military to which subsistence economies and inhabited areas have overlapped over time: that is, settling on areas at hydrogeological risk (presence of overhangs or floodable areas) as they are more defensible or strategically located. In this there is an adamantine intelligence, which today is called "risk management", preferring survival to the enemy - more urgent and concrete - to a possible, but more abstract - exposure to the risk of landslide or flood.

There remains the fundamental figure consisting of settlements which adapt to the conditions of the territory and which do not substantially modify its characteristics, unlike what happens for the arrogant coastal cities, which instead distort the territory by occupying it as enemy troops.

The mountain territory is therefore by definition a place "at hydrogeological risk", where intrinsically the dangerous factors are maximized and the only form of "stable" settlement (and therefore of possible management of the consequent risk), is represented by the limited building in few "happy islands" according to a single rule: *moderation*.

View of the valley area with the orography and hydrography of the characteristic shape highlighted: the large catchment area of the mountain connects to the sea along the relatively thin valley of the Nervia stream. Also highlighted is the direction of the Saorge-Taggia tectonic lineage (right transient fault), origin of most of the earthquakes in Western Liguria (image processed by Google Maps).

The same historical building, from the terracing of the fascia to the structures of the buildings, reflects a concept of *deformability*, of *adaptation*, opposed to the hard approach of post-industrial materials, which is *opposed*, which *resists* stress, with all its modern *hybris*. These are the "happy islands": places where an incessant daily effort (but let's not call it a preside) tries not to succumb to Nature.

The mountain is a demanding but often hostile guest, perfectly tracing the common etymology of the two words (from the Latin *hospes-hostis*).

Val Nervia (the case report)

Val Nervia, near the Ligurian border with France, extends between the Ligurian Sea and the southernmost slopes of the Alps (Monte Toraggio and Pietravecchia), passing from zero to over 2000 m in less than 23 km in air line.

From the mild riparian climate, we therefore pass to a mountain environment, only slightly tempered with respect to the typically alpine rigors, to be crossed in all its intermediate nuances, enclosed between minimum spatial distances.

From the point of view of the landscape features, specialized agricultural crops, olive groves and vineyards dominate the **valley floor**; in the more steep areas and with less

favorable exposure, there are strips of pine forest and mixed forest. The settlement systems made up of scattered and heterogeneous settlements with two main aggregations: Camporosso with linear development and Dolceacqua in part linear and in part polarized.

The **Middle Valley** characterized by a greater breadth than the deeply engraved confluent valleys of the Bonda, Vetta and Merdanzorivers. The limited agricultural crops, located on the areas contiguous to the inhabited areas, are contrasted by extensive wooded areas with a dominance of broad-leaved trees locally interspersed with submontane grasslands; the large extension of wooded areas covers over 70% of the territory. The settlement system essentially consists of medium-density, continuous and homogeneous aggregates, including Isolabona with "a castramento" development, located in the valley floor and Apricale and Baiardo, with linear development on secondary ridges.

The **Upper Valley**, on the other hand, is characterized by some natural features of exceptional value, such as the hydro-geographical system at high altitude, an imposing karst system, overhangs and rocky outcrops. The vegetation has characteristics of absolute importance in which the contiguity of ecologically very diversified situations is highlighted: there are, on the one hand, vineyards, olive groves, chestnut trees and holm oaks (between Castelvittorio and Colle di Langan), on the other mixed mountain forests with extensive larch woods, rhododendron patches, subalpine meadows with typical alpine pastures and rocky vegetation that hosts endemics of international interest. The settlement system is essentially made up of aggregates with polarized development from aggregates with polarized development and high density, continuous and homogeneous of which Pigna and Buggio on the slope, Castelvittorio"di poggio".

In the historical chronology of the formation of the communication lines, the model of the district is based on a ridge organization which is the original matrix of the infrastructural phenomena of the whole territory.

These orographic lines originating from the nodes of Clapier and Marguareis, on the main Alpine watershed, represent the geographical setting of the Ligurian populations Intemelie, borders, communication routes and very often locations of settlements as documented by archaeological and speleological findings.

The coastal route will become a communication line stabilized only in the Roman period, then abandoned for more than a millennium after the fall of the Empire and its military protective force, favoring the development of diagonal routes from valley to valley and the same valley routes on the traces of lines of penetration linked in the past to the territorial expansion of the Roman municipality.

View of the valley area with the orography and hydrography of the characteristic shape highlighted: the large catchment area of the mountain connects to the sea along the relatively thin valley of the Nervia stream. Also highlighted is the direction of the Saorge-Taggia tectonic lineage (right transient fault), origin of most of the earthquakes in Western Liguria (image processed by Google Maps).

The ancient thermal baths of Pigna (Archive of the Pigna Museum).

"In this context of events that alternate the development or contraction, stabilization or abandonment of the itineraries, there remains the surprising constancy, protracted almost until the contemporary era, of the high routes of transhumance, which in the same mountains towards the Nervia, Roia, Argentina, Arroscia and Tanaro link the profound contents of a pastoral world, which overcomes contingent political and administrative events, with more complex and lasting community of life and traditions" (Stringa, 1977, p. 14.).

The valley, despite having fascinating and semi-deserted dirt roads connecting it, is not a priority transit route to Piemonte.

The **demographic and territorial data** highlight in particular:

- the phenomenon of depopulation: the current population is about one third of that present in 1861, with a density of less than 20 inhabitants per square kilometer, with the exception of the valley floors of the municipalities closest to the coast;
- the presence of evident signs of abandonment over large areas of the territory, due to the decline in farms;
- a high rate of early school leaving / drop out;
- the presence of a percentage of foreign EU citizens higher than that of similar contexts, which has led, in particular in the second-tier municipalities, to a widespread recovery of the historical housing heritage.

In the face of these data, the episodes aimed at relaunching or innovation are rather contained and isolated and not yet able to significantly reverse the trend towards abandonment.

It seems necessary to mention the parable of the Pigna thermal baths, which after hosting up to 3,000 guests per season from 1954 to 1989, including the tenor Di Stefano and Princess Grace, closed the business.

On June 25, 2000, the reopening of a renovated structure did not follow an evident success, where the only treatment and wellness center resulting from daily attendance, is not enough to support the hotel sector, which is often deserted. The plant, which has been

The Pignaschi fountain (Poggi, M. V. (2012). AIGA. Finale Ligure: CAI Finale Ligure - www.digilands.it.

auctioned several times, was recently purchased by a foreign consortium that is outlining its relaunch.

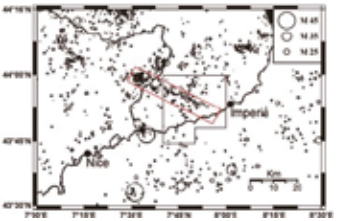
Pigna thermal baths

The fortune of Jungian theories is mostly linked to the strength of archetypes, a sort of dominant symbols or universal forms of strong suggestion, endowed with a strange ubiquity that, through the continuous re-birth in each individual brain structure, allow the preservation of spiritual human hereditary mass, pure thought condensed in the fascinating form of the collective unconscious.

A powerful archetype underlies the immediate charm of the town of Pigna, made up of the power of Mother Earth - Gea, the first goddess after Chaos - made manifest in the large fault mirror that overlooks the town of Pigna and which makes thermal events possible along the underground ducts created by the typical karst of the upper Nervia valley.

As with all thermal events, the telluric and terrifying power manifests itself in a quiet warning consisting of the emergence of hot springs, through the passage of waters into the underworld, consisting of an inaccessible network of paths that magically connect distant places.

The double presence of the karst network and imposing tectonic phenomena, constituted by the Saorge-Taggia lineation, allows the waters to take on the sulphurous residues and heat of the underworld as they pass through the underground world, bringing to light the faded demonic traces.



Detail of the nummulitic limestones formation.

The Saorge-Taggia tectonic lineation (right transcurrent) and the distribution of instrumental seismicity from 1983 to 1999. (Giammarino, S. (2010). Note illustrative della Carta Geologica d'Italia. Genova: Regione Liguria - Ispra Servizio geologico d'Italia).

From the sedimentary rocks of calcareous nature (Calcari a Nummuliti Eocene-Lutetian 48-40 million years ago) which make up the grim forms of Mount Toraggio we move on to the more recent cover of the Flysch, a weak and complex formation, extremely landslide and changeable.

Here, therefore, explained the contrasting characteristics of the landscape, steep and bare and at the same time landslide and wooded, with resurgences of cold crystalline water, but also of hot and sulphurous thermal scents.

The beauty of the places, the variety of its climate and landscape, the wines and the food offer in general, the oxymoron of living in the mountains with full sea views, have inevitably attracted small groups, especially foreigners, who give life to occasional restructuring, partial resettlement, unfortunately too messy and discontinuous like the sudden loves that generated them.

Too little to bring about a definite turnaround.

More interesting is the proposed relaunch action for the Pigna thermal baths, which would constitute an "elitist" operation but with interesting effects on the valley tissue.

The attraction of huge resources could in fact favor the influx of high-profile tourists, to which the offer of high-quality and certainly high-cost products present in the valley, precisely falling within the food and wine and agricultural sectors, as well as pure and simple enjoyment of the landscape, emerged and underground.

In other words, the only economically sustainable alternative to a marginalization of local products, obviously not competitive on a global scale, is certainly not the increase in production and the lowering of costs, but exactly the opposite, namely the "forced quota" and its high quality certification for selected customers.

Where by product we also mean a stay experience in parceled structures such as the widespread hotel.

It is not so difficult to imagine, in the post-Covid reality, even some definitive transfers, for those who can afford remote work, where the IT infrastructure costs of the valley progressively decrease in the competitive regime operating on the market.

It is clear that the initiation of such a process, within the limits defined by a strict ban on expansion, should be appropriately supported at a regulatory and administrative level, with appropriate tax exemption policies and incentives for a green renovation of the inhabited areas. There is therefore a possibility, to be seized without further consumption of the territory and reasonably sustainable from an ecological point of view, to defend the particularity of the territory: something which is not like everything and cannot be for everyone.

Diachronic and synchronic time

There are two gifts that should always be given to children: a magnifying glass and an astronomical telescope, so that they discover that their world - already so rich - can contain secret surprises, new dimensions hidden in the infinitely small and in the infinitely large.
Everything changes according to the point of view from which we place ourselves.
The recovery of historic centers and the Ligurian hinterland cannot be an operation limited to the single village, even when it has exceptional historical, social or economic characteristics.
In fact, the Ligurian morphology is certainly marked by the physiological contrast between the coast and the hinterland, but above all by the equally characteristic isolation of the individual valleys: the mountains surround the shoulders and the sides of the valley, the coastal-tourist-holiday conurbation often physically obstruct it. the foot and the outflow towards the sea.
Any restoration work aimed at recovering abandoned villages must therefore conform **to the dimension of the valley**, which constitutes the unitary geo-morphological element, just as the walls were the *architect's urban unit.*
In chess *"The respective value of the pieces depends on the position on the chessboard, in the same way that in the language each term has its value for the opposition with all the other terms"* (Saussure, 1916). In other words, in the game of chess the importance is not predefined in the piece itself, but by its position on the board: pawn and queen can be equally decisive, and all the pieces together must contribute to the salvation of their king and the destruction of the enemy king.
The valley is the chessboard in which the individual villages "move", some majestic, others more humble, but all connected. The selective redevelopment of a single village, because it is particularly (or arbitrarily) fascinating, resembles playing chess by moving only the queen: a playful suicide.
Going from the point of view of the single village to the unitary vision of the valley, involves an evident difference in the strategic choices linked to usability and mobility: not towards the single village, but *along* the whole valley.

The need for services (car parks, hospitals, schools, administrative structures, etc …) where functional to the entire valley, has the possibility of rational distribution with respect to the parcelling out on individual villages, as well as allowing to differentiate attention and solutions based on tourist and agricultural propensity , residential and productive of the different nuclei.

This change of perspective is similar to the Copernican revolution introduced by de Saussure in linguistics, which overcomes the approach based on the evolution over time of single words (*diachronic axis*), preferring the study of the reciprocal relations of words in a given period of time (*synchronic axis*): "*So when with a move we move only one piece on the chessboard* (diachronic event, that is the evolution of a word towards new sounds or meanings), *with this we have modified the whole value system of the pieces, that is determined a different synchronic situation*" (Tarca, 2020). While the *meaning* (the underlying concepts, the sound of the word, the shape of the sign) is very relative and changeable, the relational structure that makes the single words *meaningful* responds to the universal neurobiological structure of the brain, which underlies the different languages of the world.

"*We don't see the light. We only see the effects it has on objects. They only know of its existence because it is reflected by what it encounters on its way, thus making objects visible, which otherwise we would not see.* ***So a nothing, illuminated by another nothing, becomes something****. Words work in the same way: they have no content in themselves, but if they meet someone who listens to them, they become something. Analyzing language is like analyzing light, we are in the same condition: we learn to recognize that what is flowing under our eyes at the moment makes sense only because our brain is built to understand sentences as instructions to produce meaning. ; not because the meaning resides in the sentences*" (Moro, 2010).

As in language, therefore, every resettlement strategy must be placed within a unitary chessboard, constituted by the valley, avoiding distorting its significance, in the way in which enhancing must not mean making it *easily usable*, but on the contrary making it more expensive and exclusive, whereas a simple enhancement in terms of tourism and hospitality would be nothing more than an extension of the coastal "model" also to the hinterland.

Here the "elitist" character of a possible path of recovery of abandoned centers is emerging, where it, due to the nature of the places and spaces, cannot respond to a *mass industry*, if one wants to respect the "synchronic" makes the small village what it is: a place for a few. But this is only the first step: if we stop at this we can sell to some rich merchant not only the Gallinara Island, but also entire valleys and see them transformed into sumptuous

fortified enclaves open to a select few, as luxury holiday districts open a few days a week: perhaps beautiful, but dead, extraneous, in the sense of situated outside the community.
In order for them to truly return to life, a stable, economically sustainable and environmentally bearable, reasonably open and dynamic settlement is necessary.
The forms and ways in which these communities can return to exist and develop are the most diverse and unpredictable, just like the development of language in the Saussurian diachronic process.

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LE MUSÉE DIFFUSE: STRATÉGIE POUR VALORISER LES VILLAGES À RISQUE D'ABANDON. L'ÉTUDE DE CAS DE PITIGLIANO ENTRE PATRIMOINE MATÉRIEL ET IMMATÉRIEL

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Thèse de Master en Architecture avec projet de réaménagement de Poggio Strozzoni. Au nord le centre culturel de San Francesco et au sud le centre multifonctionnel de Rocca Strozzoni et Parco Orsini (Lecci, Pasqualotti 2019).

The diffuse museum represents a model for enhancing the tangible and intangible heritage of a place that finds its fortune in the quality of being able to overcome the classic idea of a museum by projecting itself into a dynamic system of participatory experiences on the territory. This model allows to trigger the processes of revitalization of the social and economic fabric that produced it, overcoming the action induced by its constitution and pro-actively branching its effects to the whole community that preserves and constitutes it. So, this model becomes a strategy to counter the phenomenon of depopulation of the smaller towns which are slowly becoming depopulated since the Second World War onwards.
The text presents the case study of the "Widespread Museum" project of Pitigliano started through a scientific collaboration between the local Diocese and the University of Florence. The revitalization of the village is developed through three university missions structured in the project: the study, the research and the cultural enhancement. Overall, the entire action contributed to rekindling the scientific debate on some issues related to the enhancement of the village's historic monuments and the enhancement of some services (important steps in the proposed reorganization of the new museum model). This action was also able to address the important issue of cultural dialogue in the Mediterranean area and that was a fruitful opportunity to feed the process of awareness of the premises themselves.

Mots clefs: musée diffuse, Pitigliano, patrimoine matériel, patrimoine immatériel, villages sous menacés d'abandon, troisième mission universitaire.

Introduction

Le phénomène de l'abandon des zones périphériques au profit des centres urbains représente un processus historique et dynamique qui trouve ses origines dans l'histoire de la naissance des villes depuis la révolution néolithique. Au fil des siècles ce phénomène a toujours reflété la tendance à identifier les zones densément peuplées comme symbole du bien-être d'une civilisation.

Cette croyance est facilement compréhensible si on considère la ville comme un lieu complexe capable de satisfaire plus facilement les besoins de la communauté qui l'habite. La centralisation des services, la variété des offres de travail ou de loisirs, la facilité de répondre à un besoin ou le partage d'un système social dynamique ont toujours représenté un modèle gagnant, surtout aux yeux des jeunes. Vouloir intervenir sur le phénomène d'abandon des petits centres, ça veut dire donc aller identifier quelles actions stratégiques peuvent

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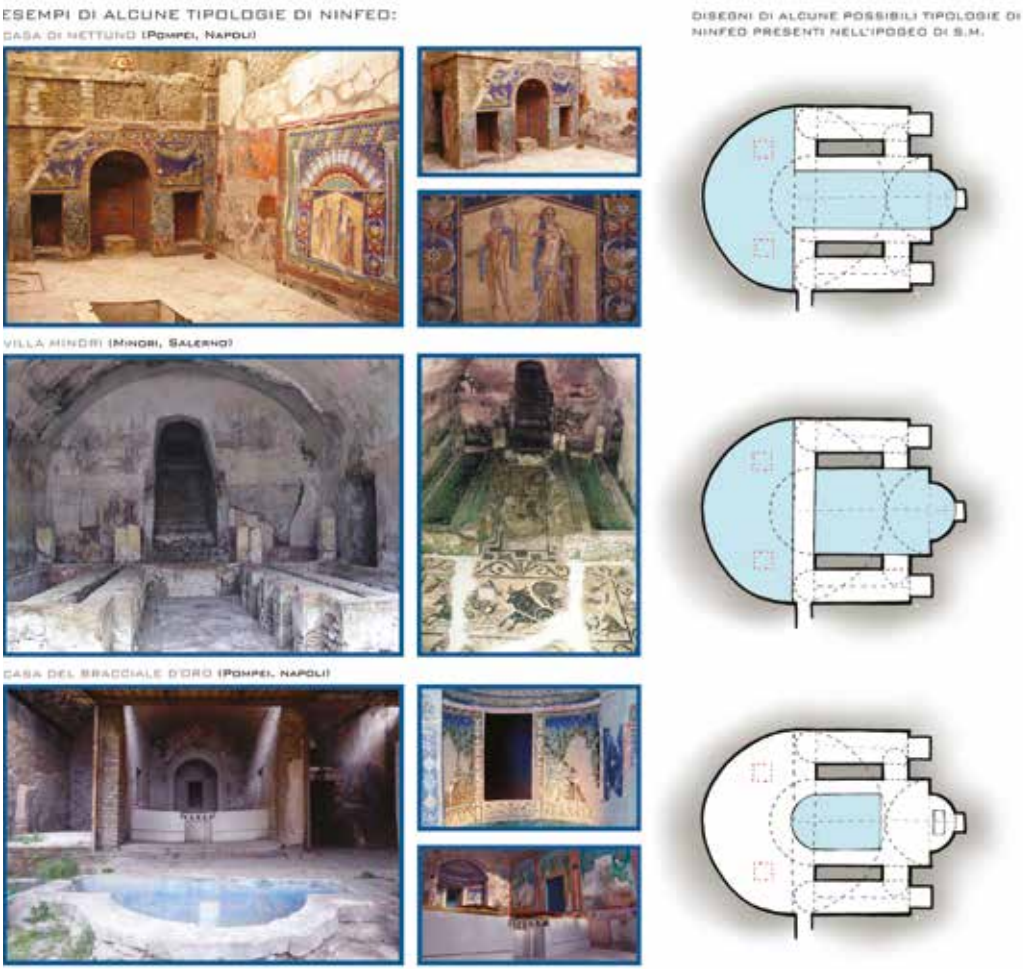


Hypothèses comparatives entre certaines structures spécialisées du nymphe et les observations faites sur les levés électromagnétiques réalisés en 2016 (Rivetti 2018).

déclencher ces mécanismes sociaux capables d'opérer un retournement rendant l'offre des centres urbaines les plus petits, qui sont aussi plus ~~plus~~ compétitive que les grandes villes en termes de bien-être.

De façon diamétrale donc, cette recherche se concentre sur les centres mineurs comme gardiens d'un autre bien-être dans lequel les rythmes de vie ralentissent au profit d'une qualité de vie différente.

Dans ce contexte, l'identification des bonnes stratégies pour valoriser les petits villages du territoire italien devient cruciale pour l'entretien ou la revitalisation des petits centres urbains.
La recherche que nous présentons ici est structurée à partir d'une collaboration scientifique commencée en 2017 entre l'Université de Florence et le diocèse de Pitigliano.
Le projet initial visait à valoriser certains atouts architecturaux présents au sein du diocèse à travers l'étude approfondie des différents thèmes qui se fondraient dans un réseau d'offres englobant l'ensemble du territoire, créant un système muséal généralisé capable de concurrencer l'offre touristique de la métropole toscane la plus proche.
Il s'agit par essence d'un projet requis par la volonté d'élargir les connaissances sur certaines problématiques spécifiques et de renforcer un système territorial secondaire par rapport aux grands centres urbains environnants : un territoire riche en histoire et en ressources mais moins attractif en présence des grandes villes d'art.

'Inners Area'

On souligne que Pitigliano est situé dans ce qui est défini comme la zone du « Tufo », un territoire qui jouit d'un rôle historique important depuis la période étrusque, mais qui aujourd'hui, avec des événements alternés, a perdu son rôle central avec des répercussions importantes soit sur le plan social soit sur l'économie.
À partir des analyses réalisées par l'ISTAT[1], on peut observer comment la population toscane a suivi une augmentation démographique depuis la fin du XIXe siècle et une baisse seulement depuis les années 1990. Dans ce scénario, Pitigliano enregistre une diminution démographique déjà à partir à la fin de la deuxième guerre mondiale (De Rubertis, 2019, 71-96).
Au niveau régional, ce phénomène correspond à un abandon global des petits centres au profit des grands centres urbains. Cette tendance est emblématique pas seulement de la région couverte mais aussi on identifie une tendance commune à l'ensemble du territoire italien ; c'est pourquoi depuis 2012, le Département du développement et de la cohésion économique (DPS) du gouvernement italien a commencé à développer une '*National Strategy in favor of Inner Areas*' (Lucatelli, 2014) contenant des mesures de sauvegarde et de prévention pour contrer ce phénomène.
On peut lire, tel que précisé au paragraphe "Nota metodologica per la definizione delle Aree Interne" dans le DPS 2018:

[1] Cfr. Indici demografici e Struttura di Pitigliano < https://www.tuttitalia.it/toscana/67-pitigliano/statistiche/indici-demografici-struttura-popolazione/> (09/20)

Hypothèses comparatives entre certaines structures spécialisées du nymphe et les observations faites sur les levés électromagnétiques réalisés en 2016
(Rivetti 2018).

> Il n'y a pas de correspondance nécessaire entre la dimension «physique» du centre et la capacité d'offrir certains services […]. L'identification des pôles dans les communes qui offrent un ensemble spécifique de services, qui deviennent donc de véritables attracteurs comme alternative à la simple dimension «physique», semblait alors la meilleure voie à suivre, avec toutefois le rapprochement nécessaire inhérent à la sélection des services pris en considération. Dans le choix effectué, le critère de la dimension urbaine, approchée par la taille de la population, a été remplacé par celui de la dimension «ville» qui regarde la capacité des centres à être "inclusifs" au sens social et donc à transformer le simple habitant en citoyen. Cette approche, abandonnant la contrainte donnée par la taille en termes de population, a permis d'une part d'identifier des centres, même petits, mais équipés de tous les services choisis et d'autre part d'appréhender, également dans ce cas de manière approximative, le phénomène intercommunalité, c'est-à-dire la capacité des municipalités à se mettre en réseau en partageant les services (DPS, 2018, traduction de l'auteur).

Selon ce critère de sélection, c'est clair que les indicateurs retenus représentent déjà la trame stratégique sur laquelle travailler pour transformer un "inner Areas" en "pôle".
De ce point de vue, Pitigliano et la commune intercommunale offrent un excellent banc d'essai pour tester l'efficacité de stratégies spécifiques visant précisément à accroître l'inclusion sociale et la création d'un réseau intercommunale de services / offres.
On a donc été décidé d'adopter le concept d'un musée à grande échelle comme stratégie clé. Le choix de se baser sur ce modèle dépendait de la valeur intrinsèque qu'implique ce type d'offre. En pratique, il s'agit d'un système qui, en plus d'offrir une plateforme structurée pour l'utilisation de tous les actifs matériels présents dans la zone (urgences architecturales, petits musées, beautés paysagères), permet aussi à la communauté présente dans la zone de devenir partie intégrante du projet lui-même tel qu'il représente propres traditions et racines (actifs immatériels).
Il est apparu que cette stratégie a permis, de manière conséquente, de structurer une série d'activités qui ont jeté de manière généralisée les bases de la consolidation de l'intercommunalité territoriale et du lancement de ces processus de développement économique inclusifs visant à déclencher cette revivification espérée, se plaçant ainsi contre-tendance au phénomène de dépeuplement des petites villes.
Après avoir fixé les objectifs principaux, l'équipe universitaire engagée dans la collaboration a lancé une série d'activités liées aux trois missions universitaires: l'enseignement (première mission, qui repose sur l'interaction avec les étudiants), la recherche (deuxième mission, principalement en interaction avec communautés scientifiques ou pairs) et la soi-disant 'troisième mission' (c'est-à-dire ce système d'activités lié à la valorisation culturelle, sociale et économique des connaissances) (Blasi, Romagnosi, 2013).

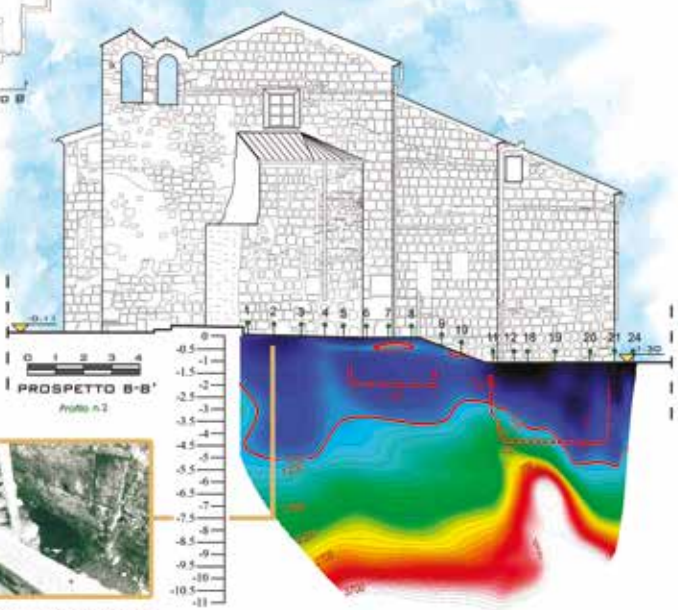
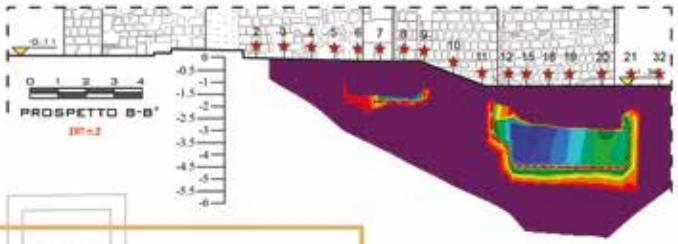
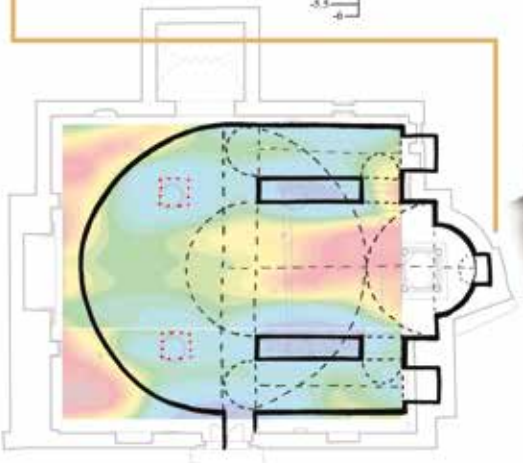


FOTO SCATTATA DALLA SOVRINTENDENZA DI GROSSETO A SEGUITO DEI LAVORI DI RISTRUTTURAZIONE DELLA CHIESA DI SANTA MARIA ESEGUITI IL 31/10/84. DURANTE LO SCAVO DELLO SCANNAFOSSO È STATO RINVENUTO ALL'ESTERNO DELLA CHIESA NELLA PARTE ABSIDATA UN ARCO VUOTO.





IPOTESI SOVRAPPOSTO ALLA PIANTA ATTUALE CON L'INDAGINE ELETTROMAGNETICA, IN SCALA 1:100.

VISTA ESTERNA DELL'ABSIDE DI S.M.

La première mission universitaire

L'ensemble du processus cognitif est devenu une partie intégrante du processus de revivification du village lui-même. Depuis 2007, Sovana et Pitigliano ont accueilli des classes entières de la faculté d'architecture de Florence, ce qui a amené leurs programmes éducatifs hors des murs de la faculté.

Ces épisodes ont été la première occasion pour les enseignants et les étudiants d'entrer en contact avec la réalité locale et de vivre tout ce que le territoire pouvait offrir au visiteur. La visite des monuments principaux, le Palazzo Orsini avec son musée diocésain, la synagogue juive, les églises médiévales, les grottes étrusques et les paysages de contes de fées, a immédiatement mis en évidence la riche stratification historique que le site offrait. Cela a permis aux jeunes étudiants du cours de Dessin et du cours de Projet de travailler dans un environnement stimulant et de vivre une expérience immersive bénéficiant d'un enseignement soit «actif-opérationnel» soit «heuristique ou de recherche», en appliquant leurs connaissances théoriques pour acquérir des compétences pratiques dans le domaine de la profession.

Ces activités ont été des opportunités qui ont permis aux étudiants de se passionner pour le sujet et de développer des thèses et des propositions de projets qui, bien que théoriques, offrent un moment important de réflexion hautement qualifiée sur les possibilités de développement du système infrastructurel de la région (f.1).

Réciproquement, aussi les habitants du lieu se sont retrouvés à accueillir de grands groupes de jeunes étudiants universitaires qui ont envahi les rues de la ville avec leurs cahiers, dessinant et prenant note de toutes les données nécessaires au développement des tâches assignées, générant une saine curiosité aux yeux des autochtones investis, plus ou moins inconsciemment du rôle des propriétaires / détenteurs d'un actif matériel / incorporel de grande valeur.

La deuxième mission universitaire

Parallèlement à l'action didactique, on a lancé aussi une activité de recherche scientifique qui a permis d'alimenter le débat culturel sur certaines questions liées aux origines des principales urgences architecturales dans le territoire de Pitigliano et sur certains aspects qui ont caractérisé et qualifié ce centre urbain dans l'histoire.

Santa Maria a Sovana

Le premier thème ciblé a été l'église de Santa Maria in Sovana. L'ouvrage du XIIe siècle conserve à l'intérieur un ciboire en pierre préromane rare. L'état de la recherche fait

actuellement des hypothèses sur la genèse structurale du site. Avec les études (Rivetti, 2018) on a pu visualiser certaines données qui, à partir d'une analyse précise, ont permis de formuler des hypothèses spécifiques sur l'utilisation antérieure du territoire
En détail, on a examiné les documents suivants :

- Rapport technique 1984 de la surintendance des travaux de consolidation
- Tableaux d'enquête 2016 joints aux travaux de consolidation, de restauration et de mise à niveau de l'usine.
- Enquête géophysique 2016

Ces données, analysées selon une approche holistique, ont permis de progresser dans la recherche, atteignant le point de faire des hypothèses typologiques issues de la comparaison entre l'analyse tomographique et les types de bâtiments historiques connus. La relecture des données de 2016 a en fait ouvert des nouveaux champs d'investigation, parmi les principaux indicateurs, les analyses de type autopsie permettent de mettre en évidence des énormes infiltrations à l'intérieur de l'église et immédiatement à l'extérieur, suggérant la permanence d'éventuelles conduites d'eau liées à la présence d'anciennes usines spécialisées.
La réinterprétation des recherches géophysiques a mis en évidence une conformation particulière des zones de plus grande densité qui se prêtent bien à la comparaison avec des particuliers bâtiments historiques rapportés à la typologie du nymphe (ff.2-3).
L'ouverture de futures rénovations, coordonnées au sein de ces recherches, peut devenir une opportunité unique pour des analyses archéologiques précises de l'usine, confirmant ou permettant de formuler de nouvelles hypothèses sur les structures enfouies dans les niveaux en dessous de l'église.

Poggio Strozzoni: parc Orsini et San Francesco

Un autre axe important sur lequel la recherche a progressé est représenté par Poggio Strozzoni et le patrimoine architectural et archéologique qu'il préserve. Le site est maintenant situé en position périphérique par rapport au centre historique de Pitigliano, sur une butte rocheuse délimitée au nord par la vallée de la Lente et au sud par le fossé affluent du Procchio. Le site héberge des immeubles résidentiels dispersés. Parmi les œuvres les plus précieuses figurent les vestiges de l'ancien couvent de San Francesco, conçu par le célèbre architecte Antonio da San Gallo le Jeune, et le parc d'Orsini, une réserve de chasse de la famille homonyme.
Les enquêtes initiées par l'Université ont permis de créer une cartographie précise de toutes les œuvres humaines cachées dans la dense végétation qui caractérise la zone (f.4). Les investigations ont permis d'identifier des affleurements rocheux sculptés dont il n'y a aucune trace

Cartographie GPS des œuvres anthropiques détectées sur le territoire de Poggio Strozzoni lors de la campagne de prospection (Lecci, Pasqualotti 2019).

dans les documents historiques et dans les études scientifiques les plus récentes. Ces éléments semblent reproduire la conformation du belvédère le plus connu dominant la vallée de la Lente, même si leur état de conservation et la végétation au-dessus d'eux les rendent moins reconnaissables.

A' partir d'une première analyse il est apparu que la position de ces découvertes, localisées grâce au levé GPS, présente constamment la même altitude, et en plus celles-ci apparaissent mutuellement déplacées selon un pas constant qui couronne les deux flancs de la colline.

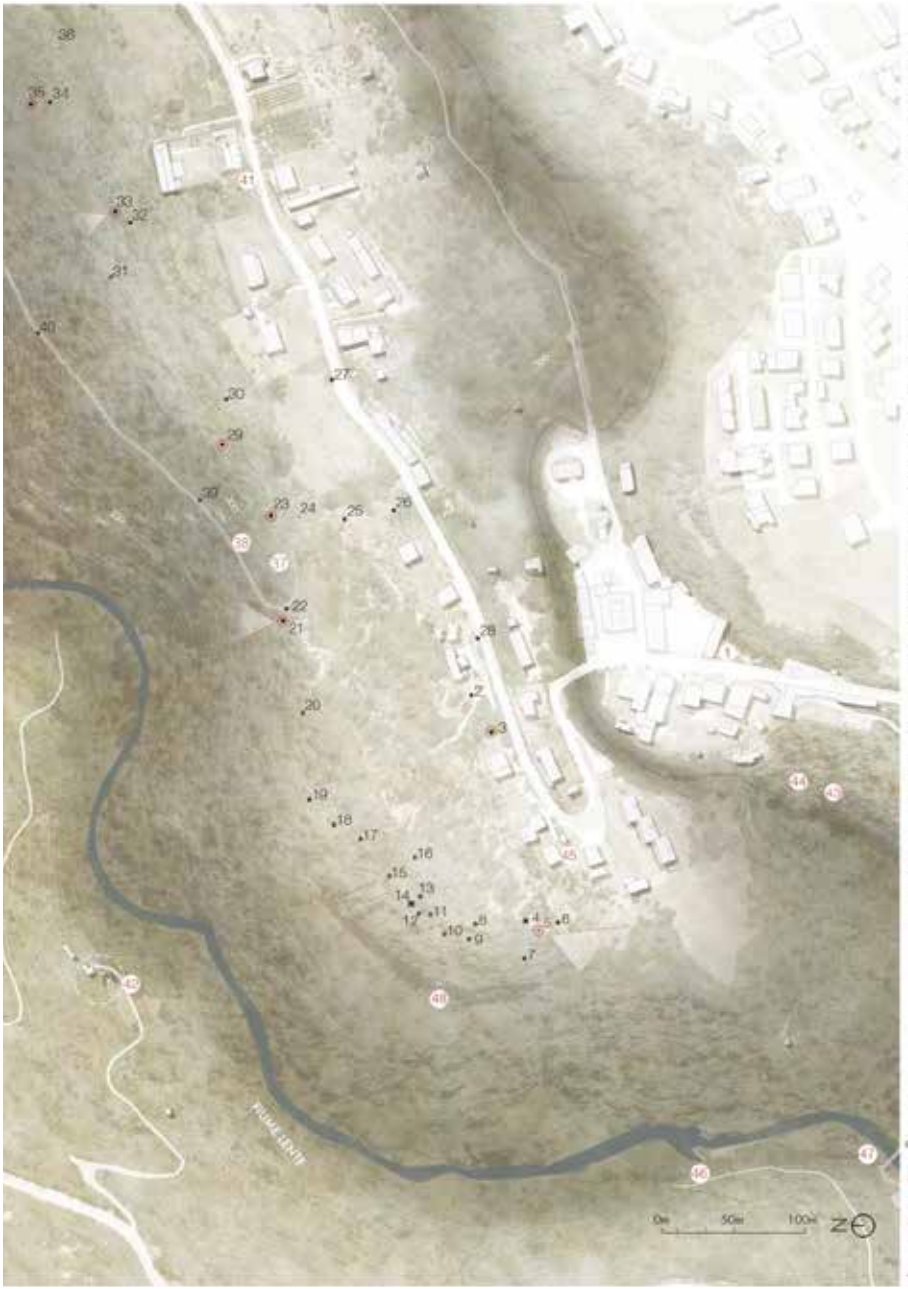
On souligne que le chemin qui les relie pourrait retracer l'itinéraire de guet le long des remparts, et les éperons, les tours coupantes d'un système défensif d'une ville perchée sur le plateau, dont aucune trace ne subsiste aujourd'hui (f.5).

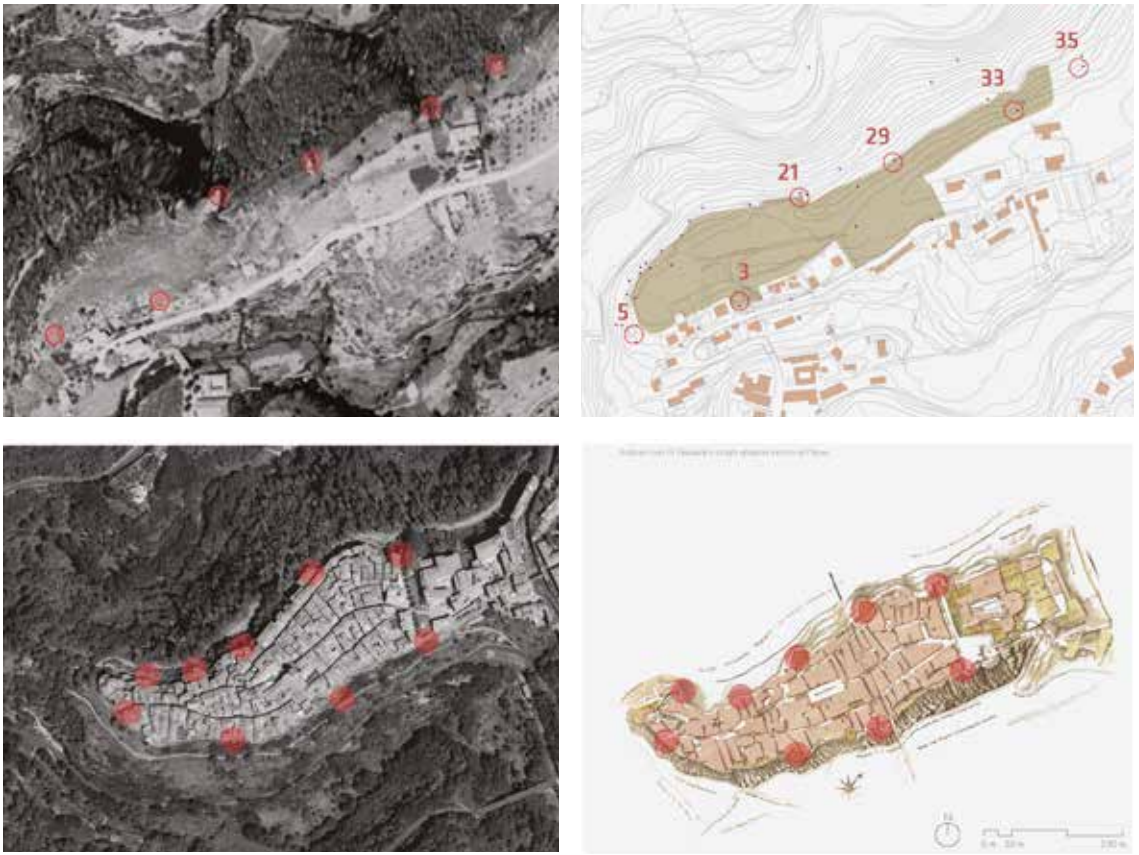
La disponibilité de l'eau sur le promontoire, retrouvée dans un compartiment souterrain et confirmée par la présence du puits du couvent, conforterait cette hypothèse en ouvrant la possibilité de faire des parallèles avec le système binaire des villes étrusques (Camporeale & Morolli, 1990; Boitiani, Cataldi & Pasquinucci, 1973). Selon cette lecture, le centre historique de Pitigliano peut représenter le site étrusque stratifié de la ville des vivants (aujourd'hui naturellement supplanté par les structures d'une période ultérieure) tandis que Poggio Strozzoni est le siège de la cité des morts et en tant que tel il est resté principalement intact au moins jusqu'à la création du parc Orsini.

La troisième mission universitaire

L'analyse des structures architecturales et du peuplement a représenté dans cette recherche un point de départ sur lequel on fixe la troisième mission universitaire. Les données collectées sont devenues un substrat informatif pour intervenir sur le patrimoine historique existant selon des lignes directrices capables de prendre en compte soit la tradition locale soit les nouvelles méthodes de diffusion dans le développement, atteignant le niveau mondial de prise de conscience et de connaissance des racines historiques des gens qui y vivent.

Les travaux de recherche menés par l'équipe de professeurs et chercheurs impliqués ont été un signe avant-coureur d'initiatives populaires au niveau scientifique et médiatique. En juin 2019, le diocèse de Pitigliano et l'Université de Florence ont organisé deux jours de rencontres sur les thématiques importants du dialogue et de l'amitié des peuples de la Méditerranée. L'écho international du sujet traité a vu se rendre dans ce village des hautes fonctions religieuses et politiques comme centre emblématique d'une ancienne complicité entre culture chrétienne et culture juive.


1 Rovine dell'arco di ingresso al Parco Orsini
2 Ingresso attuale del Parco Orsini
3 Sperone roccioso e grotta attualmente usata come garage
4 Statua del dio con cornucopia
5 Sperone roccioso con fondazioni di una struttura in pietra
6 Grotta con bassorilievo
7 Incisioni su parete rocciosa
8 Sedili
9 Tracce di lavorazione antropica della pietra
10 Sedili
11 Sedile nella nicchia con piazzale circolare antistante
12 Sedile detto del papa
13 Sedile umano
14 Statua della Ninfa che dorme
15 Sedili
16 Sedili
17 Scalette scolpite
18 Tracce di lavorazione antropica della pietra
19 Tracce di lavorazione antropica della pietra
20 Sedili
21 Sperone belvedere
22 Antro scavato ai piedi della torre
23 Sperone roccioso
24 Tracce di una struttura ipogea e presenza di acqua
25 Affioramenti rocciosi
26 Tracce di lavorazione antropica della pietra
27 Frammento murario del perimetro del Parco Orsini
28 Capitello scolpito a bordo strada
29 Sperone roccioso
30 Tracce di lavorazione antropica della pietra
31 Sedili
32 Scalette scolpite
33 Sedili panoramici su sperone roccioso
34 Vano incassato nel pendio, a pianta circolare, senza copertura
35 Sperone roccioso inglobato nella vegetazione boscosa
36 Fonte
37 Tracce di un canaletto tipo catena d'acqua
38 Sentiero in pendenza costante che va dal belvedere n21 allo sbocco del fosso del Lupo sul fiume Lente
39 Grotta con struttura antistante (ipotizzata trappola)
40 Tracce di lavorazione antropica della pietra
41 Rovine del convento di San Francesco
42 Rovine della chiesa di Santa Maria dei Concelli (o Cancelli,1825, Ceccarelli)
43 Posizione dell'antica polveriera (1825, Ceccarelli,1830-1835, Pianta geometrica del territorio adiacente alla dogana di Pitigliano)
44 Posizione dell'antica gualchiera (1825, Ceccarelli)
45 Posizione dell'antica casa Strozzoni (1785, Leoni)
46 Pescaia dell'antico molino
47 Antico molino
48 Area di estrazione dismessa
Punti localizzati con il GPS
Sedile scolpito
Sperone roccioso
Presenza di acqua
Scultura antropomorfa
Elementi del territorio individuati sulla carta tramite sopralluogo o cartografia storica
Punto panoramico
0m 50m 100m
FIUME LENTE



Hypothèses comparatives entre certaines structures spécialisées du nymphe et les observations faites sur les levés électromagnétiques réalisés en 2016 (Rivetti 2018).

Pitigliano est en effet connue comme la petite Jérusalem italienne où vit encore aujourd'hui une très petite communauté juive, survivant, grâce à la solidarité locale, aux répressions ethniques de la Seconde Guerre mondiale. Ce lien voit encore de petits groupes de visiteurs venant du grand Jérusalem jusqu'à Pitigliano à la recherche des racines historiques de leurs ancêtres.

Enfin, l'ensemble du processus cognitif a visé à renforcer le réseau muséal en tant que stratégie clé sur laquelle se concentrer pour répondre aux exigences utiles avec le but de réaménager Pitigliano non plus comme un *inner area* mais comme un pôle attractif. Dans ce sens-là, l'équipe universitaire travaille actuellement en collaboration avec le musée diocésain du Palazzo Orsini pour réorganiser l'offre de connaissances à travers des parcours intégrés qui permettent au visiteur de ne pas conclure son expérience à l'intérieur

des salles d'exposition mais de transformer la visite du musée dans un moment informatif où prendre conscience de toutes les opportunités que le territoire permet de vivre.
La création de vidéos intégrées entre vols aériens et réalité augmentée permettra à l'observateur d'être projeté dans un espace proche (le territoire du « Tufo ») et dans un temps loin. A' partir de la période étrusque, des « vie cave » et de Poggio Strozzoni, on peut trouver un *continuum* temporel dans les traces de l'époque romaine cachées dans les profondeurs de Sovana, dans les structures religieuses médiévales et en fin, à travers la Renaissance, on peut voir les traces expressives d'architectes célèbres tels qu'Antonio da San Gallo le Jeune et silencieux témoins de l'ancienne vitalité du village.
Dans le même temps, cette activité a permis de développer de nouvelles collaborations avec la commune de Pitigliano pour la rénovation de la passerelle piétonne située sur le côté nord du village et créée pour un projet d'accessibilité aux lieux publics municipaux. En vue de réorganiser et de renforcer les ressources déjà présentes sur le site, le projet proposé veut récupérer ce passage pour piétons en profitant de l'occasion pour créer des points d'information itinérants vers Poggio Strozzoni en intriguent l'observateur qui est donc incité à chercher et à se plonger dans la réalité qui l'entoure.

Conclusions

L'implication des acteurs locaux (artisans, restaurateurs, hôteliers, artistes) garantit un meilleur retour d'expérience sur l'ensemble du tissu social directement ou indirectement impliqué. En mettant en œuvre une vivification tourisme-culturelle, la zone concernée bénéficie d'un renforcement de l'économie qui en cascade affecte l'ensemble du système économique local. Ce renforcement et la création d'attracteurs d'intérêt sont donc à l'opposé du phénomène de dépeuplement du village qui vise à devenir au contraire une destination prisée pour ceux qui veulent échapper au chaos des grandes villes, mais de plus en plus aussi pour les jeunes locaux en ce qui ouvre la possibilité d'investir des ressources sur leur territoire d'origine sans être obligé de trouver du travail ailleurs.
L'ensemble du projet ainsi structuré voit donc jeter les bases pas seulement pour la revitalisation d'un flux touristique attiré par une offre immersive dans la réalité locale adaptée à une intracommunauté capable de "*réseauter en partageant les services*", mais aussi il vise à première instance au processus de prise de conscience des lieux eux-mêmes. L'intervention de l'Université a en effet offert une 'reconnaissance extérieure' de la valeur de la culture locale, en permettant aussi aux autochtones de consolider leur affection pour le territoire en privilégiant cette "*dimension 'ville' qui regarde la capacité des centres à être 'inclusifs' au sens social et donc de changer le simple habitant en citoyen*"(DPS, 2018).

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THE CHURCH OF S. GIOVANNI BATTISTA DECOLLATO AT MENSANO (SIENA): AN ASSESSMENT OF THE STRUCTURAL CONDITION OF THE CHURCH AND ADJACENT BUILDINGS

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West view of the hilltop town of Mensano.

The Church of S. Giovanni Battista Decollato at Mensano (Siena), has a basilica plan with a central nave and two side-aisles, each terminating in an apse. Inside there are eight massive monolithic columns, with classicizing capitals carved with allegorical subjects. The building has undergone several transformations over the years of building a ctivity. Traditionally ascribed to Maestro Bonamico Pisano, who was involved in the actual construction of Pisa Cathedral, and in the execution of the pulpit of Volterra Cathedral, the capitals are without doubt the most interesting decorative elements in the Church: a rare, if not unique, example of Pisan Romanesque sculpture in the Elsa Valley. The church is an emblematic example of minor (secondary) historical heritage, and is a key representative of religious architecture of the time. It is even more significant in view of its proximity to the old Via Francigena.
The church is on the small hilltop town of Mensano, a medieval Senese outpost in the far western sector of the Upper Elsa Valley.
Geological studies identified an active landslip affecting the slope immediately behind the apse section, while suggesting deep-lying damage and cracks in the ground, which indeed can be seen in the walls of the building.
An accurate investigation was carried out on Pieve, which consisted of classic metric, material and morphological phases. In particular attention was taken to the survey of the cracking framework, which has highlighted a serious cinematism in progress.
At the same time a numerical analysis was carried out which confirmed the low degree of seismic vulnerability of the monument.
The case of the Mensano's Pieve is an emblematic example of minor (secondary) historical heritage, and it is a key representative of ancient religious architecture.
The countless medieval baptistery churches across Italy are increasingly suffering from gradual abandonment. The causes of this are to be found in the recent global economic crisis, which, in Italy, have led to a drastic cut in the resources normally set aside for basic maintenance, at least.
But "minor" does not mean "less important", because, as in the case of Mensano, these works are often true architectural and artistic jewels. Not protecting them, or doing only little to protect them, is a very serious mistake, especially in view of the high degree of seismic activity in Italy, specifically in areas close to the monument in question.

Keywords: Monument Conservation; Structural Conservation; Archeology Of Architecture; Italian Medieval Churches; Interpreting The Archaeological Record.

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Fig. 2
Magister Bonusamicus
Capital of the king with crown and pilgrims.

Introduction

The small hilltop town of Mensano, a medieval Sienese outpost in the far western sector of the Upper Elsa Valley, stands on the north-eastern side of one of the hills which form the watershed between the Elsa valley and the Cecina valley. Its existence is attested since 1011 as a centre for property owned by the Bishop of Volterra. No document attests to the foundation of the Pieve (rural church with baptistery) di S. Giovanni Battista Decollato, located outside the fortified site, on the sheer drop at the south-western edge of the site. The Church, unanimously dated to the second half of the 12th century, has its rear (apse) wall facade facing west, and the front facade set at an angle to the perimeter walls. (Fig. 1)

The building has a basilica plan with a central nave and two side-aisles, each terminating in an apse. Inside there are eight massive monolithic columns, with classicizing capitals carved with allegorical subjects.

This is without doubt the most Pisan Romanesque pieve in the Valdelsa, considering three fundamental stylistic features which determine its particular appearance: 1. The

minor apses created within the thickness of the perimeter wall (and thus not apparent externally), present only in the Volterra Diocese; 2. The bays marked off by simple columns (there are no pilasters, which are common in contemporary churches in this area); 3. The typically Pisan-style aesthetic in the design of the capitals.

Traditionally ascribed to Maestro Bonamico Pisano, a pupil of Biduino, who was involved in the contemporary construction of Pisa Cathedral, and in the execution of the pulpit of Volterra Cathedral, the capitals are without doubt the most interesting decorative elements in the Church: a rare, if not unique, example of Pisan Romanesque sculpture in the Elsa Valley. (Fig. 2)

The walls are generally built of regular courses of well-conserved limestone mixed with unshaped conglomerate blocks. These have been greatly altered by atmospheric agents, giving the building its current appearance of a "random" two-colour scheme. There are several construction phases, and the building has undergone several transformations over the years of building activity, all of which can be seen in the visible walled sections. (Fig. 3)

On the external walls of the church there are traces of old plaster, as we can see from isolated surviving portions of plasterwork on the facade, in places where the intense deterioration of the surface of the sandstone, or "pietra scura" ("dark stone"), required the insertion of "wedges" consisting of fragments of brick or tile, and mortar. It is difficult to know when this restoration work took place; in early 20th century photos we can see the wall of the church can clearly be seen.

From these old photos, we also learn that, at least until 1915, the outer steps giving access to the church ran parallel to the facade. There is no evidence relating to the dismantling and subsequent re-assembly of these steps, or to the creation of the modern-day small terracotta parvis. The structure of this stairway was found by archeological excavation of the parvis, in 1999.

Nor do we know the date when the original portal architrave was replaced; we have only a *terminus ante quem*, from photos from the early 1910s, showing the two sandstone stumps, with a white Gallena marble slab, set lower than the original position. The portal lunette was later plastered and painted over, in order to blend in the large area of brick infill which had to be set in place above the architrave, probably at the same time as the subsequent interventions to reorganize the interior.

Indeed, the church's interior was modified, presumably in the middle of the last century, in accordance with a late Baroque style.

During the 1950s, the Soprintendenza ai Monumenti e alle Gallerie di Siena carried out restoration work in the Pieve. The plastering, the altars, and anything except the Romanesque

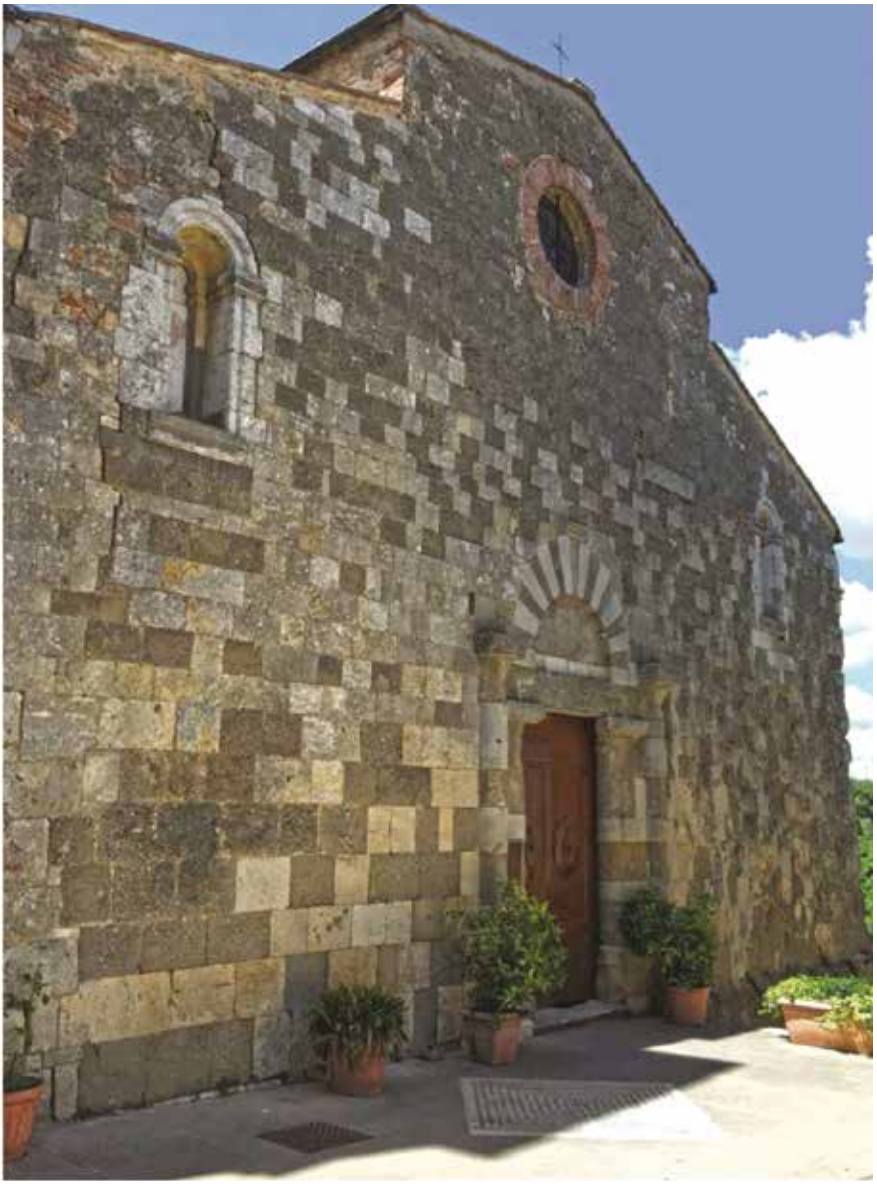


Fig. 3
The Church's facade.

style were removed. On this occasion, a lot of damage to the structures from gunfire in 1944 was repaired, and substitutions were made in the Romanesque style, like the current travertine (semi-crystalline limestone) mono-arched windows on the façade and, on the north side, the mono-arched window in the middle of the wall. (Fig. 4)

From the second half of 1998, the church was restored by the municipal administration of Casole d'Elsa. This consisted in extraordinary maintenance work on the roof of the side-aisle, while conservative restoration and fact-finding surveys were carried out on the entire building. During the restoration work on the facade portal it has been necessary to replace the *architrave*, which was seriously damaged.

To make a new replacement legitimate, it was essential to find a new material which was appropriate. The presence of two surviving fragments of the original architrave, still in situ, roughly chiselled to allow the housing of the marble block, suggested clear information about the type of material used, which came from the ancient quarry of conglomerate sandstone, which had been inactive for centuries, located at "La Serra", very near Mensano.

This it was decided, on the advice of the *Istituto di Mineralogia e Petrografia* at the University of Florence, to use a surviving section of the "La Serra" quarry, suitable for new quarrying, conducted using traditional techniques, to extract a stone block needed in order to make the new architrave of the Mensano Pieve.

Structural decay

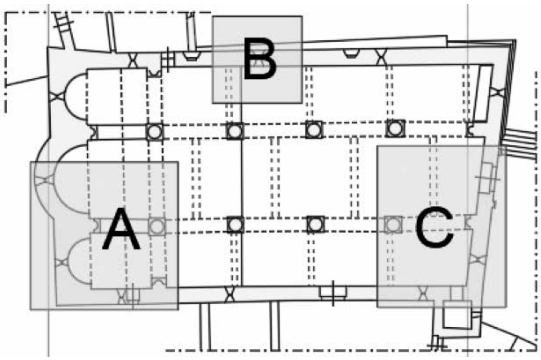
The Mensano Pieve started to show serious signs of structural instability since the end of last century. Between 1998 and 2010 historical, typological and archeological studies were conducted on the Church[1]. In response to an evident system of cracks in the fabric of the walls, these tried to collate all information which might help to identify the causes of this, before then taking steps to consolidate the building adequately. Geological studies identified an active landslip affecting the slope immediately behind the apse section, while suggesting deep-lying damage and cracks in the ground, which indeed can be seen in the walls of the building. In addition, these same studies found that the system of foundations is inadequate, and found there are cavities in the layer immediately below the foundations, probably of an anthropic nature, as well as a lithological situation which results in the terrain being less resistant, thus requiring immediate consolidation measures.

[1]See Angeloni A. 2018, *La Pieve di San Giovanni Battista Decollato a Mensano (Casole d'Elsa – Siena): un'analisi tipologica ed iconografica*, in Miscellanea Storica della Valdelsa, anno CXXIII, 2017. 1-2 (332-333), Florence pp. 71-102.

Fig. 4
The Church's interior.

Fig. 5
The intervention areas.

The studies conducted from 2015 December to February 2017 by researchers and students of the Department of Architecture of the University of Florence (under the auspices of Restoration Laboratory, Course of Statics and Stability of Masonry and Monumental Buildings, Prof. Michele Paradiso with Dr. Alessandra Angeloni, academic year 2016-2017), were occasioned by a dangerous acceleration of the collapse processes which were under way, starting from the forward rotation and sliding down of the keystone of the south apse of the church. This led the Bishop's office to proceed both to a



provisional shoring up, and to the monitoring of the widespread areas of damage to the Pieve. It is therefore worth describing in detail the complex system of cracks, albeit only as regards the main characteristics, dividing it into parts, to help their description.

The church consolidation project

Local structural restoration interventions were planned in 2020, on behalf of the Archiepiscopal Curia of Siena, aimed at mitigating the secondary instability in progress in the structure of the church of San Giovanni Battista Decollato, postponing the solution of the primary cause of the instability, ie. the subsidence of the foundations occurring in the past.
Three areas of intervention have been identified (as well as the bell-tower area, still under study), with the presence of vulnerabilities, as detailed below. (Fig. 5)

A - THE STRUCTURAL DECAY: VULNERABILITY ZONE OF INTERVENTION

- Vulnerability zone of Intervention A – South-west apse
  As regards the state of damage to the walls, significant crack patterns with very marked lesions are highlighted. The most significant critical points can be summarized as follows.
- Vulnerability 1: The spanning arch of the south aisle, already subject to previous stabilizing measures, features two ashlar blocks that have slipped downwards, determined by the presence of a compression action, deriving from the load of the wooden purlin (longitudinal side beam) above.
  This is a very dangerous example of kinematics (mechanical movement), because collapse occurs when there is a displacement of less than 5% of the net span of the arch, and failure occurs first with the downward sliding of the keystone alone, and subsequently with the reciprocal slippage of numerous ashlar stones.

Fig. 6
Vulnerability A4: The southern minor apse: rotation of the keystone.

Fig. 7
Vulnerability A4: side apse: structural decay.

- Vulnerability 2: Lack of support for the wooden roof joists, due to the kinematic distortion (inclination) under way, which causes the perimeter load-bearing wall to rotate outwards.
- Vulnerability 3: The central apse has widespread lesions.
  The cause of this collapse mechanism is due to the outward inclination of the external facing, as already mentioned, which leads to the formation of cracks, mainly vertical, in the vaulted elements of the central and side apse. Arched and vaulted structures work mainly by the action of compression, thanks to the opposing thrusts that cancel each other out, between one ashlar block and another. Accordingly, this gradual displacement of the facing wall creates a shift in the load of the vaulted elements, that will therefore be subject to instability, and cracks.
- Vulnerability 4: The side apse has widespread lesions, with the inclination outwards of the external facing.
  The cause of this collapse mechanism is, once again, the result of the displacement of the external facing, which leads to the formation of cracks, mainly vertical, in the vaulted elements of the central and side apses. (Fig. 6, Fig. 7)
  Recently, crack meter gauges have been installed, by means of which it is possible to monitor the progress of the cracks over time.
  Further proof of the activation of a phenomenon of inclination is represented by the formation of cracks in the wall at right-angles to the wall that is tending to lean outwards.
  The kinematics in progress seem to be caused by subsidence in the foundations. Attention should be placed in particular on the Geological and Geophysical Report dated August 2010, drawn up by Dr. Geol. Tommaso Pratesi, who, in his analysis of the geomorphological structure, states that "…there was no evidence of such major

movements in the ground, such as open cracks on the surface, or newly formed fractures in the wall (although the latter is only partially visible), however the situation is such that the possibility of a loosening, at least, of the rocky mass of the cliff is to be considered an event that is anything but improbable".

- Vulnerability zone of Intervention B - North aisle walls
  As regards the state of damage to the walls, significant crack patterns with very marked lesions are noted. The most significant critical points are summarized here below.
- Vulnerability 1: Instability due to bending of the internal facing of the perimeter sack masonry wall.
  Specifically, in the load-bearing wall in question, three tests with a videoscope were carried out which revealed the presence of voids in the core, at a depth varying from 12 to 24 cm from the internal facing. (Fig. 8)
  This survey confirms the crack pattern existing in the internal facing, which is unstable due to vertical actions.
  Further confirmation of the instability of the internal facing consists in the expulsion of a portion of the wall, as shown below.
- Vulnerability 2: presence of damp (humidity).
  The area shows evident moisture present in the flooring. Once again this is backed up by Dr. Pratesi's Geological and Geophysical Report. In his hydrogeological analysis, he states that: "Although direct evidence is absent, we must underline the high humidity present on the floor of the Pieve, and the results of the electrical scans (tomographies), which distinctly identified (profiles AA' and BB') a portion of material placed at a modest depth characterized by resistivity values compatible with the presence of saturated materials, and therefore with water circulation. Moreover, the discolouration, and generally the oxidation state of the more superficial materials, is a clear indication of the presence of subsurface water circulation, involving oxygenated rainwater, which occurs at various levels, as a result of the high permeability of the emerging materials."
- Vulnerability zone of Intervention C - North-east facade and counter-facade
  As regards the state of damage to the walls, significant crack patterns with very marked lesions are highlighted, as summarized below.
- Vulnerability 1: Widespread damage to the north facade.
  In the area, exploratory diggings were carried out in the foundations, using archaeological methods. These revealed a crack which, starting from the lesion that has developed in the masonry, would seem to continue down, partly affecting the substrate. It is difficult to state what it is, and to attribute a meaning to it; however, a sub-movement of the formation layer




Fig. 8
Area of intervention B1: Videondoscopy.

Fig. 9
Archeological excavation of the parvis, 1999 (carried out by A. Angeloni and the Archaeological Society of Valdelsa - Casole d'Elsa).

is evident, consisting of calcareous blocks in a deeply oxidized and pedogenized (pedogenically degenerated) sandy-silty matrix, as stated in the aforementioned Geological and Geophysical Report of 2010.

This survey confirms the crack pattern existing in the internal facing, which is unstable due to vertical actions. (Fig. 9)

- Vulnerability 2: Formation of loose bonding involving keystone of the intrados.

The cause of this collapse mechanism may lie in a lowering (or translation) of the abacus, on the outer side, caused by the localized subsidence of the ground and/or foundations. In the case in hand, the crack pattern shows the formation of the loose bond with the intrados, and in the extrados there are cracks visible that are compatible with the formation of loose bonds facing upwards.

Fig. 10
Plan of the project interventions.

B - THE CONSOLIDATION PROJECT

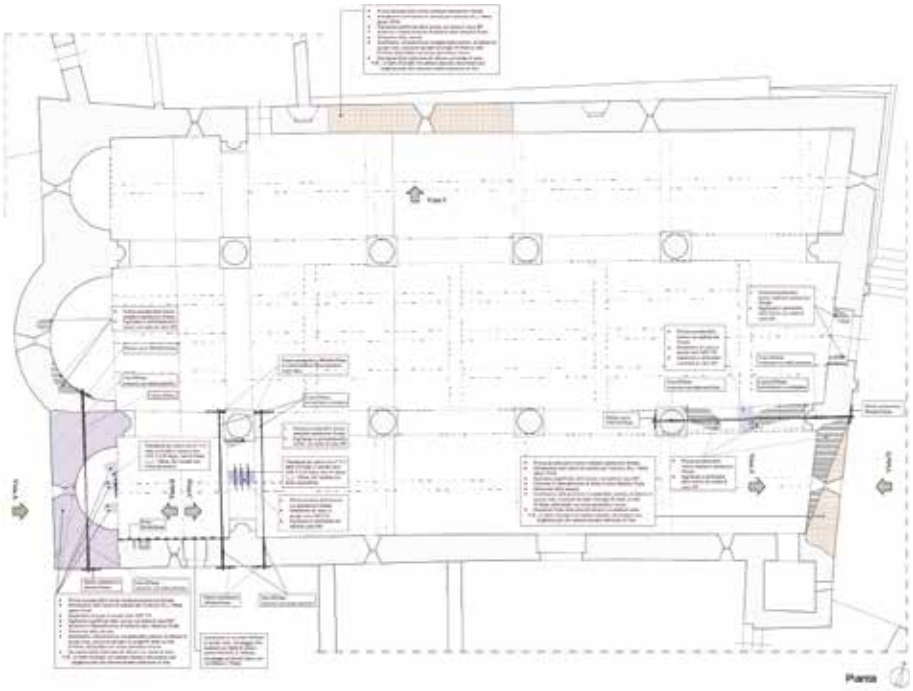
The project envisages the implementation of local interventions aimed at counteracting the progress of the deformation patterns found. Given the modest economic resources available, we have chosen for now not to investigate the aspects linked to geotechnics, to water circulation, and to the consequent possible interventions.

The best-case scenario, immediately after carrying out the planned local interventions, would be the implementation of a monitoring plan to evaluate the possible evolution of the crack patterns. The duration of this monitoring programme should not be less than two complete seasonal cycles (48 months).

Another recommendation is to move on to an in-depth study, and to update, the geological studies already conducted, to avoid the eventuality of a possible landslide on the side behind the apse.

The planned local interventions can be summarized as follows:

- Fill the cracks with AISI316 stainless steel wedges and lime mortar;
- Restrain the perimeter walls, by inserting an effective chaining system, achieved by means of metal chains;



- Consolidate masonry arches by the use of helical bar clamps made of AISI 316 stainless steel, into holes injected with epoxy resin;
- Restore the support of a portion of the wooden roof by inserting a 60 x 60 x 8 mm stainless steel plate, connected to a 60 x 6 mm plate anchored to the existing masonry through holes;
- Consolidate a limited portion of the damaged load-bearing wall (Area of Intervention A-B) by means of surface sealing of the lesions, and low-pressure injections of fluid hydraulic lime mortar, combined with the insertion of steel anchors. (Fig. 10).

Notes on structural decay of the *casa canonica*

It is necessary to mention that the buildings to the north of the church, built on top of the remains of the late 12th century walls of the castle of Mensano, are in a worrying state of disrepair, being abandoned and practically reduced largely to a container of rubble.

The surveys and analyses carried out on the state of conservation of the building, and on its physical integrity, conducted by students and researchers from the Department of

Architecture at the University of Florence (under the auspices of Restoration Laboratory II, Course E, Prof. Alessandra Angeloni, academic year 2019-2020), highlighted fissures in partition walls, belly cracks on the load-bearing walls, collapse of floors due to loss of keying, and collapse of a large part of the roof, and a state of pre-ruin, requiring a series of considerations regarding urgent consolidation measures.

The main cause of this situation is attributable, as already highlighted in the case of the church, to the subsidence of the slope, characterized by an escarpment bordered by the buildings, the elevations of which have lost their mechanical solidity, due to the breakdown of the substrates. This must be remedied, starting with the control and mitigation of landslides.

In addition to carrying out consolidation work, conservation, structural salvage and restoration, it is necessary to attend to the slope, with hydrogeological risk mitigation works, preferably choosing natural intervention techniques, only after monitoring and specific geotechnical analyses, aimed at verifying their stability.

Conclusions

The Mensano church is, as already mentioned, an example of that vast Italian cultural heritage known as the "minor historical heritage", a term used to refer to the extensive, widespread features of Italy's historical culture found nationwide. The *Via Francigena*, so close to the church, was the route to the Holy Land, across the Mediterranean basin.

But "minor" does not mean "less important", because, as in the case of Mensano, these works are often true architectural and artistic jewels. Not protecting them, or doing only little to protect them, is a very serious mistake, especially in view of the high degree of seismic activity in Italy, specifically in areas close to the monument in question.

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RECOMPOSE THE MINOR PLACES, THE VALUE OF THE DICTIONARY LOGIC OF ARCHITECTURE

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Lexical variation of village of Bibola.

Both XX and XXI centuries follow a common path of dis-identity, a path straying from the contents that the historic city has bequeathed us. Starting from the reading of the urban phenomena emerging from the territorial anthropization, i.e. the formation of minor towns in the area between the Apuan Alps and the Appennino Tosco Emiliano, the study highlights the current critical depopulation and dis-identity situation of several small towns. Rich in history and stories, despite their great potential and marked architectural, typological and anthropological characters these towns are often in a severe state of neglect and sometimes their conditions have almost reached beyond the point of no return. Starting from a critical identity reading, we have built an architectural vocabulary of great expressive and constructive value that revealed local typological material building traditions to be handed down. Identity is a term that more than others enables us to understand the urban space: its built-up spaces, its open spaces, the buildings' shape and their relationship with the open space, the materials and how these are mutually intertwined. Almost always associated to other terms, such as memory, character, genetic code, the word identity allows us to justify our work in the built-up space in favor of an operational continuity or, vice versa, discontinuity, to develop a linear path or interrupt it. Whether we operate in the architecture or urban plan field, which to some extent can be considered the same thing, identity can be regarded as belonging, recognizability.

Keywords: Minor places, Small towns, Dictionary logic, urban space.

Starting from the reading of urban phenomena deriving from territorial anthropization, or the formation of the smaller centers of the area between the Apuan Alps on one side and the Tuscan-Emilian Apennines on the other, the study brings to the fore the critical situation of depopulation and the lack of identity of many smaller centers of the considered area, a reality similar to the infinite situations of the national territory. The landscape of the abandonment of many smaller centers, or villages of the national territory can be seen on the one hand as an anthropological problem linked to that philosophy of abandoning more or less complex anthropic structures, on the other from the point of view of the loss of capacity to regenerate architectural values. The theme of the anthropological value of architectural elements, more or less complex, more or less spontaneous has always been part of the sense of identity, the expressive value of workers, a value that has often led to the eccentricity of places and

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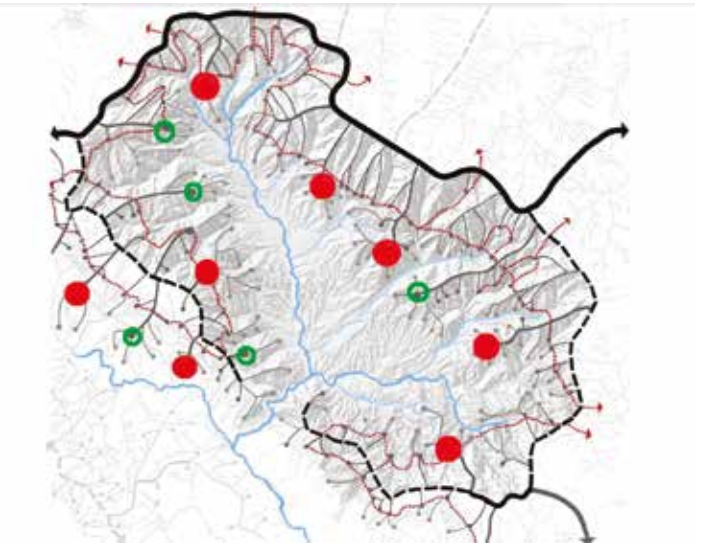

Fig.1
Extract of map with routes of small towns studied.

contexts. We all know that "The appreciation of a place, in fact, does not depend only on the physical conformation of the objects but also, and above all, on the psychological condition that they generate and on the possibility of stimulating feelings that have settled in the conscience of individuals" (Teti 2017, p. 5).

Here then is that this point of no return brings with it the loss of an infinity of manual skills, traditions and manual executions that burden even more in the generic landscape of abandonment and therefore of a loss of identity. A very inflated term, identity, is still today a source of critical reflections for those who are preparing to discover, read and design in the built space in an architectural-urbanistic context. Identity is a term that more than others allows us to understand urban space: its built spaces, its empty spaces, the shapes of buildings and their relationships with open space, materials and how they are connected. Almost always linked to other terms, such as memory, character, genetic code, the term identity allows us to justify our work in the built space, in favor of operational continuity or, vice versa, discontinuity, to trace a linear path or interrupt it. It is a question of operating in the architectural or urban planning field, which in some ways can be considered the same thing; identity can be said to be belonging, recognition.

Given and accepted that the term identity expresses a positive value, at least for the writer, it is necessary to reflect if this value must be handed down, safeguarded, transformed

or distorted, rejected, canceled or even better, given the abandonment of many consolidated structures, the impossibility of its regeneration. Among the first to realize the importance of a consolidated code in architecture and urban planning was Giuseppe Pagano: "an immense dictionary of the constructive logic of man, creator of abstract forms and plastic fantasies that can be explained with evident links with the soil, with the climate, with the economy, with technology, is open before our eyes" (Pagano 1935). It seems clear that we are talking about language, words and how they adopt a lexicon; Paolo Sica is among the first to investigate the building lexicon, the way of composing letters, words and phrases of the historic city: "… the way of composing the elements on several levels and the materials were substantially the same. Each new unit was then born within this unwritten rule of the building tradition and therefore naturally came to be part of, and indeed to strengthen, the local identity" (D'Amato 2004). The current anorexia or architectural bulimia, which invades the cities, but fortunately the Italian ones, demonstrates the effort with which we try to deny even those fundamental principles of the identity of places, from the territory to the architectural word, strong and lasting ideals. "Architectural ideals are based […] on the recognition of the active values of tradition, and on the value of continuity in it. The pitfall lies in the amnesia of those values …" (Capuano 2006).

We have seen that the very existence of individuals and places in charge of their living cannot ignore memory: "in an attempt to make matter and form, mind and body coincide, the function of memory is fundamental as in dreams it is essential to create a bridge between the old and the new ". The historic city is constantly changing; its spaces, its architecture remain in spite of the functions that change there. This recognition, despite the temporal changes, gives that sense of identity that persists over time and space an anthropic linguistic koiné that the depopulation of the villages puts in crisis. Almost all of the historical centers and spaces have contractions, conformations, unique and unrepeatable spatialities, which, if investigated, can reveal meanings of their spatial being. Giancarlo De Carlo talks about "Safeguarding the identity principle from homologation processes" (De Carlo 1998).

The territory always ends up being the background of each of their stories, the more it is in motion and therefore differentiated. Still situations are not told, situations that move and change continue to be told. Even the simplest, the most banal condition, adherence to the place, to the ground, seems to fail. The reduction of adhesion to the ground becomes a constant; what is defined as "the renunciation of the relationship with the ground as anthropogeography […] the denial of the architectural relationship with the ground and its reduction to support … corresponds to the denial of any relationship with history and geography" (Gregotti 2010) also becomes a compositional rule in contexts where adherence to

Fig.2
Lexical variation of village of Cesarana.

Fig.3
Lexical variation of village of Bibola.

the ground is the fundamental element of the construction act, not only for physical or economic reasons but also as a social ritual.

The multiplicity of languages, the possibility of accessing a global and infinite communication, would lead to a common will, to feel the project in an ethical form, instead it appears that it is precisely as a result of the

great possibilities that "… the contemporary man without memory whose freedom is crushed by the new virtual reality forced by the drama of the power of globalization, by its anonymous and invisible domination that makes everything equal to being emptied and killed every day" (Leoncilli Massi 2002). Recognition, identifying an architecture, means that that architecture has a genetic code that can be read, and that by reading it we can understand its meaning and its spatial and temporal location. We can all recognize and intuit that a heavily hanging roof belongs to a specific place, the particularity of a stone wall indicates the cultural area to which it belongs and the more the investigation is particular the more we recognize the object of reading. "The search for recognizability of architecture coincides with the use of an architectural language present in the collective memory, and this is allowed only by a careful study of the past and its constant and permanent elements" (Andreini 1995).

These smaller centers are all united by a "spontaneous" logic of urban formation but unfortunately also by a continuous decrease in the population, a loss of social relations

due to the aging of residents or by a greedy technological isolation of urban relations. Rich in history and stories, the centers, despite having great potential and strong architectural and anthropological characteristics (tabernacles, altarpieces, churches, oratories, crossroads, squares, wash houses) are often in a strong degree of abandonment with situations at limit of "no return". Starting from a critical reading of identity "So the lexicon (the basic elements of language), the syntax (the way of combining these elements in the type and the ways of aggregating types" (Sica 1980, p. 31), an architectural vocabulary of great expressive and constructive value has been recomposed. which highlighted the great value of local traditions with the aim of "Safeguarding the principle of identity from homologation processes" (De Carlo 1998).

The immense architectural cultural heritage can therefore enter into crisis precisely with the abandonment of historic centers.

The contemporary city, now representative of only global laws and interactions, in which elements of speculation and theatrical representations of archistar are contrasted, is unable to regenerate that anthropic relationship between space and man. In fact, all global linguistic

homogeneity is now an established fact. The rationalist dictatorship of Koinè was the end for an identity culture "of the relationship between population and historical building heritage, which underlines another crisis, that of a culture marked by the sedimented values that govern relations with construction" (Alde 2002.). Staying has nothing to do with conservation, but requires the ability to relate past and present, to redeem lost and habitable streets, discarded by modernity, making them alive and current again» (Teti 2014).
The academic research developed on thirteen centers of Garfagnana and Lunigiana, are distinguished by shape, character, type-morphological relationships and above all for the richness of the lexical permanence linked to the detail of the architectural detail. The infinite nuances of materials that characterize the elements of the architectural panorama of these villages constitute a wider puzzle at the territorial level and there they draw an easy-to-read cultural area. These nuances therefore participate in the overall composition of the architectural representations and types of small villages; it is precisely in this great homogeneity and at the same time differentiation that allows us to recognize and appreciate the quality of a place. The great culture of the "spontaneous" is in crisis with the distancing of communities from places that could still generate differences; even if many villages tend to be re-inhabited, that magical relationship between man and space is missing.
As De Carlo said, "in these cases the miracle is more surprising because it reveals a singular wisdom in solving a material cause of use with an increase of potential in expression. It is a question of the mystery of popular culture which is disappearing and which in any case we cannot replace " (De Carlo 2003, p. 5).
What has been noted, which can take on a scientific significance, is the relationship between creativity or the multiplicity of lexical virtuosities with isolation. It seems absurd to point out how much more a village has exchanged relations with the outside, the less is the ability to generate important architectural accents. Among the villages studied we can mention the lexical richness of Gualdo or the manual wisdom that for millennia has drawn the streets of Naggio but also the multitude of vaulted elements of Bibola or the openings of Cesarana. The case of Roggio in this sense is emblematic; on the peak of the Apuan Alps, it is an island straddling the provinces of Massa and Lucca, proto-urban aggregates and agricultural structures remain in the village, the architectural details of which tell us about the great achievement of the popular workers.
This immense patrimony, this immense ability to create a material Koinè from the immaterial, becomes fragile in the face of continuous depopulation or, at best, by the replacement of a civilization or community for the indigenous one. Unfortunately this richness

of words, of lexical expressions, is slowly disappearing; the abandonment of the most remote villages and urban concretions will also lead to the cancellation of an architectural heritage that can no longer be renewed and therefore the definitive loss of identity differences.

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ENHANCEMENT STRATEGIES FOR HISTORIC TOWNS.
A PROPOSAL FOR THE VILLAGE OF SAN GIOVANNI LIPIONI

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View of Vico Storto Street, 2020 (© G. Predari).

In all Europe, many small and medium residential areas have to face different challenges, i.e. depopulation process due to working needs and the increasing in ageing of permanents residents, combined with the economic recession. In Italy, according to recent statistics, in a few decades about three thousand municipalities will undergo desertification processes so that their local traditions and cultural identities will be lost.
The municipality of San Giovanni Lipioni is a small residential area in province of Chieti, where only 150 people live today, and it is experiencing this situation.
The paper describes how knowledge dissemination and new digital technologies in the territorial analysis could help in order to widen the built heritage awareness and support the urban socio-economic development.
The strategy herein proposed consists of an expeditious survey of the urban routes by shooting and filming the small residential centre using drones and action cameras, creating a system of virtual itineraries that allows a full immersion in the village context, accessible by using web platforms.
Moreover, the state of conservation of a group of uninhabited buildings has been evaluated and analyzed, to elaborate synthetic factsheets about the state of preservation, construction features and other useful contents, in order to outline the interventions for functional refurbishment.

Keywords: Knowledge, historical centres, promotion, Abruzzo Region, San Giovanni Lipioni

Introduction

Since the last decades, many areas of the European territory have been interested by a very complex issue: the progressive abandonment of small villages. The causes of depopulation belong to economic, social and psychological reasons, which are, at the same time, strictly linked to the morphology of the site and villages location to main town centres and services, or they are directly consequent to catastrophic events, such as earthquakes or other natural disasters, which are not followed by reconstruction. During the last years, different approaches have tried to offer programs for revitalization of small abandoned centres; many solutions promote tourism development, fostering the visiting of almost unknown territories, which are indeed extremely abundant in natural, cultural, architectural and built heritage, and the expression of the ancient relationship between human activities and nature (Cardaci, Versaci, 2017), a very special bond that is looking for a new balance and harmony nowadays. Since the

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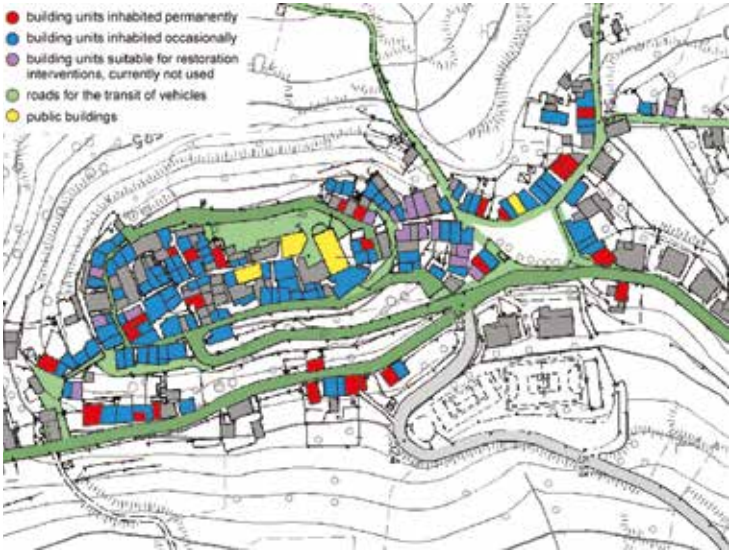

Thematic map of the municipality of San Giovanni Lipioni, based on CTC (Technical Municipality Map), with the indications of the state of preservation of dwellings, 2020 (© A. Chiara Benedetti).

View of Salita della Chiesa Street.

Residential interiors in the historic town centre of San Giovanni Lipioni, different interventions are needed in order to ensure the recovery of the building, 2020 (© G. Predari).

current and evident state of neglect, the valorization of territory conditions has been followed, preferring heritage preservation and supporting social sustainability and conservation of local identities and site memory (Postiglione, Lupo, 2006). In this perspective, regardless of the appropriate strategy to minimize the phenomenon of progressive abandonment of small residential areas, the focus might be pointed on knowledge and dissemination in order to enhance the potentialities of every local community. In fact, many villages that meet, or are meeting, depopulation and abandonment processes, possess specific characteristics, deeply connected to local traditions. These need to be collected, documented and preserved, otherwise they are going to be forgotten, creating a serious cultural loss, in terms of knowledge for the scientific community, and in terms of supporting to the professionals directly involved on the operational level (Ranellucci, 2004). In the process of conservation and revitalization of small villages, local municipalities play a leading role for the adoption of practical policies and appropriate strategies for territoriality enhancement. They also hold economic power in Europe, thanks to European funds (ERDF, ESF and EAFRD), that co-finance the National Strategy for Internal Areas (SNAI), and in national territory following the emanation of the "saving villages law" n. 158, October 2017, 6th (Italy, 2017). This measure provides for a budget of EUR 100 million from national funds, available in the period of 2017-2023, in order to promote the enhancement of historic town centres in a state of neglect by means of maintaining

interventions, rehabilitation of the built heritage, interventions for the safety of school buildings, roads and other infrastructures and actions for supporting production activities. This proposal may be addressed to 5.585 small urban centres, where more than 10 million of citizens live, that are identified as "small municipalities" because they respect some parameters specified in Decree August 2020, 10th (Italy, 2020), whose main objectives are reducing depopulation and encouraging tourism. The 2018 Budget Law (law n. 205/2017) provides for another funding of EUR 91,2 million for the "Strategy for the Internal Areas" in the period 2019-2021. Despite the abundance of European and national funds, the lack of a national program and implementing decrees led to new projects and initiatives directly promoted by municipalities to offer interesting advantages to future residents, i.e. reduced taxation, economic incentives, houses with preferential sale and rental prices, and residence income.
In this context, the association for social promotion "Nessuno Escluso APS" has been founded; its main purpose is to foster the territory of San Giovanni Lipioni, and the headline objective is seeking to tourism promotion and cultural and social enrichment of territory, referring to the principles of sustainable development and environmental compatibility in order to strengthen the community, drawing inspiration from the principles of democracy, solidarity and ethics, aiming at conscience elevation, and personal and communities growth.

A proposal for revitalisation program of the village of san giovanni lipioni

The village of San Giovanni Lipioni, at the border between Abruzzo and Molise, is one of the municipalities interested by the progressive depopulation of "internal areas", which cover more than 60% of national territory, and that are very rich in terms of natural, agricultural and cultural heritage, but ever poorer of services. In these areas, the Italian government has

Different solutions for the realization of romanella, 2020 (© G. Predari).

defined a targeted policy to face marginalization and demographic decline, fostering the protection of the territorial and communities assets (Barca et al., eds., 2014). Situated in the province of Chieti, in the valley of river Trigno, with an altitude of 545 metres above sea level, the small urban centre covers a territorial surface of 8,82 square kilometres; by the last Census in 2019, only 150 people are permanent residents, that are distributed in categories by the age: 0-15 years old, 2%; 15-30 years old, 3,3%; 30-67 years old, 39,7% and > 67 years old: 55%). However during summer season, about 800 people live there to spend holidays in their hometown, as they moved for working requirements. This village has been one of the victim of depopulation process, which has characterized many Italian areas following the booming economy of the period after the Second World War. In particular, from 1971 until now, a decreasing of population exceed the amount of 70% has been registered because of the rural exodus to cities looking for welfare (Ranalli et al., eds., 2019). Moreover, the progressive abandonment of farming in favour of industrialization, influenced the demographic distribution of the area: the main industrial clusters are situated on the coast, and people were naturally led to live nearer to them. In the municipality of San Salvo and Atessa, the great concentration of automotive production activities employs thousands of workers (Abruzzo Region, 2017).

Today, the city of San Giovanni Lipioni is purely residential: there are not schools, public transport, commercial activities; there is only a bar in the main square, a pharmacy and a medical practice. This situation affects the architectural fabric too, in fact only 15% of dwellings is permanently inhabited, 57% is occasionally inhabited during the year, in particular during summer season, and 28% is currently not used.

These data are the expression of a widespread situation in the national territory, a scenario that will lead to the total abandonment of the village in a few decades. The association of social promotion "Nessuno Escluso APS" has been founded in order to avoid the emptying of the city and it operates for the fostering of the territory of San Giovanni Lipioni. The purpose of the activities is to transform the small urban centre in a residential tourist village by respecting advanced criteria of sustainable development, by ensuring the reconversion of the building units, that are not used and in state of neglect, in comfortable houses for tourists or even future owners, and by fostering agricultural and forest heritage, local wine and food high Quality products.

Thanks to the collaboration with the research unit, affiliated to the Department of Architecture at the University of Bologna, a new program of territory valorization has been defined with the full support and synergy of the municipal authorities as main promoter for ensure

Stone portals in Salita della Chiesa Street, 2020 (© G. Predari).

the availability of advanced technological networks, i.e. free fast and ultrafast wi-fi connections, and of existing municipal buildings.

The program development

Strategies aiming at reducing the phenomenon of progressive abandonment of small residential areas, are focused on knowledge dissemination in order to broaden and enhance the potentialities of every local community. In this case, the project can be multi-level implemented, combining modern survey and visualization techniques with the production of exhibition materials, pursuing the common objective to increase the visibility and the attractiveness of the urban centre. The program herein proposed consists of an expeditious survey of the urban routes by shooting and filming the small residential center using drones and action cameras. This process would create a system of virtual itineraries that allows a full immersion in the village context, accessible by using web platforms. Virtual visiting of rural and urban territory is possible thanks to an accurate route

planning, that lead you through narrow lanes and steep stairways, distinctive features of the architectural fabric. Modern digital technologies are the main tool to undertake a comprehensive territory analysis in order to promote tourist development and extend the awareness of built heritage, ensuring the refurbishment and strengthening the authentic appearance of the village. In fact, usually, in villages, more the identity is preserved, more the places are attractive and economic sustainability is assured. The virtual paths meet specific buildings, consisting of about 70 building units, which are not currently used and potentially available for refurbishment and reuse projects, supported by owners or new buyers.

The analysis of dwellings state of conservation and the study of technical solutions that had been adopted during the construction of the buildings, are brought together in synthetic factsheets, to be completed with information about construction architectural typological information, and other useful contents, in order to outline the interventions for the functional refurbishment and for the respect of regulatory standards. The estimate of the parametric cost, for the realization of the mentioned interventions, is also included in the factsheets as relevant information for the future buyer, who can evaluate the total investment.

This analysis allows the identification of specific classes and then the cataloguing of building units in accordance with the types of needed interventions and with the indication of costs. In fact, in the small center, buildings abandoned from decades, never interested by maintenance interventions, nor subjected by regulatory restrictions can be found; in this case, a rehabilitation intervention is going to be unjustified according to a cost benefit analysis, preferring demolition and reconstruction. The state of conservation of other buildings results in different levels of interventions, i.e. focused on the increasing of structural safety and energy refurbishment, or simply on plants upgrading.

Furthermore, the survey operations, carried out inside the buildings, have highlighted some weaknesses of the existing built heritage; in particular, in the internal areas, the territorial property is exclusively private, divided in increasingly smaller cadastral parcels by inheritance successions from generation to generation. Then, on the one hand, the batches have progressively reduced their surface, the owners often live abroad and it's hard to contact them; on the other hand, residential standards have changed so that a serious refurbishment is needed in order to meet current tourism requirements, both for a short and for a long period of stay. More specifically, the union of very fragmented cadastral parcels with the creation of new internal connections (stairs), larger rooms and outdoor spaces (terraces obtained by opening some rooms inside), may be significant interventions in order to improve internal arrangement, and their description is included in the factsheets.

Two different solutions for the realization of balconies, 2020 (© G. Predari).

The outcomes of this research process - expeditious survey of the urban routes by shooting and filming and elaboration of buildings evaluation factsheets - might be used for plenty of both private and public projects. In fact, on the one hand, the creation of the digital platform fosters dissemination, exchanges, and contacts all over the world thanks to the web-based structure; on the other hand, this technical database to dispose, has a central role in the definition of costs for the refurbishment interventions and territory valorization.

The restoration manual of the built heritage

The "Restoration Manual" of the built heritage of the village of San Giovanni Lipioni, is based on the published restoration manual for Abruzzo region (Ranellucci, 2004). The main purpose of this book is to serve as a practical instrument providing guidelines that might be used by municipal authorities to introduce new regulations for the interventions that the professionals, hired by stakeholders, should follow.

The architectural fabric is preserved in its original aspect with the distinctive features and technical solutions adopted for construction components easily visible, as buildings were

not affected by serious transformations and restorations. However, some traditional solutions have been modified since the 1950s, when the availability of national funds from the Law n. 91, July 1952, 25th named "Measures for mountainous areas" (Italy, 1952) allowed the construction of new buildings along the main road and, at the same time, the height of existing buildings in the historic town centre was raised. Instead of using traditional wood floors, the added structure is made of steel beams and brick tile vaults or flooring bricks, that are cantilevered in order to support small balconies. The perimeter masonry of this upper level has been realized in perforated bricks, a constructive solution which is critical in terms of structural resistance and very different from the existing perimeter walls of the underlying levels, realized in natural limestones regularly or irregularly laid CC, so that an appropriate check is necessary.

The Manual collects, catalogues and graphically represents the typical features of a specific built environment; in fact, these elements have to be protected and preserved during restoration interventions in order to conserve the local decorative built heritage that, otherwise, would be forgotten. Among the components which deserve protection, there is the significant construction solution of the cornice in the roof level, that is locally defined as *romanella*, and it is made of two layers of bricks on the perimeter walls, the first one is rotated 45°, the second one is perpendicular to the façade, the third level is made of brick tiles disposed in concave rows, and finally the roof is completed with the traditional covering in brick tiles. According to this solution, the eave is very reduced in terms of amplitude, but it is very decorative despite the use of simple and poor materials. A variation of the previous solution consists in two layers of brick tiles in concave rows completed with the traditional covering in brick tiles, without using bricks in the levels below. Then, the cornice is plastered in both these construction solutions.

Arched openings are another distinctive element of the village architectural fabric; the round or depressed arches are built with bricks or stone blocks that make them look like elegant white limestone portals that highlight the entrance of buildings on main roads. The stone blocks were obtained by huge monoliths, from the local quarry, that were skillfully shaped by stonemasons. These stone portals peculiarity is that a limited number of blocks were used: two box shaped elements for the side columns, and two or three blocks or even only one, round shaped, for the architrave. As stated before, the balconies with steel structure are integrated in the local built heritage, even if these construction components were added from the 1950s interventions.

Two different solutions can be found: the first simpler one consists in NP beams sticking out from the façade line and stone floor; then in the second one, the balcony floor is supported by cast iron shelves, whose decorative language recalls balcony banisters.

Conclusions

The main objective of recent regulatory framework, municipal and regional strategies, is improving the attractiveness of small urban centres by means of rehabilitation of outdoor spaces, historic buildings and other places of cultural interest, and by supporting innovative programs for tourism development in order to promote socio-economic growth and employment increasing. In this context, the bonus for building renovation have a very significant role, as serious tax returns are guaranteed with the respect of high standards in terms of structural safety and sustainability.

Thanks to the mapping and analysis operations of the historic fabric to be restored, a solid knowledge base is obtained that might be used for wider programs. Finally, for the effectiveness of the local economy recovery plan, main divers research is fundamental in order to ensure a bright future to the small village of San Giovanni Lipioni. Agriculture and tourism are the pillars of other similar urban centres, and a good strategy promotes the development of a tourism network offering the product "nature-active holiday", closer to territorial vocation, and the production of few wine and food excellent products, capable to meet consumers expectations, searching for a vacation that combines nature, culture and food (Abruzzo Region, 2017).

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THE DIGITAL DOCUMENTATION OF THE MOUNTAIN VILLAGE OF ROCCA RICCIARDA: BETWEEN MEDIEVAL AND MODERN ARCHEOLOGY

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Axonometric view of the laser scanner point cloud of Rocca Ricciarda.

Rocca Ricciarda is a mountain village located on the slopes of Pratomagno, in the municipality of Loro Ciufenna (AR). In medieval times the site was known to be part of that system of fortifications necessary for the control of mountain passes: the fortress of the village, known since 1191, later became the property of the Guidi Counts; today only the archaeological remains remain, on a rocky spur at the entrance of the village, recently brought to light by excavations conducted by the University of Florence. In 2017 started a research aimed at creating an archive of morphological and three-dimensional data: that data documented the architecture of the historic village, which was completely rebuilt after a fire after the Second World War. The documentation of the historic village was created by planning a campaign of instrumental surveys that reconstructed the entire three-dimensionality of the historic village: both range-based acquisitions with laser scanners and image-based acquisitions were conducted for the creation of accurate three-dimensional models of the architectures, through SfM procedures. This paper reconstructs the various phases and methodologies used for the registration and quality certification of three-dimensional survey data; the graphic restitution process of the two-dimensional technical drawings, which describe the morphology of each building that forms the village, has been particularly deepened. Material information has been added to the technical drawings thanks to the elaboration of accurate orthoimages of each facade of the buildings. The village has also been represented in its landscape value by creating environmental sections, on a general scale, useful for describing the morphology of the territory and the attention paid to creating the mountain settlement.

Keywords: Architectural Survey; Laser scanning; Photogrammetry; Urban Survey, Mountain village

Introduction

In 2017, following an agreement signed between the Department of Architecture of the University of Florence and the Municipality of Loro Ciuffenna[1], which derives from a collaboration relationship that led to deepen some research on the municipal area, a research : the research aims to create an archive of morphological and three-dimensional data documenting the architecture of the historic village of Rocca Ricciarda, in order to update the information on the buildings of the mountain village with modern range-based instrumental survey technologies.

[1] In this regard, the digital survey of the Pieve di Gropina is recalled, a theme that can be explored in Bertocci et al. 2019.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

View of the mountain village of Rocca Ricciarda.

View of the mountain village of Rocca Ricciarda, and of the Arno Valley.

The use of tools such as laser scanners and the participation of the University of Florence would have provided an important research opportunity, with the aim of deepening the methodologies for documenting landscapes and mountain villages. These settlements, following the recent and gradual abandonment of the inhabitants in favor of the most promising job opportunities offered by the major centers, also need from the point of view of the local administration a strong help so as not to leave abandoned villages that they have been an important point of life for the mountain landscape for hundreds of years.

The documentation of small historic centers is a topic that has affected the DiDa from various points of view, such as for the planning of historic centers following the earthquakes that have strongly hit central Italy in the last decade[2] (Bertocci 2013).

In the same way, the University of Florence has been working for several years to make this settlement process evident to the students of the architecture course, and in the last decade it has dedicated important efforts to documenting these realities, using mountain villages as a place of exercise for young students and future architects: this has given them the possibility in this way both to approach and become aware of the theme of mountain villages and the theme of three-dimensional and massive documentation.

Some of the results of this research can be explored in studies relating to the historic

[2] It is precisely in the case of surveys in emergency conditions that this technology has brought an enormous improvement, allowing to quickly obtain the three-dimensional reconstruction of urban aggregates to assess their state of instability.

Casentino villages, which several times have gone beyond mere documentation trying to integrate small projects to bring a contemporary architectural language into the traditional and vernacular mountain architecture (Pancani 2020).

Brief History

The history of the settlement of Rocca Ricciarda can be traced back to the entire second millennium of our era, embracing the entire period from the Middle Ages to its inclusion in the Republic of Florence; the medieval history of the village is particularly interesting due to the close connection with one of the main Tuscan comital families, the Guidi, whose architectural testimonies have been the subject of an in-depth study by the University of Florence, from an archaeological and documentary point of view (Vannini 2009), including the territorial conquests that reached the upper Valdarno between the tenth and the end of the twelfth century, in close relationship with the events of Romagna. The expansionist policies of the Guidi counts, closely linked to the establishment of landed properties, the control of the main monastic complexes (Bertocci et al. 2011) and other forms of land management in depth within the conference held in Poppi (Collavini 2003).

This expansion system includes the acquisition of the Rocca Ricciarda castle, in the process of defragmentation of the guiding estates in the Valdarno territories today part of the municipality of Loro Ciuffenna (Repetti 1833-1845).

The works carried out in recent decades by Tuscan universities have greatly contributed to clarifying the process of Enclosure of the Casentino and Valdarno, analyzing the surfaces of the structures, the masonry, as if they were a real palimpsest that succeeds through medieval

View of the laser scanner survey in the archeological remains of the Rocca.

A section of the laser scanner point cloud, that shows the complexity of the ground levels.

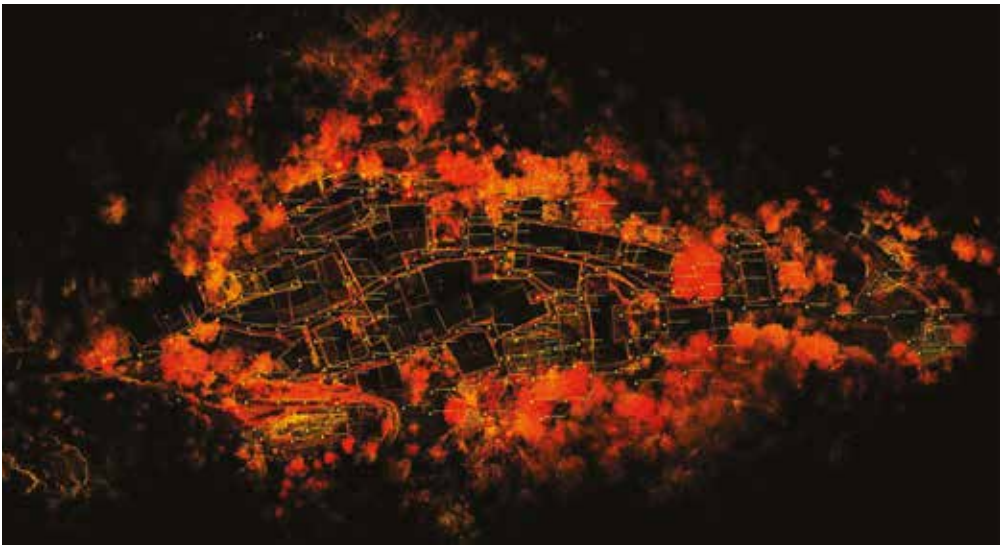
archaeological analyzes, to shape the structures of the period. From the expansionist point of view, the presence of numerous castles in this area is given precisely by the nature of the border of the territory, the first area of expansion chosen by Florence since the thirteenth century. The area around Loro Ciuffenna and the Pieve di Gropina was an important settlement point connected by the ancient Roman road network to the rest of the settlements in the Valdarno area: the ancient Cassia was in fact the main route of medieval settlements (Vilucchi 2002), which connected to the most important Italian centers.

Gradually the settlement system of Rocca Ricciarda has evolved losing its defensive functions; through the centuries it first passed under the control and influence of Florence, but there are no obvious changes until the Napoleonic era, when an ossuary was added outside the village for hygienic standards, which is still visible downstream. Due to the destruction during the Second World War, the village was completely rebuilt by the inhabitants; today most of the buildings are in a good state of conservation, having no more than 70 years of new life but are singularly uninhabited.

Methodologies for surveying the mountain village

For the creation of a digital archive of data describing the morphology of the historic village, it was decided to rely on range based and image-based technologies in order to map all the surfaces of the existing buildings. In this paper we will clarify the methodological

Top view of the laser scanner point cloud of Rocca Ricciarda.



protocols and the choices made to reach a metrically reliable final technical design, which has been a line of research in the digital survey sector for many years[3]: in fact, since the protocols on the acquisition and management of point clouds, the research was aimed at improving the methodologies and using them according to the different purposes of the survey.
The state of the art of research in the documentation sector now requires the use of laser scanner instrumentation in order to create a database of morphological information that is complete and continuously updated: the point clouds constitute an information database that testifies to what the places are like at the moment of acquisition of measurements, in the same way as a photograph; It is now common practice to analyze, in the case of previous three-dimensional scans, the data historically collected[4].
The laser scanner survey of the Rocca Ricciarda village required an acquisition campaign that lasted about a week, dedicated not only to obtaining all the scans necessary to reconstruct the three-dimensionality of all the buildings present and all the unevenness of the ground, but also for educational purposes for the group of students of the Architecture Survey course[5]: the students, divided into working groups, were entrusted with the task of draw-

[3] To learn more, see Pancani 2017.
[4] This made it possible to monitor the evolution of architectures over time, in the same way as an archive of satellite images as we can find on online opensource platforms.
[5] The acquisitions took place within a seminar of the Architectural Survey course held by prof Stefano Bertocci, a.a. 2016/2017.

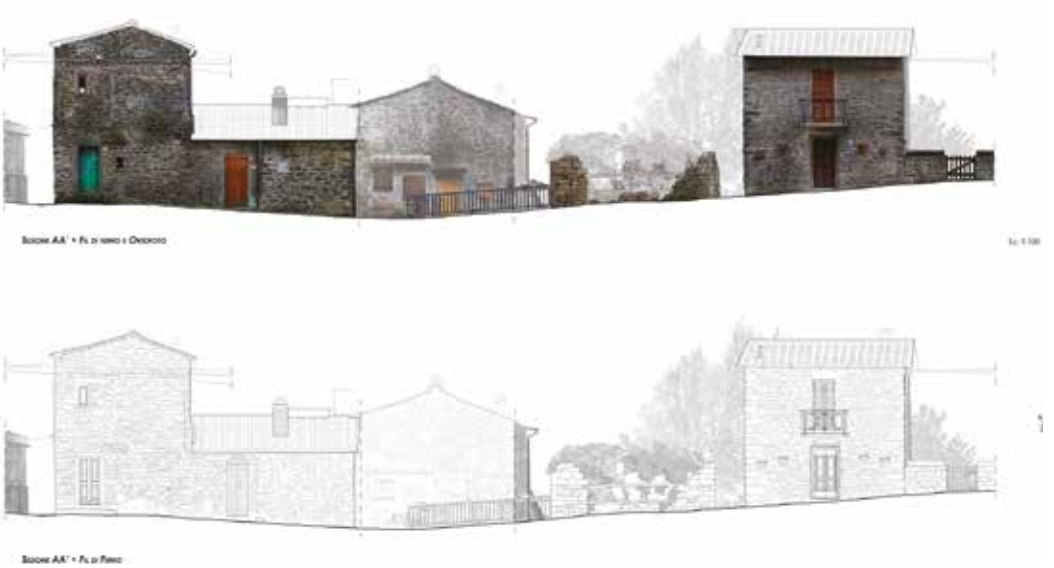
View of a plan with texture
of one of the blocks in Rocca Ricciarda.

ing up a first survey on sight of each aggregate of the settlement, subsequently deepening with collected measures, through traditional survey systems and photographic shots necessary for the realization of three-dimensional models through automatic photogrammetry procedures, the morphology of individual buildings. In fact, from a purely didactic point of view, it is still considered essential to train the student through direct knowledge of the building, which remains somewhat extraneous through digital survey techniques, which do not allow direct contact with the structures.

The creation of the digital scan archive was achieved through the use of quick acquisition instrumentation, which has been repeatedly tested in many massive and rapid acquisitions in other missions within the research group (Bertocci et al. 2017): specifically, the measurement operations were carried out with a ZF Imager 5006h laser scanner[6]. To complete the data acquisition campaign, in this case four days of field work were planned[7]; thanks to the intrinsic characteristics of the laser scanner and point cloud management software, it was preferred to design a survey consisting of many scans, with a high margin of overlap[8] with each other. The survey project involved scanning the entire town of Rocca Ricciarda, paying particular attention to the environmental characteristics of the area around the settlement. At the same time, it was considered important to document what was left on display of the archaeological remains of the medieval tower.

Two different scanning resolutions were selected depending on the portion of the city to be detected. For the analysis of the tower and fortification, where the description of their materiality is important for the purposes of archaeological readings and in any case of the documentation of the historical heritage, it was preferred to perform scans at a high resolution level, while for the part of the city that develops outside the defensive system it was decided to obtain a lower level of detail; the distance between two station points has never been greater than 10m, in order to maintain an excellent percentage of overlap between the scans and to describe all surfaces with an acquisition mesh not exceeding 1.5 cm. The planning of the laser scanner survey did not involve the use of targets or control points, the data acquisition proceeded quickly, and it was possible to carry out a very large number of laser stations (over 100 per day) by the hand of a single operator. A total of 350 scans were made that covered the entire area of the historic center: this data, as well as being a documentation tool for the village, is functional to the compilation of the future filing of buildings[9]. In fact, the design of

[6] The instrument was provided by the DiDA Survey Lab.
[7] The main features are very fast scan times, up to 1000000 pt / s, and a nominal acquisition range up to 78 meters.
[8] The scans have been designed to have a margin of overlap of at least 25% between one station and the next.
[9] The laser scanner survey was conducted and coordinated by the writer, both in the acquisition phase and in the registration phase.



Elevation with point clouds and orthoimages of a block.

Elevation with point clouds of a block.

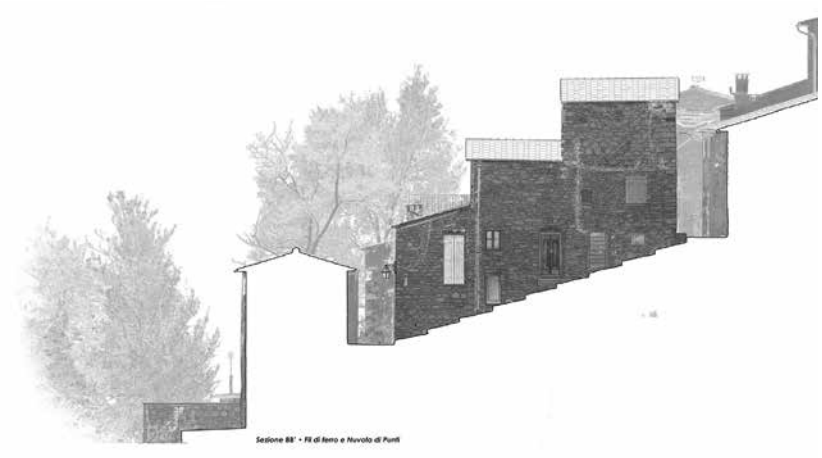
the main front is cataloged for each building unit, which describes not only the full and empty spaces but also the main dimensions (eaves height and width), useful for calculating the surfaces necessary for the control and verification by the urban planning tools: directly from the point cloud, without the need to work in a CAD environment as the return process is usually managed, it is possible to query the database and obtain the necessary dimensions[10].

Once the survey acquisition phase was completed, the registration of the point clouds obtained began; as a first step, the scans were imported and automatically filtered in the Cyclone program. To proceed with the registration, some methodological protocols have been developed to check any rotation errors between scans: the historic center develops as a network of narrow and organic streets, that are not optimal to avoid high errors in registration[11]. To reassemble this survey, we did not have a topographic support network that would allow us to guarantee metric reliability even at long distances[12]: to avoid possible errors in the registration phase, it was decided to reassemble the scans for closed polygon the software to calculate accumulated errors as frequently as possible. The scans were

[10] See Balzani M. 2015.

[11] In topographic survey, in order not to accumulate excessive errors, it is preferable to position the stations as far as possible from each other and to run closed (polygonal) paths to allow mathematically the calculation of the accumulated rotations.

[12] On the subject of laser scanner survey recorded without topographic support, see Bertocci et al. 2014, Bigongiari 2020.



reassembled by experimenting with two different joining methods: through the manual roto-translation of one scan on the other (visual alignment), or through the automatic reconstruction of the positioning of the stations (autoaligment). The visual alignment method is a reinterpretation of the cloud-to-cloud reassembly system, in both systems, taken two contiguous scans and with a good margin of overlapping of points, a cloud constraint is obtained that binds the two stations. The substantial difference between the two systems lies in the fact that previously (cloud-to-cloud) the operator had to select at least three homologous points in the two scans to have a pre-alignment, sometimes a cumbersome operation, while with the more modern system you simply rotate one scan on the other until the points match. Autoaligment, on the other hand, allows you to automatically merge multiple laser stations that have a very high percentage of points in common; to facilitate the calculation of the software, it is possible to indicate in advance which scans are consecutive, among which scans create links, to prevent it from trying all possible combinations. Basically, the two systems produced a similar result, it should be noted however how the automatic recognition of the scanning station has always been successful where the scans had a higher resolution, probably due to the greater number of points in common given by the density. surfaces close to the instrument location.

Once the general point cloud of the historic center has been recorded, the survey certification phase, i.e., registration validation, is followed[13]. To ensure the correctness of the gener-

[13] The instrumental reliability of the single scan is known from the laser scanner specifications, however, outside the methodological protocols developed within universities, there is still no certification system for the registration phase of the point cloud.

al model, numerous vertical and horizontal sections were carried out to verify that the points from different scans overlapped correctly without misalignments not tolerated by the restitution scale. The analysis of the section profiles made it possible to establish that the general point cloud is reliable.

During the data collection campaigns for the purposes of the survey, photographic acquisition of the areas of interest cannot be neglected. The data coming from the camera integrates the morphological information coming from the "metric" survey of a series of important characteristics for the understanding of the urban space and which cannot be described through a technical drawing. First, an adequate photographic survey of the buildings allows to document the actual state of the places, allows the operator to describe the architectural composition of a building or the relationship between two buildings even after some time and far from the place of investigation.

The main contribution of photography to the survey consists in describing all the material information of the buildings; this type of data is fundamental for the preparation of urban plans aimed at the recovery or conservation of urban aggregates, the drafting of the so-called color plan, intended as a coordination tool for all those interventions aimed at the conservation and enhancement of the architectural, urban and environmental components , which combine to form the overall image of an urban aggregate.

The materiality of the buildings can be intuitively described with the two-dimensional photoplan graphics: in this way it is possible to quickly visualize the chromatic and material relationships that exist between adjacent buildings and between an appropriate range of plasters[14]. With the return of the material data, not only the materials with which the buildings or architectural elements are composed are highlighted, the photographic archive provides a precise and accurate survey of the current conditions of conservation of the surfaces of the urban fronts; on the basis of these data, it is possible to identify and catalog the problems related to the surface conservation of the facades and produce thematic documents concerning the diagnostic analysis of surface degradation, thus managing to quantify the damaged surface units. Investigations on the state of structural conservation also require clear photographic documentation as support where it is possible to understand the damage and how it was caused.

With the most modern computer systems and starting from technologies dedicated to the automatic recognition of objects and people in a frame, the three-dimensional image-based modeling systems have finally been developed, based on the automatic

[14] in this case, a careful study on the reliability of the photographic data (color study) becomes appropriate, see Gaiani 2015.

recognition of common pixels between multiple frames and on the spatial reconstruction of the camera's grip points for the creation of a textured model. This spatial reconstruction methodology, correctly defined SfM (Strucure from motion), does not strictly fall within the principles of photogrammetry, it does not lead back to measures of objects but to their three-dimensionality, not based on metric measures: it is possible to obtain complex models of architectures without enter or know any measure, obviously the result will not refer to any metric scale.

The images acquired to obtain three-dimensional models must first of all comply with a certain degree of definition required by the final rendering scale of the drawing; the sensors of the cameras easily reach high definitions (over 20MP per image), this can lead to obtaining datasets that are too redundant and difficult to manage (unless you have very performing calculation stations), or on the contrary, with photos that are too general, not adequately defined with reference to the return scale[15]. In order to allow a correct matching between the frames it is necessary that the acquisitions are as clear as possible and without out-of-focus areas: for this purpose it is important to know the characteristics of the lens well, how it responds according to the variation of the aperture or the shutter speed.

To correctly describe the three-dimensionality of the objects, every single surface must be taken from different angles in several photographs to allow the 3D reconstruction. In order to obtain a texture that is as homogeneous and adequately defined as possible, it is important that all the frames are sharp and that they have the same px / cm ratio on the objects to be represented as much as possible; it is also important that the photographs are taken in the same period of time: exposure of different lights and different shadows during the day, as well as complicating the first phase of alignment, do not allow to obtain a correct texture from the point of view of color rendering and definition.

Conclusions

The three-dimensional survey thus acquired made it possible to create accurate two-dimensional drawings that represent all the aggregates, with floor plans and plants at different scales, deepening up to the scale of 1:50. All the elevations have been returned both by wire and by integrating the material information that comes from the ortho-photoplanes: all these works followed the restitution process described in the previous pages.

[15] In general, for representations on a scale of 1:50, such as those set for the historic center and required by both urban planning and restoration work, the definition ratio to be guaranteed during the acquisition of the frames is 6 px / cm. Compare Pancani 2017.

The construction of a three-dimensional archive and two-dimensional surveying works have made it possible to provide adequate documentation of the village, hitherto missing; at the same time, the creation of the archive will allow for further studies on the digitization and sharing of the information acquired, in line with the main directions of research in the field of architectural representations.

The capture of a general three-dimensional point cloud of the entire architecture of the village can allow to create an accurate three-dimensional mesh model of the entire mountain village, integrating evident lacks of instrumental data of the roofs, which can be used both to better understand the three-dimensional development of the village, built on the slope of the mountain, from a technical point of view, both to set the morphological basis for the development of virtual fruition systems.

In addition to the documentation of the mountain village, which is facing a phenomenon of gradual abandonment, the creation of three-dimensional databases can be the starting point for creating a virtual museum system of the archaeological excavations present on the site, which can attract thanks to their tourist value. attraction to the strongest presence of visitors, because the village is located at the end of a driveway, therefore reachable only if there is a real desire to visit it. The documentation of the archaeological excavations can also be a further technical document which, if shared with the school of archeology, can serve as a useful tool to verify, or integrate information relating to the structures that have remained in evidence of the fortress that gives the site its name.

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FOTOINSERIMENTO

MASTERPLAN DI PROGETTO SCALA 1:500

DETTAGLIO MASTERPLAN SCALA 1:100

DETTAGLIO MASTERPLAN SCALA 1:100

SEZIONI SCALA 1:200

MAPPA DEL FUNZIONAMENTO DEI BYPASS

STIMA SINTETICA DEI COSTI D'INTERVENTO

RECOVERY AND ENHANCEMENT STRATEGIES FOR THE VILLAGES OF THE LIGURIAN HINTERLAND.
THE CASE STUDY OF THE FONTANABUONA VALLEY

Roberto Bobbio, Paolo Rosasco
Università degli studi di Genova-Italia

Inhabited center of Costa di Soglio - Example of a project for the scenario 3 (students: Di Bella J., Franceschi F., Poddie C.).

This contribution addresses the issue of defining strategies for the recovery and cultural, social and economic enhancement of Fontanabuona Valley - located in the Ligurian hinterland between the territory of Genoa and Chiavari - and taken as an emblematic case of a territory in transition, at risk of abandonment but full of potential for new development.
According to the National Institute of Statics data (ISTAT, 2017), today almost half of the Italian population (49%) lives in the plains, where production activities are concentrated, while the remainder in the hills (39%) and a small portion (12%) in the mountains.
In Liguria the phenomenon of the concentration of the population in the inhabited centers of the coast is accentuated by the particular conformation of the territory characterized by a strong slope and without flat spaces to be dedicated to intensive cultivation, more profitable and able to support the economies of families.
The Fontanabuona Valley, our case study, is characterized by a linear urbanization of the valley floor, where the residence and small and medium productive activities are concentrated and by scattered hilly settlements, now sparsely populated, once privileged places of residence of the population who lived on production specialized farms (oil, wine, chestnuts, hazelnuts etc.), quantitatively modest but of high quality, now largely abandoned.
Taking as reference the studies conducted on the Fontanabuona Valley, this work addresses the issue of defining and evaluating (alternative) scenarios of sustainable development of the territory, capable of combining the cultural and historical-architectural values present in the territory with those economic, defined starting from the preliminary demographic, economic, social and cultural analyses.

Keywords: Liguria, Fontanabuona Valley, abandonment, recovery, enhancement

Inner areas and the metropolis

The global growth of urbanization was an announced phenomenon (Gottman, 1961; Hall, 1966) but its speed, size and effects are somehow unexpected.
In many developed economies, not only the largest cities, but also many medium range ones are acquiring the character of regional metropolis, prompting new ways of approaching urban studies and planning (Sassen, 1991; Soja, 2000; 2015).
In Italy, the contradictions and imbalances of this process were detected and described at the beginning of this century (SGI, 2008) and have been the subject of comparative studies that regarded the different part of the country (Balducci, Fedeli and Curci eds., 2017). The

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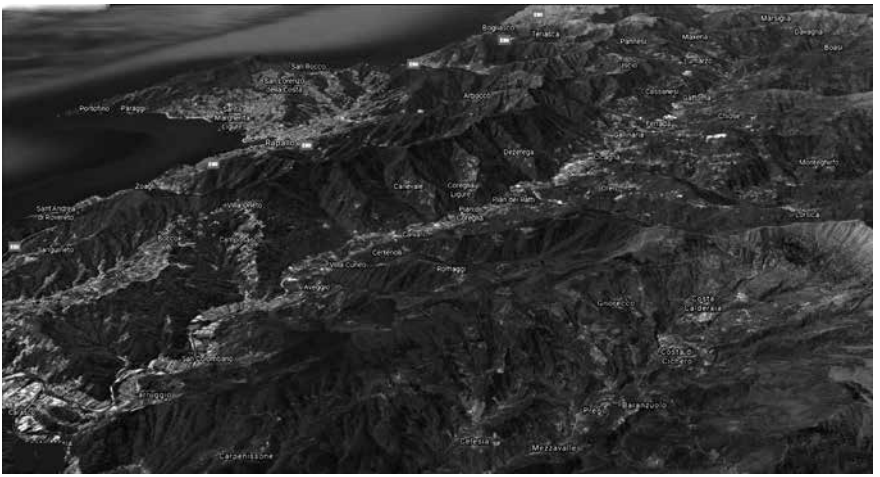


Fig. 1
View of Fontanabuona Valley (source: Google Maps).

Fig. 2
Pairwise comparison matrix for criteria weighing - Scenario 1.

Italian Metropolis is not only a heuristic figure but also an administrative level of government: the Metropolitan Cities created in 2014 are large territories unevenly urbanized that coincide with the previous Provinces, created at the birth of the national State (1860) connecting large and medium size cities with their historic countryside.

An aspect of new urbanization in Italy is the polarization of growth: the urban sprawl that affects city boundaries has a counterpart in the rarefaction of population and activities that affects the interior country. Since mountains go throughout Italy from North to South, every Region and many Metropolitan cities have their portion of depopulated, marginal uplands.

The "National Strategy for Inner Areas" (SNAI), launched in 2014, is a policy for development and territorial cohesion to counteract marginalisation and demographic decline throughout the Country. This policy concentrates on marginal areas aiming to their revitalization; while a new Italian Regionalism (Magnaghi, 2014; 2020; Budoni, 2019) is looking for answers to current urbanization on the idea that a "new pact between the City and the Countryside" is needed; and that this pact must rely on a different model of development, based on the use and recycling of local resources and the idea that heritage is a fundamental resource.

In this frame, mountain is no longer marginal: because it is rich in natural and cultural resources and a concentrate of biodiversity, it is rather the protagonist of the making of a new "bioregion" (Dematteis, 2016; Dematteis and Magnaghi, 2016). Somehow, the Inner Country may lead the path to a better future for the Metropolis itself.

The territorial context

The case study selected for implementation within the boundaries of the Metropolitan City is Fontanabuona, a valley stretching for 20 kms in parallel with the Mediterranean coast, with a population of about 13.000 spread out in ten Communes[1].

The valley floor is a tiny urbanized strip, mixing dwellings, industry and commerce; it is crossed by the State Road n. 225 which connects the city of Chiavari with the Commune of Bargagli and by the provincial road n. 77 that connects Bargagli with the Commune of Genoa (Fig. 1).

The ridges that delimit the valley towards the sea maintain a height between 600 and 700 meters with the summit near the Anchetta (549 m) and Lasagna (728 m) mountains, while those upstream, which make up the Apennine ridge, they reach higher altitudes, on average around 1,000 meters, with higher peaks at the Ramaceto (1,345 m) and Caucasus (1,245 m) mountains. In the final part, near the Commune of Chiavari, the valley is relatively flat and wide while in the initial part - due to the presence of the high peaks - the territory has a steeper conformation. Along the mountain slopes, dotted by small villages, an ancient rural landscape survives; woods and pasture, mainly abandoned, extend on the upper land.

From the second half of the nineteenth century and up to the First World War it is a land of migration, especially towards north and south America (Amedeo Giannini, who founded in 1919 in San Francisco the Bank of America and Italy, later on Bank of America, came from here); communes such as Lumarzo, San Colombano Certenoli and Favale di Malvaro halved the resident population while in others, such as Neirone, Moconesi, Tribogna the population decreased by over a quarter.

The Fontanabuona Valley was a booming economy after the Second World War, when the traditional slate quarrying found new markets for its products (above all in the USA) and many small enterprises, mainly producing and selling furniture, flourished.

[1] Lumarzo, Neirone, Moconesi, Lorsica, Tribogna, Cicagna, Favale di Malvaro, Orero, Coreglia Ligure, S. Colombano Certenoli.

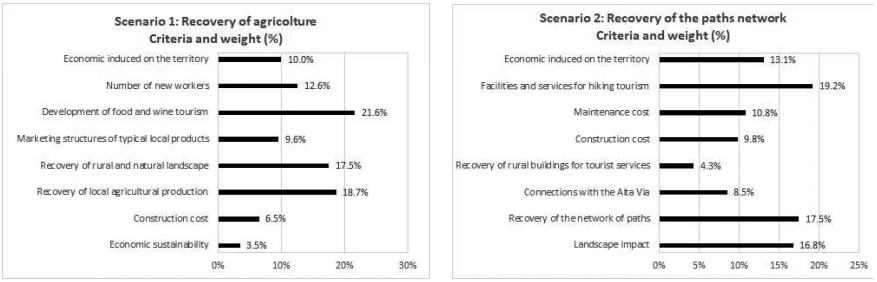


Fig. 3
Criteria and their relative weights for each of the four scenarios.

Starting from the 1950s, the territory was characterized by consistent internal migrations: ancient villages located on the hillside (such as Corsiglia, Roccatagliata, Romaggi) were abandoned and the resident population moved towards the inhabited centers located on the valley floor - which offered more job opportunities as well as to major services (schools, etc.) - or to Genoa and the main towns of the eastern Ligurian Riviera (Chiavari, Sestri Levante). Industrial development concentrated on the valley floor and accelerated the abandonment of agriculture and the desertification of the mountain. Extremely sensitive to external economies, the Fontanabuona Valley suffered very much from the global crisis at the turn of the Century and the diffusion of new models of consumption: export of slate fell and furniture selling dwindled dramatically.

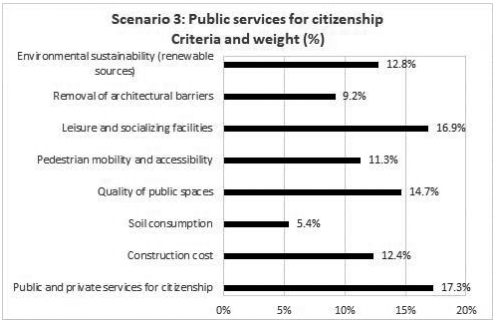
Nowadays, the goal for local municipalities is to rediscover and valorise existing resources as a mean to stimulate a development locally based and less dependent from outside. A particular aspect of the goal is the amelioration of the standard of live, for making the Valley attractive for new inhabitants.

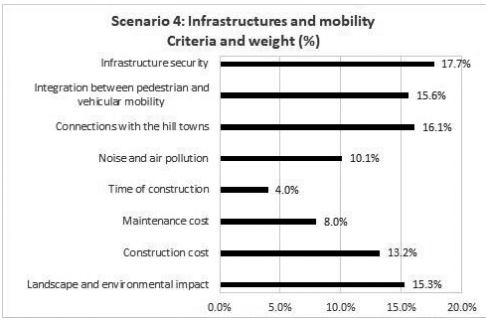
These items have been the subjects of studies and educational programs[2] carried on by the authors at the University of Genoa. Taking landscape, environment, biodiversity, interpersonal relations, nature and space supply as existing values, the studies provided basic knowledge of the territory for projects that had to enhance accessibility, safety, level of infrastructure and services, urban quality; integration between the valley floor and the uplands played a strategic role.

The SWOT Analysis of Fontanabuona Valley

In order to determine what the sustainable development scenarios of Fontanabona Valley may be, a SWOT analysis was developed. The technique is a useful planning aid

[2] Fontanabuona has been a case study for two years in the Course of Urban Planning and Feasibility taught by the authors in the Master Degree in Architecture at the University of Genova, Polytechnic School, academic years 2017-2018 and 2018-2019.





(urban, economic, etc.) used to identify and evaluate the Strengths, Weaknesses, Opportunities and Threats of a certain territory, project, or any other situation on which it is intended to act in order to achieve a certain objective (Hill and Westbrook, 1997; Scott Armstrong, 1982). The analysis is generally developed according to two levels of investigation and research: the first, internal (or endogenous), relating to the strengths and weaknesses detected and intrinsic to the phenomenon analysed (on which the subjects who manage or administer the territory can act directly through policies or actions); the second, external (or exogenous), related instead to the opportunities and threats derived also from extrinsic factors (on which is more difficult to act directly but one can only try to seize, in case of development opportunities or improvement of some conditions, or reduce the negative effects in the event instead of threats).

To carry on the SWOT analysis, it is necessary to refer to a coherent pattern of values and finalities.

In our case, values emerged from the preliminary evaluation of the general conditions of the valley examined using criteria typical of bioregionalism:

landscape to be taken as a basic resource, either under the cultural and the economic point of view;

re-appropriation of their territory as an instrument for local communities to promote cultural and economic development;

the rural environment as the new frontier for triggering processes of this re-appropriation;

creation of new polarities as strategic for consolidating the urban environment;

open common spaces as fundamental element for social cohesion and the requalification of the built environment;

reuse and restoration as preferable modalities of intervention.

Tab. 1
SWOT Analysis of Fontanabuona Valley.

Field	Strenghts	Weakness	Opportunities	Threats
Landscape and environment	Beauty natural and agricultural landscape	Hydrogeological instability	Regional and national funding for the development of land recovery activities	Forest fires
	Presence of SIC (Site of Community Interest)	Abandonment of traditional agricultural production activities	Proximity to consistent coastal tourist flows	Regional urban regulation that favors new land consumption
	Panoramic points (Ramaceto)	Building activity of poor quality and typologically incongruent with the characteristics of the landscape		
	Variety of the ecosystem	Flooding of the Entella and Lavagna torrents		
	Beauty river landscape (Entella and Lavagna rivers)	Poor enhancement of natural and landscape beauties		
		Acoustic and atmospheric pollution along the road axis of the valley floor		
Economy	Presence of areas for productive activities on the valley floor	Concentration of tourist presences in the summer period (holidays homes)	Availability of areas for the establishment or expansion of sustainable production activities	
		Low demand for real estate and low real estate values	Growth in demand for hiking tourism	
	Availability of water for irrigation of land for agricultural use	Poor digitization of the territory	Low real estate values	
		Tourist flows limited to summer holidays	High quality local agricultural products (chestnuts, hazelnuts)	
	Slate mining activities	Lack of adequate accommodation facilities for tourists		

(follows)

In relation to these specific characteristics of the Fontanabuona Valley territory, the SWOT analysis has been developed in order to four aspects considered meaningful[3]:

1. Landscape and environmental;
2. Economy;
3. Social and cultural capital;
4. Infrastructure and transport.

Table 1 shows the SWOT of the Fontanabuona Valley; it highlights a territory that presents critical issues related to:

the demographic decline and the migration of the population to the nearby coastal centers (Chiavari, Sestri Levante and Genoa);

the abandonment of the territory and traditional agricultural activities;

the lack of public services (schools, public transports, etc.) in the hilly settlements;

some critical issues related to both primary and secondary mobility (heavy traffic on the valley floor and dangerous conditions for pedestrians, poor maintenance of secondary roads, etc.).

[3] The SWOT represented in Table 1 is the summary of the SWOTs developed by the students on ten territorial areas of the Fontanabuona Valley. Direct inspections were carried out for their drafting, analysed the data available from direct sources (local administrations) and from observatories and research institutes (ISTAT, Chambers of Commerce of Genoa and Chiavari, etc.) as well as through collaboration with local stakeholders (Mayors of the ten communes, representatives of local associations, etc.). The specific references reported in the single SWOT and relating to aspects punctually detected in the territory (individual real estate of historical-architectural value, etc.) have been summarized for each concerned area (e.g.: historical-architectural beauties, etc.).

Field	Strenghts	Weakness	Opportunities	Threats
Social and cultural capital	Buildings of historical and architectural value	Poor state of maintenance of buildings of historical and architectural value	Growth of cultural and food and wine tourism	Scarce economic resources for the maintenance of public cultural assets
	Slate Museum in Cicagna and Gambatesa quarry	Negative demographic trend	Increased demand for zero km agricultural products	Abandonment of traditional manual work
	Tradition of slate processing	High old age rate of the resident population	Availability of areas to be recovered for agricultural activities	
	Traditional religious celebrations	Fragmentation of social relationships		
	"Feast of Italians Abroad" in Favale di Malvaro			
	Val Fontanabuona Annual Expo			
Infrastructure and services	SS225 connecting Genoa with Chiavari	Concentration of public services on the valley floor	Proximity to a network of trails of regional interest (high via Monti Liguri)	Reduction of regional and state funding for the financing of services
	Presence of many usable tourist routes (Caucasus ring, Alta Via)	Poor maintenance of the path network	National funding for the construction of sustainable infrastructures (cycle path)	Heavy traffic passing through built-up areas
	Slate cycle path	Presence of architectural barriers in built-up areas		
	Availability of spaces to be used for services to citizens	Absence of public transport service between hill towns and the valley floor		
	Municipal Theater of Cicagna	Poor presence of sports equipment and facilities		
	Poorly maintained secondary roads subject to landslides	Absence of commercial activities in the hilly settlements		
	Routes for sports activities (mountain biking, etc.)	Lack of pedestrian paths along the road axis of the valley floor		

The results of the SWOT were then analysed together with the main local stakeholders with the aim of defining possible scenarios for sustainable development in the area and the related actions (projects); these have been configured as a priority by trying to combine the economic development of the territory with environmental protection.

The areas of intervention concern: the natural and agricultural landscape; the tourist offer; public services; infrastructure.

The defined scenarios and the relative projects for their implementation can be summarized as follows:

recovery of the agricultural landscape through the resumption of traditional agricultural activities and creation of points of sale for products at “km 0”;

recovery of the existing paths network, of the historical architectural heritage and the abandoned building of the hilltop villages (Ognio, Canavissolo, Monteghirfo, Costa di Soglio, Castagnelo, Coreglia Ligure) for a new touristic, cultural and gastronomic offer;

Integration of public services (schools, sports plants, public transports, etc.) also in some hill towns (Lorsica, Orero, Costa di Soglio, Favale di Malvaro);

improvement and safety of the state road n. 225 (through the build of alternative routes outside the inhabitants centers and tunnels) and the secondary roads connecting with the hill towns.

The definition of the criteria for the evaluation of the interventions on the territory

Sustainable development scenarios and related actions must be developed according to the characteristics of the territorial context in which they are implemented; they must therefore be defined taking into account not only the objectives set but also the different effects (or impacts) generated (Fusco Girard and Nijkamp, 1997). This is also due to the use of scarce, irreproducible resources and a territory where landscape, historical and cultural values have been stratified over time with respect to which the effects generated by any intervention must be carefully evaluated.

The identification of which scenario best suits the characteristics of the territorial area on which it is intended to intervene can be done through the use of multicriteria analysis; they are evaluation tools that support the decision maker in defining which, among different possible alternatives (projects, plans, etc.) best meets (or allows to reach) the set goal[4].

The selection of the best (or most satisfactory) scenario is made on the basis of criteria (or aspects) selected as a priority by the evaluators as they are considered significant for the purposes of the choice.

Through the involvement of the main local stakeholders, the criteria that must be considered for the purpose of identifying which - among the four development scenarios identified by the SWOT - best meet the development objectives defined for each of the ten territorial areas have been defined of study identified within the Fontanabuona Valley territory and the relative weight (or importance) attributed to the choice[5].

In particular:

in a first phase, the criteria for evaluating the effects generated by the intervention scenarios were identified through meetings with the various actors operating in the area and the representatives of local public administrations;

in a second phase, through the pairwise comparison technique used in the Analytic Hierarchy Process (AHP), a multicriteria method conceived by Thomas Saaty (Saaty, 1980), the weights (percentages) were then defined (i.e. the importance that each criterion

[4] The scenarios indicated are the synthesis of those identified by the students of the Urban Planning and Feasibility course (a.y. 2017-2018 and 2018-2019); they were derived from the SWOT analysis through consultation with the main local stakeholders. Each scenario includes a series of actions (projects).

[5] In this work we only report the analysis developed for the selection of the criteria and their weighting; for reasons of space, however, the following phase of the multicriteria evaluation relating to the identification of the scenario to be developed within each of the ten territorial study areas identified in the Fontanabuona Valley is not reported.

must have for the purpose of choosing the scenario to be developed within each of the ten territorial areas of study)[6];
in a third phase, for each areas of study, the scenario (with the related project actions) to be developed within each of the ten territorial study areas was then identified - again through the AHP analysis and by means the pairwise comparison.
Figure 2 shows the matrix of the pairwise comparison between the criteria selected for the scenario 1[7].

Results

The results of the studies were presented in Calvari (in the core of Fontanabuona Valley) on June 2018 and in Chiavari on February 2019; they got attention from local public, administrations and media.
The posters produced by the students that illustrate the different scenario and projects are now deposited at a local Foundation (Lascito Cuneo in Calvari) to be available for consultation and further studies (Fig. 4).
A main result was that students had the chance to participate actively to the debate on the future of the valley: their ideas contributed to sensitize local communities about the condition and use of resources, the need for an economy more locally based and to enhance care for heritage not only to be considered as a matter of pride but also as an opportunity of redevelopment.
Maybe a small contribution to the formulation of new planning policies for the Metropolitan City but anyhow a successful effort to bring University on the field and make it and local Communities meet and discuss together for a better future.

[6] It consists of a pairwise comparison of each criterion with respect to the others and the attribution of a score on the Saaty scale (from 1 to 9) which indicates the degree of prevalence (or not) of one over the other. To determine the weight of each criterion (expressed in percentage terms), the eigenvector is then extracted and the components standardized.
[7] Expert Choice® software was used for the pairwise comparisons of the criteria and the calculation of weights.

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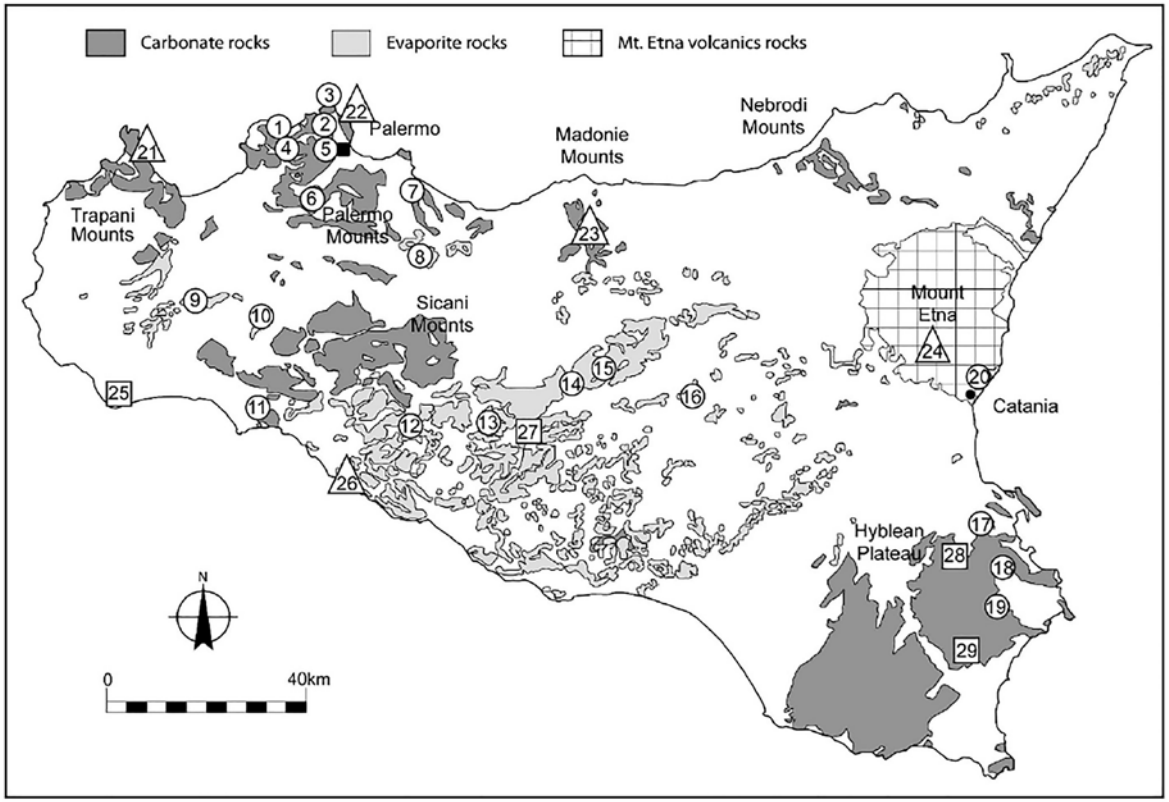
Carbonate rocks
Evaporite rocks
Mt. Etna volcanics rocks
Palermo
Madonie Mounts
Nebrodi Mounts
Trapani Mounts
Palermo Mounts
Sicani Mounts
Mount Etna
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KNOWLEDGE AND STRATEGIES FOR CONSERVATION OF HISTORIC TECHNOLOGIES. EXPERIENCES AND REFLECTIONS ON SMALL URBAN CENTRES IN INNER AREAS

Maria Teresa Campisi
Università degli Studi di Enna "Kore"-Italia

Typology of rock deposits in Sicily. In light grey, the area of the evaporitic rocks. From Di Maggio C., Madonia G., Parise M., Vattano M., 2012, "Karst of Sicily and its conservation", in Journal of cave and karst studies the National Speleological Society bulletin, August, 168.

The buildings of the pre-modern small historic centres are characterized by the use of materials deriving from nearby surrounding open areas, in great harmony with the natural material of the external place. In relationship to the soil materials, the appearance of the different urban buildings changes. For instance, in Sicily, the region analyzed in this paper, whereas most of the historic built environment is carried out in local porous limestone (calcarenite), in some parts of the island different building materials are used: magmatic rocks in the area close to Etna Vulcano; metamorphic and argillous in the Messina district, while the inner part (mainly in Enna, Caltanissetta, Agrigento districts, and in some places in Trapani and Palermo) displays the prevailing use of gypsum.
The quality of the original materials, however, is different from the industrial one currently available. This raises a certain number of issues. The frequent dismantling of the historical-technological elements brings forth a loss of perception concerning the value and property of these traditional features such as their sustainability characteristics. This paper illustrates the following: research on the recognition process of local gypsum materials and techniques through direct and indirect sources in Sicily's inner areas (Campisi, 2018, 2020; Mamì, 2007, 2014, 2020); the diffusion of historic techniques on gypsum in Italy and Europe; the principal problems of its recovery and reconstruction of the productive processes; the principal studies on conservation procedures of these techniques.

Keywords: Inner areas; gypsum; historic techniques; sustainability.

Diffusion of traditional gypsum technology in central Sicily

Most of the urban settlements in the pre-modern era have been generally characterized by the use of building materials deriving from the surrounding area of their settlement.
In Sicily, the region that is the topic of this research, the main pre-modern building materials can be grouped together according to certain principles: lime and porous limestone with lime mortars and plasters; magmatic rocks (lavas and basalts), with or without brick elements with lime or gypsum mortars; sandstone, often argillous, bricks and lime mortars; and limestone, porous limestone or sandstone with gypsum mortars and plasters. This last type characterizes the central part of Sicily. The central part of Sicily, geologically, constituted the so-called chalky-sulphurous series of the Messinian period, when the Mediterranean Sea became a closed basin, causing the deposition of different salts in solutions (Fig.1).
In an extensive study on the widespread use of this material in Sicily (Mamì, 2007), a great

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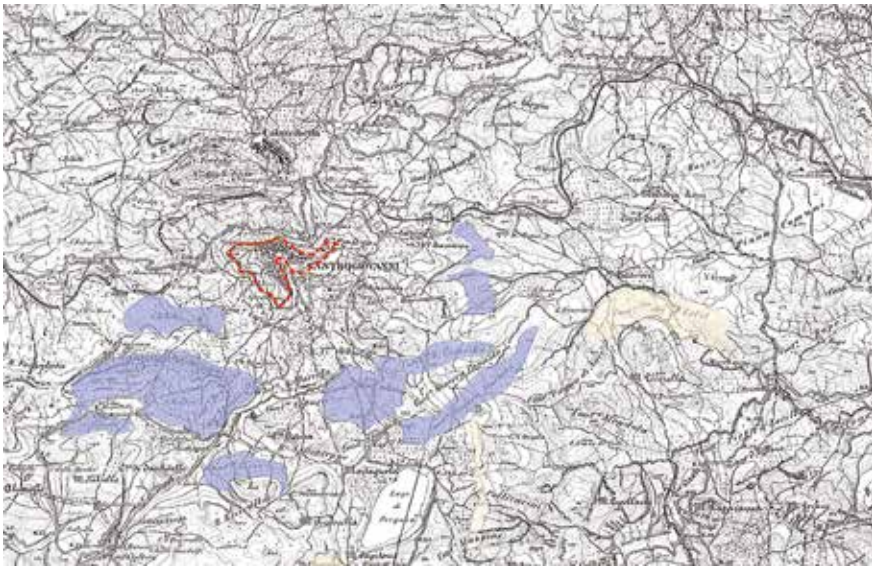

Fig. 2
The gypsum quarries localities found in the city of Enna, with the previous name of Castrogiovanni, (in light purple), and the traced quarries localities for lime mortar (in light yellow), on Igm topographical map of Enna (once called Castrogiovanni) from 1895. Image processing by M. T. Campisi.

number of historic built heritage in gypsum in the region has been classified in some small urban centres close to the gypsum basins. The widespread use of this material and its techniques has been recently detected in the historical centres of Caltanissetta and Enna (Campisi, 2018).

Fig.3
Enna. Comparison between a dark alabaster sample used for columns of the city Dome and a sample found in a quarry close to the city.

The cities of Caltanissetta and Enna. Compared researches through literary and archival sources, on site architectural surveys and investigations

The research project on the use of gypsum technologies in the Enna and Caltanissetta centres has been conducted by the cross-reference of compared information, by indirect sources (archival research), architectural survey and investigation in open spaces. Researches on quarries found in some early 19th-century archival documents of mines have been conducted, thus identifying them on a historical topographic map from 1895.
The comparison with current geological maps and a few on site inspections have allowed locating the sources of the materials (Fig. 2).
The information so acquired has also been crossed with a bibliographical source of a Sicilian naturalist of the same period that allowed confirmation of the previous data[1]. In

[1] See Alessi, 1825.

reference to Enna, this text also provided information on the different types of gypsum rocks in the territory: a light and dark alabaster, selenite, 'balatino', and 'bolliforme' gypsum. The same source contains information about this type of usage in the buildings, like the employment of dark alabaster in 16th-century columns of the city's dome (Fig. 3), in external and internal pavings and stairs; for gypsum mortars in external renderings and as bedding mortars in masonry, where earth mortars were also used.

Certain surveys of some building units in the historic centre have allowed verifying the employment of the material in technologies of vaults, floors and roofs.The vaults are carried out with a gypsum casting and medium-sized pieces of local porous limestone. (fig. 4). The wooden floors have been carried out with wooden beams with upper gypsum casting to form a ceiling in small vaults shape. In some examples, the beams are placed with the main axis on the diagonal to form a continuous surface at the intrados (fig.5, 6).The roofs are carried out either with reeds mats on the wooden beams or with a secondary structure of halves '*ginelli*', little trunks cut in half, with the flat face layed to the beam above covered with a gypsum screed (Fig.7). Consultation of 18th- and 19th-century documents in the historical archive [2] has highlighted the use of gypsum casting in the false vaults constructions; as bedding mortars in walls; for the construction of lightweight partition walls.

Instead, in the city of Caltanissetta, even though some techniques are similar to the previous ones illustrated (roofs and vaults), there are differences in wooden beam floors. These are carried out with slender wooden beams placed on the short side, with reeds mats above

[2] A historic report of building works and bill of quantity of 18th-and 19th-century has been consulted in SAE (State Archive of Enna).

Fig. 4
Vaults in gypsum casting in a historic building unit in the centre of Enna. Are visible the trace of the planks used for centring.

or with a secondary structure of halves 'ginelli'and a final gypsum screed. Another type is constituted with the same structure in halves 'ginelli' and curved clay tiles between these, with a gypsum screed (Fig. 8).

However, in this city, gypsum is widely employed as external rendering and as bedding mortar in masonry. In exterior facades, there are two main rendering types: the first one, in gypsum mortar and a finishing layer constituted by a layer of lime mortar, perhaps of lime milk; the second one, in a single layer, where gypsum crystal of medium thickness can be seen. A Mineralogical analysis in the bright section shows the layers' composition of the first example (Fig.9).

In 19th-century historical documents, the use of gypsum is cited in foundation walls, vaults, floors and roofs; as bedding mortars in masonry; as paving in the interior. The habit of reusing pieces of gypsum, deriving perhaps from the demolition of pre-existing constructions, called '*gessotti*', in the construction of vaults is interesting. A Sicilian scholar has also conducted a study on gypsum plasterers, techniques and structures for gypsum production. The furnace types described, called '*carcare*', are generally constituted of a circular plan structure with a dome covering[3].

[3] See Castiglione, 2012.

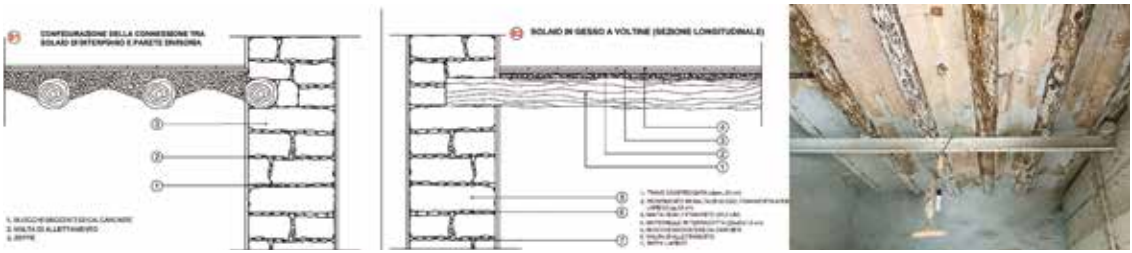

Fig. 5
Enna. Historic building unit. Example of a wooden floor carried out with wooden beams and upper gypsum casting to construct a ceiling in small vaults form. (survey and drawings by Francesco Paolo Capizzi).

Fig. 6
Enna. Historic building unit. Example of a wooden floor carried out with wooden beams placed with the main axis on the diagonal to form a continuous surface at the intrados. (survey and drawings by Federica Alessandra, Marina Turnaturi).

Gypsum basins and historical use in Italy and Europe (Spain, France, England). An international network of gypsum traditional technologies and sustainable materials

Traditional gypsum technologies have been documented in various areas of European countries in the small urban centres close to gypsum deposits.

The gypsum like building material can be found in other regions of Italy, as well as in many European countries (Spain, France, England). In Italy, the traditional gypsum technologies characterize, besides Sicily, Emilia- Romagna, Abruzzo, and Marche; to a lesser extent,

Fig. 7
Enna. Historic building unit. Solutions for roofs. With reed mats on wooden beams, and with halves 'ginelli' on wooden beam, and a layer of gypsum mortar at the intrados.

some localities in Tuscany, Lazio, Apulia, Campania and Calabria. The technologies employed in all of Italy show many similarities, as well as some differences, although sharing a similar approach to the use of gypsum and lightweight, renewable vegetable materials. In Abruzzo, little crossed branches of hazelnut wood and hazelnut shell with gypsum casting, known as *fraticcio*[4], have been employed in masonry; in Enna, Cerro's trunk[5], a wood of the oak family; in Emilia Romagna poplar wood. Hazelnut and poplar wood has generally been cultivated in coppice, another factor of renewable use. In Palermo, Caltanissetta, and Gangi the solutions with halves 'ginelli' are used in wooden beam floors; in Gangi pieces of cork for wooden beam floors with gypsum casting are used to form little vaults[6]. A gypsum re-employment material, deriving from dismantling of previous constructions, is known as *gessotto* in Sicily, and as *bizcocho*[7] in Spain. The construction of timber slabs with gypsum casting to form little vaults unites Sicilian and Spanish examples in the Valencia region[8], while the Piedmontese examples, in the wooden beam floors are very different[9].

Fig. 8
Caltanissetta. Historic building unit. Solutions for wooden beam, with a secondary structure in halves 'ginelli' and curved clay tiles between these, with a gypsum screed (survey and drawings by Giuseppe Bascetta, Antonino Lombardo).

Structural use of gypsum casting is registered for the construction of bearing walls, pillars or real vaults in Sicilian (Mamì, 2007;Campisi 2018), Calabrian (Monteleone, Alfieri, et alii, 2013), and Spanish cases (Vegas, Mileto, et alii, 2010; La Spina, 2016). The use for interior and exterior pavings affects Sicilian, English and French examples[10].

[4] In Bianchini, 2011, 159.
[5] This information is contained in a 19th-century document in SAE (State Archive of Enna).
[6] In Mamì, 2007, 59/61.
[7] In La Spina, 2016, 119-120.
[8] In Mileto, Vegas, Diodato, 2013.
[9] See Musso, 2011.
[10] For the English type see, SPAB, *Gypsum plaster floors. Regional technical advice note*, SPAB, London 2018; for the Spanish, see La Spina, 2016, pp. 117-119/139; for Sicily citations in historical documents have been found, see Campisi 2020, 71.

Use of gypsum mortars for external rendering is found in Spanish, French, and Sicilian examples. In Spain two different application forms in external renderings can be seen: one concerning external renderings used in vernacular settlements and a second one used in the exterior facades in medium-large urban centres like Valencia. In the first case, there are more similarities with Sicilian examples, characterized generally by a single layer, or more not very thick layers.[11] Natural coloured gypsum mortar has been found in Spain, in Albaraccin[12], in Aragona, like in French rural centres of Provence, Corbieres, Herault[13], as in Albaraccin, where furnaces for traditional production are still active.

Instead, external renderings of great thickness were used in Spain, in Valencia, and in France on Ile-de- France facades[14]. In France use of gypsum in external renderings is recorded on 18th-century facades in the Ile-de-France region, placed among the listed buildings by CRMH, together with the recent preservation of the gypsum-based vernacular heritage[15].

[11] In Mamì, 2007, p. 108-112. For Spain see Sanz Arauz, Villanueva Domínguez, 2009, and la Spina, 2015.
[12] For Alabaraccin material characteristic, see David Sanz Arau, 2004; 2009.
[13] See G.P.R.A., 2016.
[14] For Valencia, see La Spina, Fratini,at alii, 2013; for the French studies, Le Dantec, 2016.
[15] See, for instance, Inizan C., *Plâtre. Sols et couvrements intérieurs. Du XIIIe au XIXe siècle*, Editions du Patrimoine, Paris 2017.

Fig. 9
Caltanissetta. Typology of gypsum external renderings and characterization in thin-section and bright-section. The thin layer of calcite, perhaps a lime milk layer, can be seen in the bright-section.

Strategies for recognition and recovery. Gypsum system networks, multidisciplinary studies, integrated preservation project, recovery of traditional techniques and its manpower, operative manuals.

The gypsum thematic not only involves a very great number of countries and geographic areas in many parts of the world but it also represents a complex cultural system at different scales: natural environmental (gypsum parks), historic urban built heritage, building culture, industrial archaeology and also in the anthropology field. This system already represents a complex heritage with the potential of becoming an integrated resource for sustainable development in the areas distinguished by this feature, therefore with the possibility of turning into a common network of shared resources among more places and countries and perhaps even a shared field of multidisciplinary researches[16].

The gypsum technologies are characterized by the employment of recyclable, renewable and local resources; by the need of preservation of historic built heritage, testifying its historic usage; by its high-performance quality as well as by constituting a possible source, for example, for new building products, based on a gypsum-vegetable compound, and also for its preservation.

But this thematic demonstrates some criticality concerning common and generally shared negative preconceptions on its property and quality originating from the industrial transformation of material in the 20th-century, reducing it only to decorative applications; also with reference to the almost total extinction of traditional production and manpower, that makes the preservation of historic built settlement based on this technology difficult.

[16] Among experiences of this type in Italy, in Emilia-Romagna, see, Lucci, Piastra, 2015;in SicilyCastiglione, Giugno 2000.

All the studies on the traditional use of gypsum technologies have, indeed, highlighted the fundamental difference between the properties of traditionally produced mortars and the industrial ones[17].

The issue of preservation of the traditional gypsum heritage has been faced with different approaches. A more conservative one that is aimed at the experimentation of industrial recovery mortars, often composed of lime and gypsum minerals, but recently also with some traditional additive[18]; the second one, aimed at the reproduction of the traditional production system, in traditional furnaces, together with the recovery of the lost manpower.

In the first instance, the process should be addressed to an industrial solution with low impact on the local productive system; in the second one, the recovery of local manpower and production could have a greater effect on local economies, and allow to reemploy a material with better characteristics than the current industrial one. For the preservation of the aforementioned Ile-de-France gypsum facades of the 18th-century a specific protocol has been planned[19]. In Spain, some production, such as in Albarracin, has been reactivated, while a traditional factory near Valencia still exists. Experimentations led to a better knowledge of the traditional production process with the reconstruction of the furnaces and the replication of the productive process, thanks to the know-how of the older generation of workers, demonstrating the possibility of productive process replication[20]. The diffusion of studies, the editing of operative manuals for application techniques[21], manpower training also through the building workers' associations, can represent other useful tools aimed at the preservation of this historic built, technological and material heritage. But above all, there is the need to communicate the property, the quality and the value of these matters to the communities and local administrations to guarantee a future preservation process of 'gypsum heritage'.

[17] For these studies see, in Italy, Accurti, Baronio, et alii, 2001, in Spain, Bel-Anzué, Almagro,et alii, 2017.
[18] See Middendorf, 2002; 2015, for the first example; Brunello, Bersani, et alii, 2020, for the second one.
[19] See Schmuckle-Mollard, n.d.
[20] See note 17.
[21] Examples can be represented by operative manuals of English Heritage (Practical Building Conservation series), and by experience conducted in Valencia (Mileto C., Vegas F., *Aprendiendo a restaurar. Un manual de restauración de la arquitectura tradicional de la Comunitat Valenciana*, 2017).

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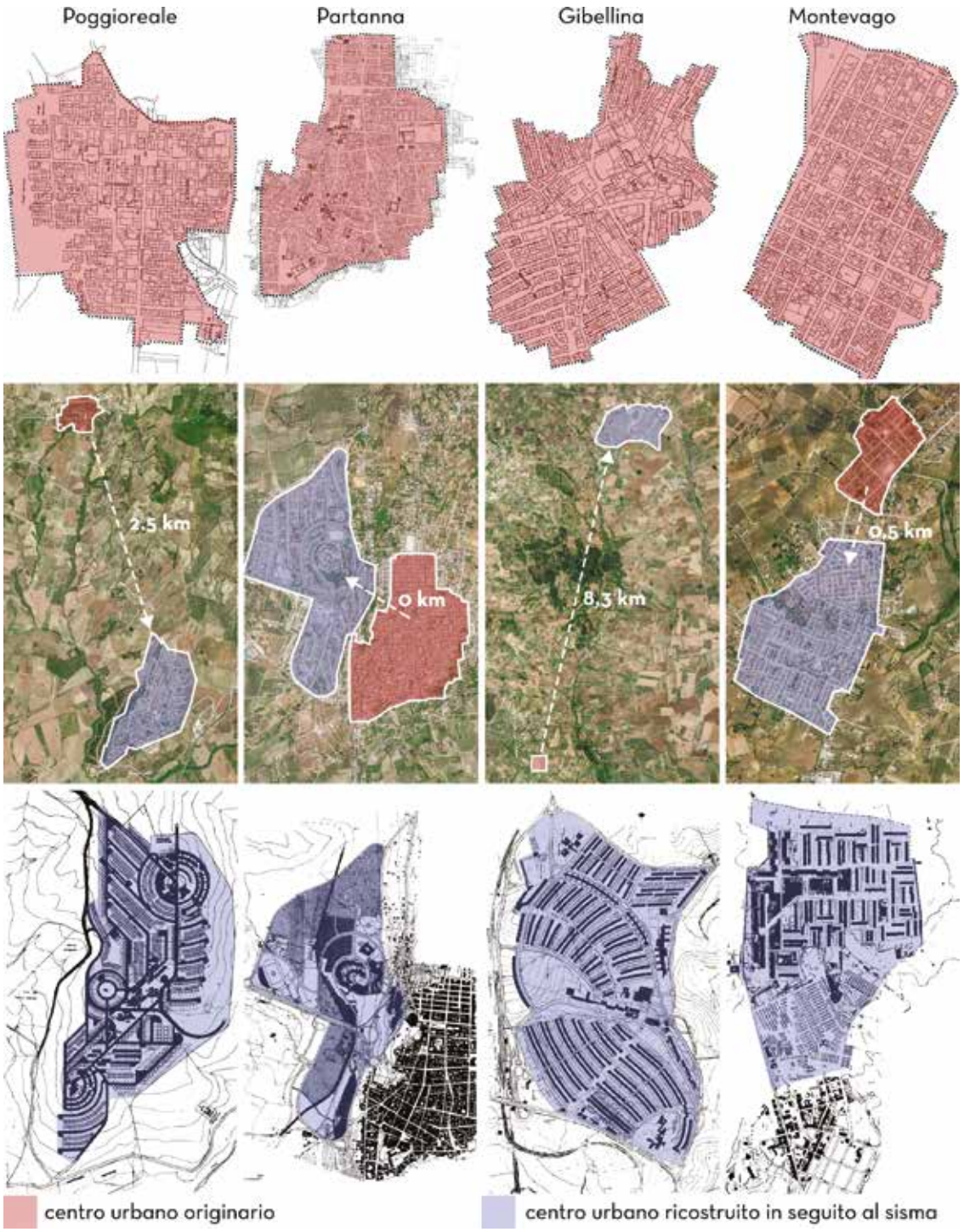
Poggioreale
Partanna
Gibellina
Montevago
2,5 km
0 km
8,3 km
0,5 km
centro urbano originario
centro urbano ricostruito in seguito al sisma

EXPLORER LES VILLES ABANDONNÉES, PRÉSERVER LA MÉMOIRE DES LIEUX: LE CAS D'ÉTUDE DE SANTA MARGHERITA DANS LA VALLÉE DU BELICE EN SICILE

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Les plans de reconstruction de Poggioreale, Partanna, Gibellina et Montevago.

On January 14, 1968, a strong earthquake struck the southwest of Sicily. The seism caused the collapse of almost all the buildings in the villages of Gibellina, Poggioreale, Salaparuta, and Montevago and seriously compromised the viability of Camporeale, Contessa Entellina, Menfi, Partanna, Roccamena, Salemi, Santa Margherita, Santa Ninfa, Sambuca and Vita. The fourteen municipalities adopted different reconstruction strategies. The four most affected were re-established on new sites, very far from the old centers; the other ten recovered the ruins in various ways by integrating them to new urban fabrics. In this context, the case of Santa Margherita is emblematic, because the new city was built in continuity with the old one, still recognizable today. The demolitions, therefore, did not affect the whole town and some sections have been since then preserved in their ruined state. Today, a large part of the population feels the need to repossess the houses abandoned for decades, still custodians of the material and immaterial history and culture of the community. These places represent a strong identity element and an important link with their past which risks disappearing while it could be a revitalizing element for a region in the process of depopulation. Based on careful research and surveys conducted on the site, this work aims to analyse the current state of the ghost city to support sustainable and inclusive recovery choices, compatible with the cultural roots of the concerned population.

Mots-clés: patrimoine bâti, connaissance, conservation, revitalisation, centres abandonnés

Introduction

Le 14 janvier 1968, un fort tremblement de terre a été enregistré dans le sud-ouest de la Sicile. Ce fut le début d'un essaim sismique caractérisé par des mouvements telluriques de forte intensité qui feront trembler la vallée du Belice pendant plusieurs jours, jusqu'au dernier choc violent du matin du 25 janvier. Un événement destructeur - d'intensité égale à 10 sur l'échelle macrosismique Mercalli-Cancani-Sieberg - qui entraînera l'effondrement de presque tous les édifices des villes de Gibellina, Poggioreale, Salaparuta et Montevago et compromettra sérieusement la viabilité de Camporeale, Contessa Entellina, Menfi, Partanna, Roccamena, Salemi, Santa Margherita, Santa Ninfa, Sambuca et Vita (Fig. 1).

Les quatorze communes adopteront différentes stratégies de reconstruction. Les quatre plus touchées seront rétablies sur de nouveaux sites, très loin des anciens centres ; les dix autres

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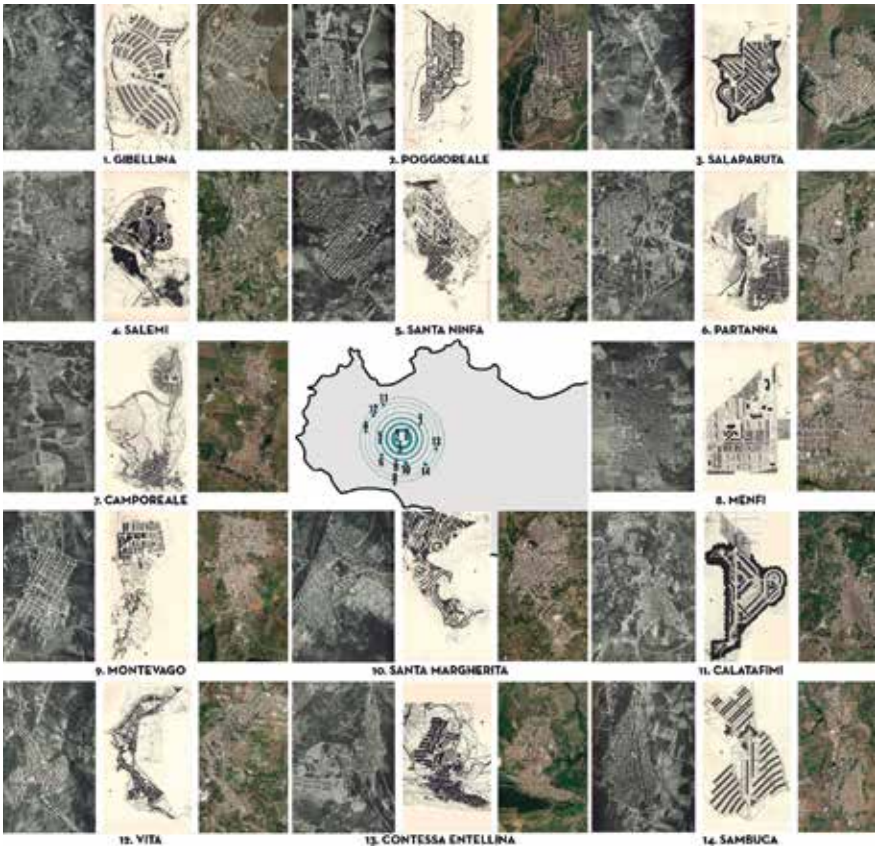


Fig. 1
Les villages de la vallée de la Belice frappés par le tremblement de terre de 68.

récupéreront les ruines du tremblement de terre de diverses manières en les intégrant - parfois seulement en partie - aux nouveaux tissus urbains.

Dans ce contexte, le cas de Santa Margherita est emblématique, car une *new town* a été édifiée en prolongement de la vieille, aujourd'hui toujours reconnaissable. En effet, contrairement à ce qui s'est produit dans les autres municipalités intéressées par des transferts totales ou partiels avec reconstruction sur place en faisant table rase de ce qui restait des structures d'origine, le vieux centre a été presque complètement délaissé et la majeure partie de la reconstruction a eu lieu dans des zones voisines. Les démolitions n'ont donc affecté la totalité de la ville et des sections entières sont depuis restées dans un état de ruine.

Aujourd'hui, la grande partie de ses habitants ressentent le besoin de reprendre possession des maisons abandonnées depuis des décennies, encore dépositaires de l'histoire et de culture matérielle et immatérielle de la communauté. Ces lieux représentent un élément identitaire fort et un lien important avec leur passé qui risque de disparaître alors qu'il pourrait au contraire être un élément revitalisant pour une région en voie de dépeuplement.
Basé sur des recherches et des enquêtes minutieuses menées sur le site - malheureusement entravées par la survenance de la pandémie de coronavirus - ce travail vise à analyser l'état actuel de la ville survivante, afin de soutenir des choix durables et inclusifs de récupération, compatibles avec les racines culturelles de la population concernée.

La Vallée du Belice entre destruction et stratégies de reconstruction

Celle du Belice est une histoire d'existences, deuils, cicatrices ; d'espoirs insatisfaits et expérimentations audacieuses. Un endroit déjà difficile, faisant partie d'un arrière-pays sicilien très pauvre et trop longtemps oublié et livré à soi-même, bouleversé par l'événement sismique et transformé en quelques secondes en tas de gravats et désespoir.
Comme dans d'autres situations similaires vécues par le fragile territoire italien ou ailleurs dans le monde, la catastrophe change à jamais les vies des habitants. Ceux-ci perdent soudainement leurs repères spatiaux, remplacés par des traumatismes qui sapent fortement leur identité et leur capacité à se situer dans l'espace et le temps. Leur équilibre mental est altéré par la perte d'objets familiers, de meubles, de pièces et de maisons qui n'existent désormais que dans leur mémoire ; par l'annulation de rues, de places, de monuments qui appartiennent à une réalité qui n'est plus. La calamité devient donc un élément de césure par rapport à cette continuité historique à partir de laquelle ces lieux et ces villes avaient été bâtis et sur lesquelles les différents groupes sociaux, qui l'avaient traversé, avaient établi leur mémoire collective.
Dans le Belice, le tremblement de terre frappe et arrête brutalement la croissance et le développement du territoire. Les villes nées à l'époque médiévale comme châteaux ou fermes fortifiées (Contessa Entellina, Gibellina, Salaparuta, Menfi, Partanna et Salemi, Sambuca) ou au cours du XVIIe siècle en fonction de l'exploitation agricole (Poggioreale, Montevago, Camporeale, Roccamena, Santa Margherita, Santa Ninfa et Vita) avaient connu, au fil des siècles, une croissance constante de la population. Une tendance inaltérée entre 1861 et la Grande Guerre et qu'après un moment de stase, à la suite de la réforme agraire, avait connu une nouvelle augmentation. À la suite du séisme, la population du Belice avait subi une réduction soudaine : une inversion de la courbe qui malgré la reconstruction - à quelques rares exceptions près, dont Santa Margherita - a depuis demeurée inchangée (Fig. 2).

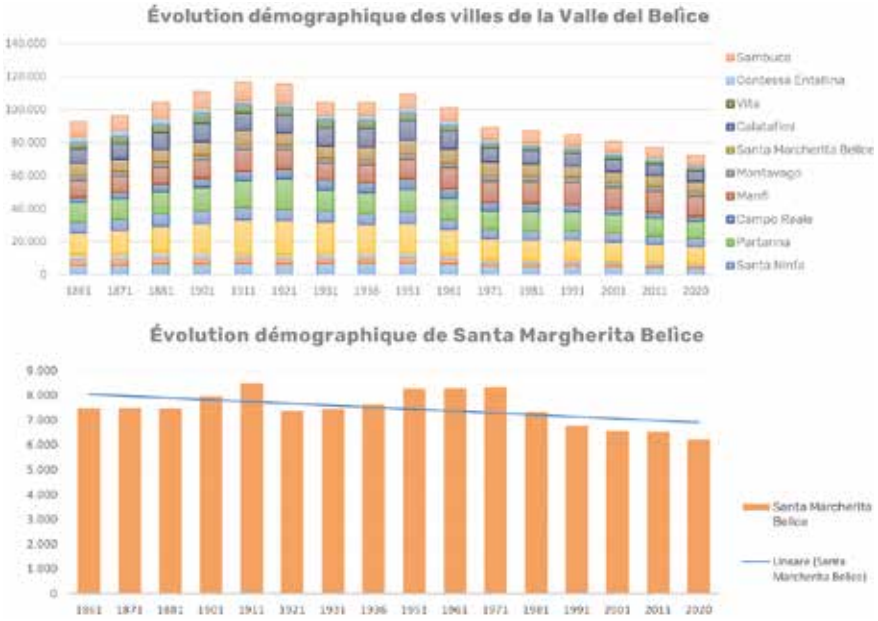
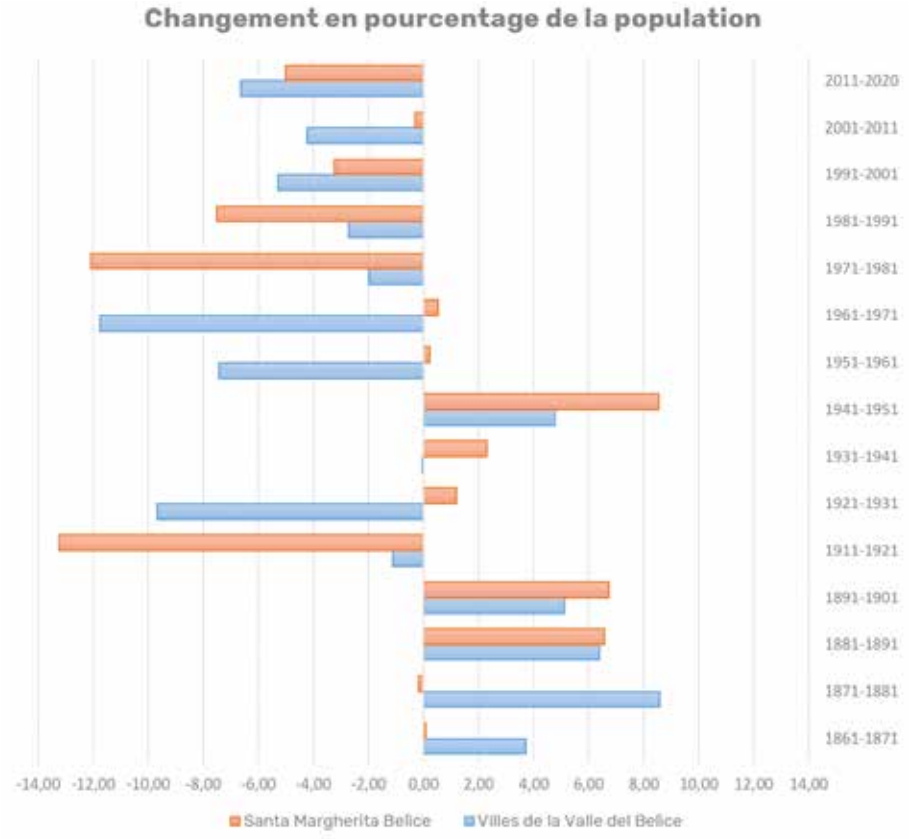


Fig. 2-3
L'évolution de la population dans les communes du Belice et à Santa Margherita dans la période 1861-2020.

Cette dernière se révèle être un processus fort complexe et semé d'embûches. S'il était initialement établi que les habitants des zones touchées auraient pris part aux choix stratégiques, une série de raisons bureaucratiques et des barrières administratives, mais, surtout, de féroces intérêts économiques feront en sorte que cet objectif ne soit pas respecté. Après environ dix ans pendant lesquels la population est obligée de vivre dans des bidonvilles, « dans une condition de quasi-nomadisme entre le pays détruit, le pays provisoire et le pays à venir » (Aprile 2009, p. 224), l'État entame les travaux de reconstruction en intervenant à des titres divers sur le patrimoine architectural et urbain des villes sinistrées. En frappant contraste avec les objectifs déclarés de rédemption du territoire et de participation de la population aux choix stratégiques, il impose d'en haut des solutions 'raffinées', mais, hélas, éloignées des besoins d'une collectivité déjà très affaiblie dans sa conscience et dans ses traits constitutifs.

La catastrophe met en évidence le retard accusé par l'ensemble de ce territoire, l'insuffisance de ses infrastructures, ses maisons délabrées, la pauvreté de ses habitants et une certaine absence/indifférence de l'État qui accompagnera également la phase de reconstruction, la transformant en l'un des plus sombres et douloureux chapitres de toute l'histoire sicilienne. Ainsi « la vallée du Belice, territoire de collines et de pentes douces et



vertes, a été transformé par une catastrophe naturelle […] en un lieu de raids et de vols par administrateurs, politiciens, spéculateurs qui se sont jetés comme des chacals sur une proie qu'il fallait plutôt guérir, sauver, restaurer pour qu'elle puisse vivre » (Renna, De Bonis & Gangemi 1979, p. 117).

L'ensemble de l'opération aura donc des résultats très contradictoires ; dans trop de cas, les nouveaux milieux construits ne deviendront jamais 'signifiants' aux yeux de la population. La séparation imposée entre un 'avant' et un - par ailleurs incertain - 'après', ainsi rejetant le côté polysémique inhérent à l'évolution naturelle des villes, générera une certaine immobilité et un sentiment de dépaysement dans les nouvelles implantations, les privant de la beauté souhaitée (Haidar 2006). Comme l'affirme Françoise Choay « quels que soient les objectifs des constructeurs de la cité, qu'ils soient dominés par une idéologie progressiste ou

Fig. 4
La reconstruction de Santa Margherita (vues aériennes avant le séisme del 1968, après et aujourd'hui).

culturaliste, il faut encore que les intentions apparaissent, soient déchiffrables pour les habitants. Aucune pratique des arts plastiques, aucune connaissance de la géométrie, ne peut conduire la conception d'un projet lisible ; seule le peut l'expérience de la ville » (Choay 1965, p. 73). Une intelligibilité et une compréhension du processus dont les gens du Belice ne bénéficieront pas…

De toute manière, on rétablit Poggioreale un peu plus en aval, posé sur une immense place postmoderne dessinée par Paolo Portoghesi tandis que les ruines de la vieille ville dévastée restent visibles, presque cristallisées ; ruines 'modernes' qui sont encore entre la vie et la mort dans une collision anachronique constante qui dénonce une ancienne vivacité urbaine, encore perceptible, mais désormais lointaine.

Si un nouveau quartier est fondé à Partanna à un niveau plus bas par rapport à la ville historique, la nouvelle Salaparuta, conçue par Marcello Fabri, s'élève dans une zone plate sur la colline au-dessus, à quelques centaines de mètres de la rive du Belice.

Gibellina renaît à dix-huit kilomètres de l'ancien site : tout en refusant les éléments de l'architecture traditionnelle des villages de la Sicile Orientale, la nouvelle ville se construit autour d'une image urbaine plus dense et créative, étudiée par de grands architectes et artistes de l'époque. Afin de garder le souvenir du désastre, on érige sur l'ancien site de la ville un monument au tragique événement : la ville antique est recouverte d'un linceul blanc - le *Cretto* d'Alberto Burri - et donc, à jamais, muséalisée.

Aussi, à Montevago, on choisit de reconstruire le nouveau centre urbain en prolongement de l'ancien, livrant aux habitants un projet caractérisé par des qualités architecturales et urbaines totalement étrangères à la culture locale. Quant aux quelques reliquats échappés à l'enlèvement des gravats par les bulldozers, ils sont encadrés dans un triste et désolé parc commémoratif (Fig. 3).

En ce qui concerne S. Margherita, comme déjà anticipé, le centre urbain d'aujourd'hui se situe pour un peu plus de la moitié de son extension sur de nouvelles zones urbanisées, soustraites à l'agriculture, où l'*Istituto per lo sviluppo dell'edilizia sociale* (ISES) a érigé une ville nouvelle, caractérisée par un design moderniste courbe qui s'adapte à la topographie du terrain. La portion restante insiste sur une partie du centre ancien où les anciens vestiges ont été démolis pour laisser la place à de nouvelles urbanisations (Fig. 4). La typologie architecturale dominante est représentée par des maisons unifamiliales mitoyennes, érigées sur des lots de différentes tailles.

La nouvelle Piazza Matteotti, dominée d'un côté par l'ancienne *Chiesa Madre* et le *Palazzo Filangeri-Cutò* - une fois habitée par le célèbre écrivain Tomasi di Lampedusa - et de l'autre par la *Palazzata* sépare la nouvelle et la vieille ville et constitue une zone intermédiaire qui a vu s'établir dans les dernières décennies d'importants travaux de restauration sur les bâtiments les plus importants, tout en laissant en arrière-plan un habitat 'mineur' très délabré (fig. 5).

Enfin, sur la pente de la colline, les anciens quartiers de San Vito et San Calogero, fondés sur deux grands axes perpendiculaires l'un à l'autre (via Calvario en direction est-ouest et via Cesare Battisti, en direction nord-sud), persistent bien que dans un état de grande précarité, grâce à une résilience vraiment surprenante (fig. 6). Une condition favorisée par l'établissement d'une zone de protection qui soumet toute activité de reconstruction à la définition d'un plan de relance qui, toutefois, n'a jamais vu le jour. Un véritable musée à ciel ouvert qui mérite d'être réintégré dans la vie actuelle de la ville, de manière consciente et consciencieuse, c'est-à-dire à partir de processus de connaissances approfondies, à ce jour jamais menées.

Fig. 5
La Piazza Matteotti dans la première moitié du XIXe siècle, dans les années qui ont suivi le tremblement de terre et aujourd'hui.

Fig. 6
Les ruines des quartiers de San Vito et San Calogero.

La documentation numérique pour la connaissance et la valorisation des centres historiques

La ruine «c'est le temps qui échappe à l'histoire: un paysage, un mixte de nature et de culture qui se perd dans le passé et surgit dans le présent comme un signe sans signifié, sans autre signifié, au moins, que le sentiment du temps qui passe et qui dure à la fois» (Augé 2003, p. 86). L'étude du passé historique est donc nécessaire pour comprendre notre contemporain et, comme dans le cas des villes détruites, pour reconstruire le processus évolutif jusqu'au moment dans lequel la tragédie s'est produite. Le passé nous indique la direction pour avancer, car aucune vraie reconstruction n'est possible sans mémoire.

Le grand tremblement de terre de 1968 apparaît comme une grande cicatrice dans l'ensemble du territoire du Belice qui matérialise une fracture temporelle dans le processus de développement naturel et harmonieux de ce lieu. Il s'agit d'une empreinte du temps qui doit être documentée du point de vue social, culturel et symbolique, mais aussi physique, et cela à travers l'étude métrique et matérielle de ce qui a résisté à la force dévastatrice de la nature. Seulement l'intersection des deux composantes tangibles et intangibles permettra de comprendre la vraie dimension locale des lieux, de reconnecter l'avant et l'après et donc de

Fig. 7
Le relevé photogrammétrique aérien: les ruines du quartier de San Vito qui, cristallisées par l'événement tellurique, permettent la lecture de la texture urbaine des îlots et la compréhension technique et constructive des bâtiments.

Fig. 8
Plan des quartiers de San Vito et San Calogero avec indication des unités de construction individuelles et des essences d'arbres.

planifier des interventions de conservation et régénération du tissu urbain réellement efficaces (Fabietti, Giannino et Sepe, 2013).

La documentation systématique des dommages causés au patrimoine architectural des zones touchées par le séisme en Italie n'a commencé à se consolider que dans la seconde moitié des années 1980. L'adoption d'un système de catalogage à la fois graphique et textuel des bâtiments endommagés a été pour la première fois testée lors du tremblement de terre dans les Abruzzes (1984). Toutefois, ce n'est qu'après le séisme en Ombrie et dans les Marches (1997) qu'il a été possible de s'appuyer sur un méthodologie structurée - mise en place par des techniciens qualifiés de la protection civile, du Ministère de la Culture, des universités et des associations professionnelles - visant à l'évaluation fiable, rapide et uniforme de la capacité portante de chaque bâtiment dans les îlots concernés (Bartolucci et Trizio, 2015).

Les modalités d'analyse graphique sur le terrain - tels que les croquis attachés aux descriptions des ouvrages et de leur utilisation, données essentielles pour comprendre les caractéristiques géométriques et typologiques ainsi que l'ampleur des dommages visibles

sur les structures et procéder à une estimation des risques d'effondrement - ont évolué au fil des années. Cela grâce au développement progressif des méthodes et des techniques de relèvement automatiques rapides, aujourd'hui capables de restituer des modèles tridimensionnels toujours plus précis et de manière de plus en plus rapide (Calantropio et al., 2018). Un outil visant, tout d'abord, à vérifier les possibilités d'utilisation et à sécuriser les structures, qui constitue aujourd'hui une grande base de données d'informations essentielles.

La reconstruction du Belìce n'a hélas pas pu profiter de la révolution numérique, car dans ces années-là était bien loin d'être commencé; les pratiques de relèvement post-catastrophe, lentes et coûteuses, ainsi que les rares représentations des états des lieux réalisées par des architectes - vues malheureusement raccourcies qui ne sont pas exhaustives dans les contenus techniques et constructifs -, n'ont pas contribué à la création d'une archive des effets des dommages de l'événement tellurique.

L'exigüe documentation technique sur l'état du patrimoine avant et après le séisme, suite également à la perte des archives, a sérieusement compromis notre conscience actuelle des villages; les images aériennes des zones dévastées, les chroniques de l'époque et les

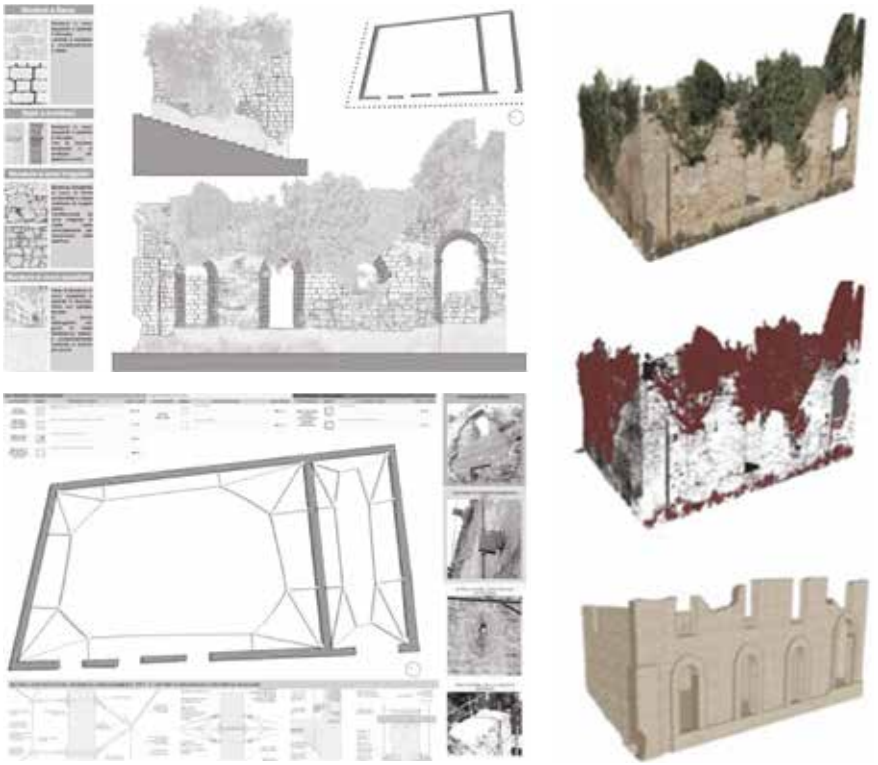


Fig. 9
Projet-pilote concernant le bâtiment «Casalini»: évaluation des dommages, propositions de mise en sécurité et de nouvelle utilisation.

Fig. 10
Rendering 3D du projet-pilote.

photographies historiques (en nombre limité par rapport à ce qui est possible aujourd'hui grâce à l'utilisation de films) sont les rares sources d'étude et de recherche disponibles.
La reconstruction des parcelles urbaines des villages de la vallée n'est possible que par des photos aériennes, suffisantes pour l'étude au niveau des blocs, mais inadéquate pour donner des informations détaillées sur les bâtiments. Les choix d'urbanisme liés à la reconstruction ont détruit, dans de nombreux cas, les témoignages que les tremblements de terre avaient épargnés. Le cas emblématique de Gibellina Vecchia, dont les restes sous une œuvre de *land art* très captivante, mais irréversible, a effectivement annulé toute possibilité d'étude directe sur les restes. Un sort commun à de nombreuses communes touchées par la reconstruction à l'exception de quelques-unes.
Santa Margherita est un cas d'un grand intérêt, car c'est toujours possible de lire l'ancienne *forma urbis*, caractérisée par une maille régulière avec de grands blocs constitués d'unités de construction de 'maisons avec cour' à une ou deux élévations; un système

articulé qui s'étendait au nord du bassin de la grande place jusqu'à la crête de la montagne, dominant ainsi la vallée.

Une situation favorable à l'élaboration de nouvelles études visant à établir des projets qui permettent d'un côté de s'approprier des ruines - aujourd'hui difficiles à comprendre en raison de l'état avancé d'instabilité - afin de reconstituer un ensemble de connaissances qui fait défaut aujourd'hui et de l'autre, de les intégrer dans un lieu de mémoire 'vivant' au profit des habitants et des touristes.

Sur la base de ces hypothèses, une activité d'investigation a été lancée visant à documenter les techniques et les systèmes constructives du bâti de Santa Margherita, avant que la négligence et le temps n'effacent à jamais ce qui encore subsiste ; si cinquante ans se sont écoulés depuis le séisme, ce qui reste des anciens quartiers permet encore la reconnaissance des maçonneries, des éléments voûtés et d'une partie - certes petite, mais significative - des éléments des charpentes en bois.

C'est ainsi que les premières inspections ont permis de procéder à un relevé 3D au scanner laser intégré par une reconstruction photogrammétrique automatique sur base de multiples images, à la fois terrestre et aérienne. L'établissement d'un réseau topographique sur le

périmètre extérieur et tout au long des deux grands axes perpendiculaires qui traversent les deux quartiers ont permis de géoréférencer les différentes acquisitions.
Les images zénithales acquises avec un petit drone (Fig. 7) ont consenti de restituer un plan précis de l'état des lieux - dans la tolérance requise pour une échelle de représentation 1 : 200 - qui a pu être enrichie avec l'indication des effondrements et des dépôts de gravats. Une base métrique et documentaire qui a permis de redessiner les plans de rez-de-chaussée de chaque îlot afin de déchiffrer la complexe structure de distribution des unités de construction et les relations interne/externe et public/privé (Fig. 8). Deux élévations-coupes établies au long des axes principaux sur la base des projections orthographiques des modèles 3D, ont offert l'opportunité de restituer les élévations des bâtiments individuels, ainsi que de créer un abaque des éléments constructifs et décoratifs caractérisant les deux quartiers.
Enfin, des enquêtes détaillées ont été globalement menées pour des bâtiments d'une valeur monumentale historique particulière, tels que le soi-disant 'Casilini' (Figs. 9-10). Cette étude de cas, à partir d'une enquête documentaire visant à établir un dossier exhaustif retraçant l'origine, l'histoire et l'évolution du bâtiment ainsi que ses caractéristiques techniques et son état de dégradation, a permis de mettre en place un projet pilote pour sa mise en sureté et sa future utilisation qui pourra être plus tard répliqué dans l'ensemble du quartier.

Conclusions

Au cours des dernières décennies, la ville de Santa Margherita a pu redécouvrir les splendides traditions enfouies par le tremblement de terre, les combinant avec un désir de progrès et d'avant-garde, renaissant de la poussière et se développant à côté de la vieille ville qui représente son lien avec le passé. Le processus de connaissance et de récupération entamé par cette recherche, que nous espérons pouvoir bientôt continuer, pourra faciliter la régénération de l'ancien centre grâce à l'établissement de nouvelles fonctions, en le soustrayant à une annulation autrement certaine.
L'objectif est de proposer la création d'une sorte de centre d'interprétation, ne présentant ni objet ni collection, mais permettant au visiteur de suivre un cheminement explicite, historique et pédagogique dans le parcours d'une exposition permanente — constituée par l'ensemble des bâtiments consolidés — afin de restituer les caractéristiques émotionnelles et mémorielles irremplaçables du village d'autrefois horriblement martyrisé.

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Castiglioncello, maquette d'ensemble de la vallée del Santerno et de l'arête où est situé le village, échelle 1:500, travail des élèves du Laboratorio di Progettazione dell'Architettura IV, années 2016-2017.

Castiglioncello and Castelnuovo are border realities between Tuscany, Marche and Emilia-Romagna, presented as paradigms of the peculiar villages of the central Apennines, genetically belonging to the ramified system of medieval castles, and closely connected to an agricultural economy or to the strategic control of communication routes. During the 20th century they have been affected by a progressive process of depopulation and abandonment.
The *forma urbis* of the two villages is characterized by the founding elements of civil and religious power, a primitive fortress and a small church. These are surrounded by the residential fabric, that has been shaped by the orography and by the family needs, staging a condition of reciprocity between town and agrarian landscape that is typical of these places.
This contribution is the result of a research led by Maria Grazia Eccheli at the Department of Architecture in Florence and aims to present the role of the architectural design as a knowledge tool, able to highlight structural features of a settlement through a new small scale architectural 'interlace' of conservation, integration, addition, volumetric juxtapositions, alternations of solids and voids.
Being able of reading such urban fragments it is possible to derive measures and rules of modern building and to achieve an architectural design suspended between old and new, not rhetorical or mimetic, nor fascinatingly contemplative, but responding with forms to contemporary life needs and resulting from a timeless, site-specific vocabulary.

Mots clés: villages, abandon, projet, réécriture

Préambule

La représentation du monde naturel, rappelle Pierre Bourdieu, ne possède rien de naturel ou d'objectif, il s'agit plutôt d'une construction sociale, d'une projection anthropologique et culturelle, fruit d'un croisement entre les regards de différents sujets qui représentent leur propre identité dans le temps et l'espace.
Les modalités de perception et d'interprétation du paysage construit, qui se mesurent aujourd'hui à l'histoire et à la géographie, à l'économie et à l'art, varient selon les contextes culturels dans lesquels elles sont formulées et leur spécificité est en rapport étroit avec la «hauteur sociale» (Bourdieu 1977, p.3) du point de vue qui les produit. La beauté et la richesse du paysage et des villages ruraux italiens, explorées dans leur complexité au sein des

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Fig. 1 Castelnuovo di Auditore, vue du village. Photographie de Claudia Cavallo, 2015.

Fig. 2 Castiglioncello di Firenzuola, vue du village. Photographie de Caterina Lisini, 2017.

pages éclairantes d'Emilio Sereni, à travers les études de géographie humaine de Lucio Gambi ou encore révélées par les vues poétiques du photographe Luigi Ghirri, apparaissent aujourd'hui aplaties dans le regard que la société urbanisée contemporaine porte sur le monde agraire, y projetant une ombre d'Arcadie perdue et mal comprise.

Rapportées à la dimension architecturale, les études passionnées de Bourdieu contiennent un enseignement profond sur l'importance du point de vue et d'un placement approprié de celui-ci face à la construction humaine du paysage, afin d'échapper à une vision abstraite et limitée voire esthétisante ou folklorique, qui en réduit la signification à un «paysage comme paysage, c'est-à-dire comme décor, paysage sans paysans, culture sans cultivateurs, structure structurée sans travail structurant, finalité sans fin, œuvre d'arts» (Bourdieu 1977, pp.3-4).

Villages abandonnés de l'Apennin central : genèse, caractères, état des lieux

Castiglioncello di Firenzuola et Castelnuovo di Auditore, réalités aux confins entre la Toscane, les Marches et l'Émilie-Romagne, s'offrent comme paradigmes d'un système de villages spécifiques de l'Apennin central, relevant génétiquement du phénomène

ramifié de l'enchâtellement médiéval, étroitement liés à une économie agricole ou au contrôle stratégique des voies de communication. L'emplacement de ces implantations, qui ont en commun d'être situées sur des arêtes abruptes à proximité de cours d'eau, en exprime la *ratio* fondatrice. Leur *forma urbis*, qui s'inscrit dans cette période d'invention urbaine que Benevolo reconnaît dans le Moyen-Âge européen[1], est marquée par les éléments fondateurs du pouvoir civil et du pouvoir religieux -souvent une forteresse primitive et une petite église-, autour desquels se développent les tissus d'habitats, composés d'unités auto-construites en maçonnerie de pierre locale selon l'agrégation progressive d'une cellule élémentaire de base. Des tissus qui s'articulent en suivant les formes suggérées par l'orographie du terrain et par les besoins de l'économie familiale, mettant ainsi en scène cette condition de réciprocité entre le centre habité et le paysage agraire caractéristique de la vie de ces lieux (Fig. 1, 2). Les habitants partis progressivement au cours du XXème siècle, l'activité agricole séculaire disparue, jusqu'aux moindres travaux d'entretien, le sens antique de la vie intime communautaire érodé, ce qu'il reste de ces villages sont des ruines instables, résidus de matières sans

[1] «L'epoca in cui l'invenzione degli organismi urbani è più vigorosa, audace, variata è certamente il Medioevo. […] Non è esagerato dire che la maggior parte delle città in cui viviamo furono inventate – per la parte essenziale – in epoca medioevale» (Benevolo 1968, pp. 21-22).

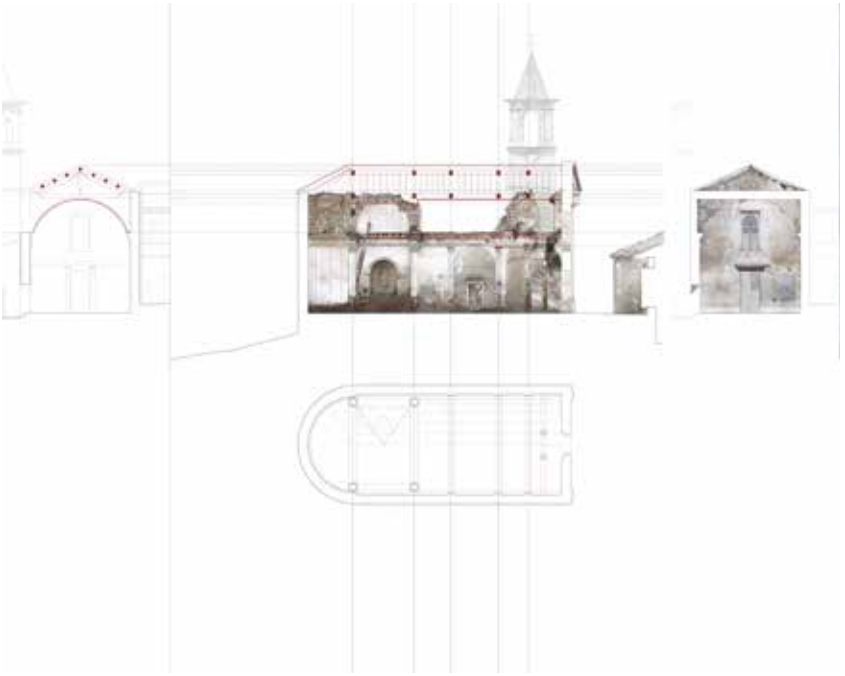
Fig. 3 Castelnuovo, réécriture typologique des maisons sur la pente, section du système d'escaliers superposés publics et privés. Mémoire de fin d'études de C. Cavallo.

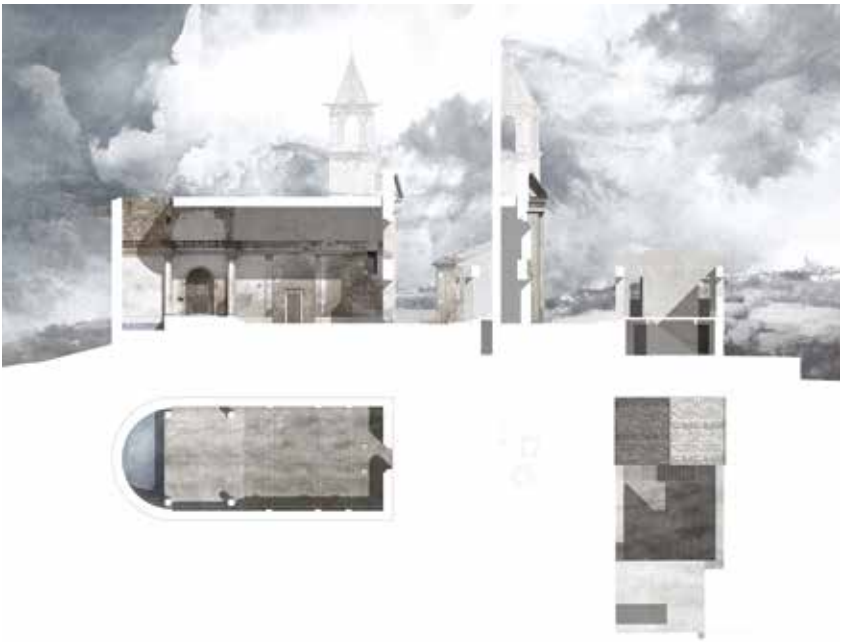
Fig. 4 Castelnuovo, l'église comme méridienne de lumière et de mémoire, une pièce à ciel ouvert faisant office de place. Relevé avec les formes de la spatialité du XVIIIème siècle et le projet. Mémoire de fin d'études de C. Cavallo.

vie, fragments suspendus. Pourtant le sens de ces lieux et de ces ruines - le point de vue adéquat à adopter - repose sur l'inscription de l'activité humaine sur le territoire, sur l'empreinte commune de l'habitat et du travail, souvent indissociables. «Le plaisir des yeux, la beauté des choses» écrit Braudel «dissimulent les trahisons de la géologie et du climat méditerranéens. Ils font trop facilement oublier que la Méditerranée n'a pas été un paradis gratuitement offert à la délectation des hommes. Il a fallu tout y construire, souvent avec plus de peine qu'ailleurs» (Braudel 1987, p.19).

Le projet dans les villages abandonnés : une méthodologie

C'est dans ces contextes d'abandon que le projet d'architecture peut trouver un rôle particulier, non seulement en tant que gardien de la mémoire mais aussi en tant qu'il dévoile et renoue, par l'insertion de formes contemporaines, la trame de relations construites au





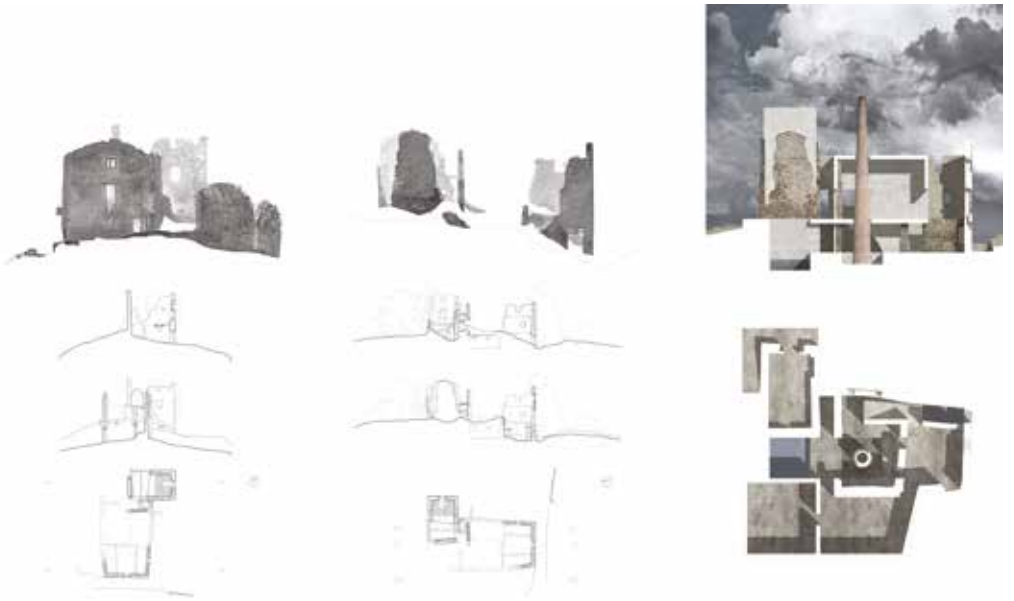


Fig. 5
Castelnuovo, un laboratoire pour le travail de l'argile entre les murs d'une maison-château antique. Relevé et projet. Mémoire de fin d'études de C. Cavallo.

Fig. 6
Castelnuovo, maquette à l'échelle 1:20, de gauche à droite: les maisons, le laboratoire de travail de l'argile, l'église et son parvis. Mémoire de fin d'études de C. Cavallo.

fil du temps, transmettant au futur les caractères de complexité et d'originalité sous-tendus dans la sédimentation d'une culture fondatrice antique.

Maria Grazia Eccheli a longuement approfondi la valeur du fragment et de la ruine comme mémoire architectonique opérante, capable d'évoquer des mesures et des principes fondateurs, en imaginant - presque unique condition du projet moderne- son processus constructif au sein d'une continuelle «interpolation entre fragments», expression des «possibilités qui restent, comme résonance ou virtualité, dans les relations syntaxiques» (Eccheli 2008, pp. 85 e 88) des pré-existences. Elle va jusqu'à considérer, comme limite extrême, que «le fragment, au sein du processus conceptuel, semble remplir un simple rôle de catalyseur: figé dans sa 'tâche' de témoin, il semble exiger une sorte d'intangibilité qui lui impose de participer à la nouvelle construction en tant qu'élément immuable. […] Il s'agit d'un processus d'origine antique et qui voit en l'église albertienne San Francesco di Rimini une sorte d'incunable» (Eccheli 2008, p.89).

Ces réflexions animent les recherches sur le thème des villages abandonnés menées par la professeure Eccheli dans le cadre des Ateliers de Projet et des mémoires de fin d'études à l'Ecole d'Architecture de Florence.

Les projets expérimentaux menés au sein du champ d'études propre à la composition architectonique, où la reconnaissance de la signification de la ruine éloigne

méthodologiquement à la fois le 'où et comment c'était avant' et la nouveauté à tout prix, s'inscrivant plutôt dans la définition de «restauration créative» - mais aussi critique - que Semerani confie à Collotti, pour le *Dizionario critico illustrato delle voci più utili all'architetto moderno* : «Bien que reconnaissant l'autorité de fondations antiques et d'alignements certains, il s'agit d'un acte de transformation non neutre et non d'une simple continuation qui serait déjà écrite dans un état de fait. Pour cela, l'attitude envers les constructions antiques ou anciennes importe dans le sens qu'elle réussit, avec une clarté suffisante, à poser les questions de leur transformation actuelle, de la restitution à l'usage à travers des formes et des types permettant la continuation de la vie à l'intérieur, […] la notion de restauration créative implique en ce sens aussi un mode particulier de trahir le texte auquel on se réfère, d'en transfigurer le contenu, tout en permettant de lire encore son message primitif» (Collotti 1993, pp.105-107).

Premier cas d'étude : Un projet pour Castelnuovo[2]

On arrive à Castelnuovo en une succession de collines argileuses et de ravins sur les bords de la vallée étroite et tortueuse creusée par le torrent Ventena. Bien que la campagne soit

[2] Il fascino discreto della rovina. Un progetto per Castelnuovo. Mémoire de fin d'études de Claudia Cavallo, dirigé par Maria Grazia Eccheli et co-dirigé par Giorgio Verdiani, soutenu le 17 settembre 2015 à la Faculté d'Architecture de l'Université de Florence.

Fig. 8 Castiglioncello, projet pour les nouvelles résidences sur les ruines le long de l'arête, maquette, groupe de travail: A. Ginese, B. Lolli, A. Messina.

Fig. 9 Castiglioncello, projet pour les résidences et les espaces collectifs sur les vestiges de la muraille antique, façade donnant sur la vallée, groupe de travail: F. Lucchesi, V. Raggi, S. Volpi.

désormais largement exploitée pour la culture extensive du blé ou en jachère, on y reconnaît les paysages de Raphaël, d'Urbino à San Marino, aux confins d'un Montefeltro dessiné par la main de l'homme, où chaque pic est couronné de signes iconiques - tours, forteresses et campaniles - qui forment d'amples triangulations de regards.

Les principaux centres, les petits villages et bourgs de la régions peuvent être lus comme une seule ville polycentrique, aux traits humanistes et anthropomorphes dictés par l'entente entre Federico da Montefeltro et son *Architectore* Francesco di Giorgio, où la 'tête' remplit «l'importante fonction de représenter le duc de Montefeltro aux yeux de ses sujets» (Adams 1993, p.129), dans un rapport proportionnel précis avec le 'corps'. La construction du paysage répond aux formes du terrain et aux exigences de représentation, déclinaison de cette *ratio* fondatrice qui trouve en la ville d'Urbino son expression la plus aboutie, décrite par Giancarlo De Carlo comme la «charnière magique» du territoire environnant, centrée sur le Palais Ducal (De Carlo, Watanabe 1987, trad.it. in Rossi 1988, p.19).

Parmi la végétation qui l'enveloppe et trompe les apparences, Castelnuovo est délinéé au sol par les fondations et les édifices en mauvais état. Entre les fragments intègres qui en émergent - le campanile, un segment de murailles, quelques maisons- un élément exceptionnel gouverne la structure urbaine, comme une 'acropole' naturelle, partiellement fortifiée et surmontée de quelques édifices seulement, au sommet de laquelle on

aperçoit l'Adriatique, tel l'infini léopardien, triangle bleu qui se découpe plusieurs fois entre les collines.

Le projet définit la vision d'ensemble du village à travers une possible réécriture par fragments, trois interventions envisagées comme cas exemplaires: les maisons (avec des annexes touristiques ou agricoles aux niveaux semi-enterrés), l'église avec son 'parvis' et le laboratoire de travail de l'argile.

L'articulation conceptuelle en éléments collectifs (services et lieux de rassemblement) et privés (pour l'habitat ou le travail) se configure dans son ensemble comme un plan dans lequel on indique une réglementation pour les tissus d'habitats de propriété privée, tandis qu'on en vient à une définition au niveau préliminaire pour les éléments publics.

Un tracé de matrice antique étend au nouveau la 'règle' empruntée aux habitats existants, une syntaxe faite d'escaliers et d'ombres qui scandent les hiérarchies spatiales, définissent les agrégations et rotations, mettent en lumière la mesure du lieu. À la limite entre architecture et topographie, les tissus d'habitats écrivent des rythmes modulés sur l'inclinaison, dont l'espacement exprime l'interpénétration entre la campagne et l'espace urbain, tandis que l'unité de mesure est définie par le développement des tronçons disponibles (4/4,5m); les maisons accueillent la terre à l'intérieur de leurs propres espaces, avec une progressive érosion dans le sens de la profondeur.

La cellule base en maçonnerie, flanquée d'un double mur contenant l'escalier, constitue le noyau de la maison rurale dans les Marches septentrionales et collinaires (Mori, 1946), dont l'évolution suit la croissance de la famille qui l'occupe. Dans les nouvelles maisons, les escaliers publics et privés s'articulent au sein d'un système complexe: entre deux murs se suivent l'escalier ouvert menant à la campagne depuis la rue principale et l'escalier fermé, plus élevé, qui dessert les étages privés de la maison.

Mais avant tout, on actualise la typologie d'habitat, en passant de la maison-refuge médiévale à la maison conviviale, de travail intellectuel, de repos et de contemplation du paysage.

La variété dans la règle de la construction médiévale, faite d'architectures - jamais tout à fait - spontanées[3], revient dans le projet des nouvelles maisons, déterminées par les nécessités spatiales des propriétaires, à l'intérieur d'un système de contraintes en termes de planimétrie et d'altimétrie, destiné à préserver la 'forme de la ville' (Fig. 3, 6).

La petite église aux pieds de la fortification présente une façade décharnée aux proportions presque classiques sous un tympan parfait, l'entrée consolidée révèle une enceinte découverte riche de moulures et de fragments de colonnes, et une unique fenêtre encadre le ciel.

[3] «non era ormai accertato che il mondo medievale, se faceva a meno di astratti piani regolatori, era vertebrato da saldi regolamenti edilizi?» (Zevi 1996, p. 29).

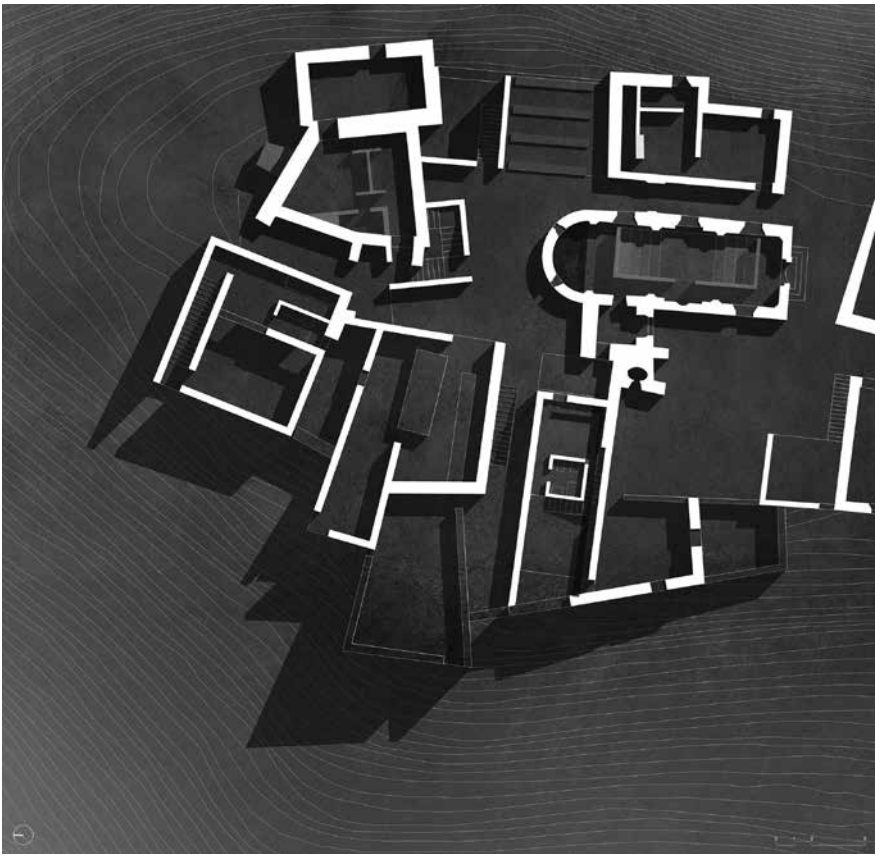


Fig. 10 Castiglioncello, projet pour les espaces collectifs et d'accueil dans l'enceinte du château antique, planimétrie, groupe de travail: A. Ghezzi, M. Lopez, G. Innocenti, C. Galassi.

À la place des formes désormais perdues de la spatialité du XVIIIème siècle, ornementée de stucs et de faux-plafonds de roseaux, on propose comme alternative une couverture simple, qui s'appuie sur les murs recomposés en hauteur et apporte de l'ombre aux trois travées, faisant office de prélude à l'abside ouverte - méridienne de lumière et de mémoire - où se poursuit le jeu silencieux du soleil sur l'eau.

En face de l'église, une maison de trois pièces cède l'espace central pour la composition de l'espace public et devient salle à ciel ouvert, espace à la fois intime et collectif, propre aux dimensions du village. Achevant la recomposition d'une place idéale, les espaces latéraux accueillent un bar et un restaurant, avec les espaces de services et la cuisine au niveau semi-enterré de la maison. Ici l'aspect domestique rencontre le mystère des fenêtres ouvertes sur le paysage, qui rappellent le jardin secret d'Urbino (Fig. 4, 6).

Au point le plus élevé du village, une ruine aux formes sculpturales domine le paysage et révèle le sommet du campanile à travers une fenêtre ouverte à l'étage noble. Cette étrange maison-château, à l'aspect rural et à la position dominante, a fait l'objet d'un relevé qui a permis de mettre en lumière les spatialités et d'en saisir les contours façonnés par le temps sur les murs[4].

Dans le projet, cet édifice est transformé en laboratoire pour le travail de l'argile, duquel émerge la cheminée en briques, symbole de re-fondation. Les espaces créés dans le sol sont recomposés en une tribune idéale, qui révèle la géométrie sous-tendue par les fragments et réunit les espaces de travail en contact direct avec les matériaux fondamentaux que sont la terre argileuse, l'eau et le feu. Cet étage de contrôle de l'horizon, mémoire des formes des cours et des citernes dessinées par Francesco di Giorgio pour Sassofeltrio, est un théâtre atemporel, où s'entrecroisent édifices nouveaux et anciens. Une pièce, assumant les dimensions du salon noble, est transportée sur la plateforme pour apporter une lumière nouvelles sur les espaces collectifs; dans le vide généré par ce déplacement sont insérés des escaliers et un petit patio méridional, à l'ombre de la façade qui encadre le campanile. À la limite septentrionale de l'estrade, certains fragments laissent deviner les proportions d'une tour qui, une fois recomposée dans sa hauteur, projette sa verticalité dans la citerne créée; à l'intérieur, un escalier monte et rejoint le paysage immergé dans la lumière étincelante de l'Adriatique (Fig. 5, 6).

Second cas d'étude : Castiglioncello, un village à inventer[5]

Perché sur l'arête étroite d'une colline, le vieux bourg de Castiglioncello, *castrum Castiglioni*, domine «une gorge à l'aspect particulièrement alpin, où s'écoule, rapide, le torrent [Santerno], dans un lit sinueux, encaissé et au fond rocheux. Les versants sont très accidentés, ici boisés, là rocheux, cultivés uniquement en partie basse et dans une moindre mesure» (Giannitrapani 1881, p. 45). Sur la pointe extrême, creusée par le torrent Vincareto, un affluent du Santerno, les restes d'une forteresse médiévale, dotée de tours crénelées et d'une voie d'accès, témoignent du rôle originel de l'implantation chargée de contrôler le col apennin vers la campagne d'Imola (Fig. 7).

Terre aux confins entre la Toscane et la Romagne, le village s'est construit au fil des siècles en conservant la physionomie du château antique, encore visible dans les habitats accolés les uns contre les autres, «manifestement construits à partir de réemplois médiévaux» (Casini 1914, p. 126).

[4] Relevé effectué avec la technique du scanner tridimensionnel le 21 mars 2015 par le Prof. Giorgio Verdiani, avec Stéphane Giraudeau.

[5] Projets élaborés par le Laboratorio di Progettazione dell'Architettura IV, enseignante : Maria Grazia Eccheli (modulo Urbanistica M. Rossi), assistants : A. Baxhaku, C. Cavallo, C. Lisini, E. Pazzaglia, 2016-17 et 2017-18.

Le paysage est d'une beauté décharnée, falaises et bois escarpés, avec de rares échappées évocatrices sur les champs cultivés, comme un lieu sévère qui semble alimenter mythes et dévotions religieuses transmis par la tradition orale. Ce n'est pas un hasard si deux édifices sacrés ont scandé le développement de l'habitat : à une extrémité, l'église paroissiale (seconde moitié du XVIIIe siècle) construite dans la forteresse, agrandissant et renversant ainsi «a proporzione del Populo» (Tagliaferri 2017, p. 118) l'implantation de la chapelle pré-existante du château, en entérine la transformation en village rural; à l'autre extrémité, l'oratoire della Madonna del Poggio (1796) marque la limite de l'expansion des maisons éparses le long de l'arête.

Les projets, dans l'hypothèse d'amplifier la capacité d'accueil du village d'environ 100 habitants, visent à interpréter et valoriser les caractéristiques spécifiques du lieu et des architectures, d'un côté denses et compactes, de l'autre raréfiées et éparses sur l'arête rocheuse. «Les lieux ont un esprit, une mémoire» déclare Wim Wenders «ils se souviennent de tout, comme si c'était gravé dans la pierre, plus profondément que dans l'océan le plus profond. Leurs souvenirs sont comme des dunes errantes transportées au gré du vent. Peut-être est-ce la raison pour laquelle je photographie surtout les lieux: pas simplement pour en donner une image banale mais pour invoquer leur capacité à rappeler […]» (Wenders 2010, citato in Teti 2017, p. 23).

Fig. 8. Castiglioncello, projet pour les nouvelles résidences sur les ruines le long de l'arête, maquette, groupe de travail: A. Ginese, B. Lolli, A. Messina

Sur la base de recherches à l'échelle territoriale et en se mesurant avec la définition d'un plan directeur, les groupes de travail des élèves sont invités à proposer des transformations et des ajouts capables d'affronter à la fois les exigences de la conservation, dans ses aspects techniques et matériels, et avant tout le thème compositionnel de la reconstitution d'une nouvelle 'figure' du village, aujourd'hui disséminée parmi les ruines survivantes.

Ainsi au sein des projets l'oratoire est préservé poétiquement dans sa figure d'avant-poste solitaire au sommet, lieu de méditation sacrée ou laïque, ou encore dans d'autres cas, transformé grâce à de petits artifices, comme pour une scénographie éphémère, en dispositif pour la contemplation du paysage, point de rencontre entre terre et ciel.

Les ruines isolées, presque toujours composées d'un unique espace sur deux niveaux, sont interprétées comme de potentiels lieux d'accueil pour de nouvelles résidences, permanentes ou temporaires, à rendre fonctionnels en les dotant de services modernes. Sujets à des ajouts ou des intégrations projetés sur les nivellements irréguliers, dans les nouvelles configurations ces lieux semblent suivre une trame de directions variées suggérées par le site, en maintenant intact l'accord intime et la fusion avec le paysage de la colline. Ici les

projets déploient une grammaire dictée par le sol où les signes de ponctuation sont constitués par les creux de l'orographie, les vides parmi la végétation, les restes de murailles antiques, parfois soulignées par des escaliers métaphysiques découpés sur le sol (Fig. 8).
Sur les sédiments des constructions stratifiées au fil du temps le long du périmètre de l'ancienne fortification, où sont prévues les lieux de réception touristiques et les espaces publics - espaces pour des laboratoires d'artistes ou d'artisans, points de restauration, petites bibliothèques thématiques, salles en gradins - la logique des projets se fait plus explicite : les nouveaux ajouts reproduisent la mesure des édifices préexistants en se courbant en rotations qui signalent les espaces collectifs ou de travail, ou encore en s'ouvrant au sommet sur le spectacle de la nature environnante (Fig. 9). Au cœur du château antique, recomposé dans sa nature compacte, la règle sous-tendue aux nouvelles constructions met en résonance le passé et le présent, déduisant de l'ancien les traces et les mesures, mais s'écartant souvent des murs d'origine en pierre, en insinuant des ouvertures sur le paysage, telle les ruelles antiques, ou en laissant de grands vides sur toute la hauteur où l'on peut lire les signes du passage du temps. C'est le cas de l'espace dégagé suite aux effondrements sur le côté de l'abside de l'église, transformé en petite place, parfois ouverte mais protégée comme les anciens espaces de travail agricole et qui permet d'apercevoir depuis la vallée la physionomie de l'édifice sacré. Près de la porte d'accès au village, la silhouette d'un nouveau volume destiné aux jonctions verticales complète la forteresse originelle et devient 'dispositif scénique', qui empêche la vue vers l'intérieur et doit être traversé pour accéder au centre du village, mémoire de la complexité des habitats médiévaux (Fig. 10).
Dans leur ensemble, les opérations de composition définissent le nouveau paysage construit et en même temps révèlent l'essence profonde de l'implantation aujourd'hui abandonnée, évoquant l'identité du petit bourg médiéval, similaire à San Gimignano vu à travers les yeux de Benjamin, un village silencieux qui «semble glisser soudainement vers la campagne, par la porte» (Benjamin 1971, p. 65).

Quel rôle pour le projet ?

Affronter le thème des paysages abandonnés signifie se confronter avec des stratégies de développement complexes où l'architecture contemporaine peut être à la fois vecteur et manifestation de transformations capables d'accorder les marques de l'histoire avec ceux du présent. «Le but est toujours de maintenir l'accord entre les composantes formelles et fonctionnelles, mais l'ordre des facteurs est inversé par rapport à ce qui advient dans les constructions nouvelles; dans celles-ci, il existe une réalité économique et sociale de départ et il s'agit de lui donner une forme physique adéquate; pour les espaces antiques la forme physique

existe et il s'agit de lui procurer un fondement économique et sociale compatible avec ses valeurs formelles» (Benevolo 1968, p. 145).

Les villages sont considérés dans le projet comme de véritables systèmes urbains, de petites dimensions mais organiquement complexes, au sein desquels faire interagir une grande variété de fonctions, composées d'un point de vue architectonique selon des proportions précises entre espaces publics et privés et selon des relations rigoureuses entre les parties, qui ensemble «témoignent et narrent le rapport entre individu et collectivité» (Zevi 1996, p. 55). L'intention est de concevoir la cohabitation entre des sujets divers : nouveaux habitants et citadins 'de retour', entreprises agricoles et artisanales, acteurs extérieurs avec des ressources et des projets culturels, mis côte à côte avec des lieux imaginés pour la retraite et le repos, des espaces de convivialité et d'accueil, laboratoires d'art, salles collectives, petits théâtres à l'air libre.

Mais avant tout, dans de tels contextes de ruines et de fragments, il s'agit d'interpréter la susceptibilité continue des vestiges du passé, dont les usages et les significations changent selon l'évolution des circonstances, d'en révéler le flux de combinaisons et de variations «soumises à une logique interne qui les organise» (Focillon 1945, p.67), d'en expliquer poétiquement la morphologie génétique, dans un équilibre continu entre la mémoire et la vie.

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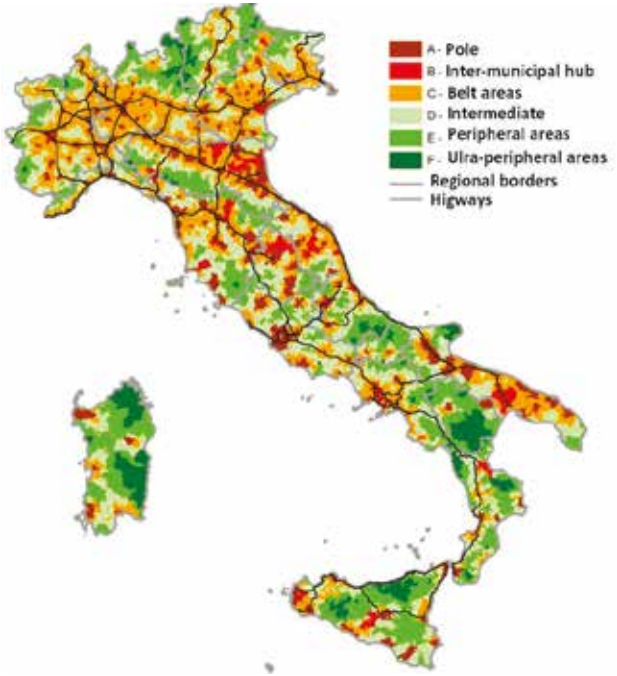
A- Pole
B- Inter-municipal hub
C- Belt areas
D- Intermediate
E- Peripheral areas
F- Ulra-peripheral areas
Regional borders
Higways

MOUNTAINOUS ABANDONED AREAS. TERRITORIAL FRAGILITIES, REUSE, REBIRTH

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Italian inland areas (SNAI) and physical map (Eric Gaba, Wikimedia). The high concentration of mountains is evident.

Fragility is the condition of being easily damaged, with poor resistance to trauma, stresses, and negative situations. This concept, if attributed to a territory, can refer to the weak ability to respond to natural catastrophic events and social or economic changes.
Mountainous territories feature hydrogeologic fragilities related to periodic upheavals in anthropized areas and are connoted mainly by institutional and economic fragilities, which have increased in Italy since the anthropologic caesura of the post-Second World War period. Since the '70s, the desire for recovery and recolonization of rural areas has begun to grow. However, real recolonization has never happened in the mountains.
Re-inhabiting needs to ensure economic sustainability, understood as self-subsistence, and environmental sustainability for the preservation of the landscape and local biodiversity. The circular economy is considered a strategy, given that it does not contemplate the concept of waste: all that is discarded from one biological system becomes a raw material for another.
This paper presents an ongoing study that is part of two research grants[1] aimed at investigating methods and strategies for regenerating abandoned mountainous areas starting from the reflections on the socio-economic and environmental processes that underlie their fragilities.

Keywords: territorial fragilities, mountain, abandonment, regeneration, mountain agriculture.

Inland areas: fragilities and resources

"Fragility" is increasingly used to indicate a condition of low resistance and instability, and today it represents uncertainties related to different issues (e.g. political and economic instability, energy and ecological transformation, demographic issues) (Chiffi, Curci 2019). Commonly, fragility means a status of being fragile, or rather the condition of being easily damaged, broken, or harmed, with poor resistance to trauma, stresses, and negative situations[2]. If related to a territory, the concept of fragility refers to the weak capacity to respond to natural catastrophic events (e.g. hydrogeologic instabilities, earthquakes), the lack of resistance to social or economic transformations, and the inability to be resilient to lifestyle changes.

[1] The research belongs to the "Territorial Fragility" project of DAStU, Polytechnic of Milan, Excellence Department by the Italian Ministry of University and Research (2018-2022).
2Cf. "Fragilità" in the Italian Treccani dictionary (www.treccani.it/).

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Covid-19 has introduced changes: smart working in Apennines (credits: V. Cinieri), and chalets converted to offices, Entrèves, Courmayeur (credits: Auberge de la Maison).

Italian inland areas (SNAI) and physical map (Eric Gaba, Wikimedia). The high concentration of mountains is evident.

De facto, the fragile territories are inland, mountainous, or hilly areas whose marginal conditions are often aggravated by hydrogeological or seismic risk. In the last decades, dominant economic strategies have concentrated on investments and resources in strong territories. Various large infrastructures (fiber optic backbones, high-speed trains, airport development) were constructed and significant events were in major metropolises[3]. Some fragile territories were subject to territorial cohesion policies or lowered public assistance and were not able to stop the decline. Local administrations have consented to weak negotiations linked to the scarcity of financial means, and in some cases innovation has been discouraged by phenomena of local communitarianism, closed to any external contribution. The result was the *exit* of the most dynamic populations, who had the opportunity to migrate, or the *voice* through a protest vote for populist parties by people trapped in their forgotten territory (Balducci 2019).

The Italian fragile territories are a large part of their inland areas. The SNAI[4] defines them as territories that are significantly distant from supply centers for essential services (education, health, and mobility), even if these areas feature important environmental and cultural resources, which are highly diversified by nature due to centuries-old anthropization. The inland areas are evaluated with an accessibility indicator in terms

[3] A large number of secondary railway lines have been suppressed in the weak Italian areas, enormous capital was invested in high speed, and several hospitals and schools have been closed for a rationalization logic without considering the needs of the different territories (Balducci, 2019).

[4] The Italian National Strategy for Inland Areas is defined by the Partnership Agreement with Italy 2014-2020; the document approved by the European Commission defines strategies, methods and priorities for spending the resources co-financed by the European Structural and Investment Funds for the 2014-2020 programme.

of minutes of travel to the nearest pole. These areas make up 60% of the Italian territory and are divided into intermediate, peripheral, and ultra-peripheral areas. They represent approximately 53% of the Italian municipalities, in which 23% of the Italian population lives (over 13.5 million abs.) according to the latest census (SNAI 2013).

A significant part of the inland areas has gradually undergone a process of marginalization since the Second World War following population decline and a reduction of employment and land use; decreasing local supply of public and private services; social costs for the entire nation, such as hydro-geological instability and the degradation of the cultural and landscape heritage. Negative effects were also the result of policies – as mentioned above – of public or private interventions (quarries, landfills, inadequate forest management) aimed at extracting resources from these areas without generating innovation or local benefits (SNAI 2013). This situation has caused an unbalanced country, neglecting the largest part of the territory, and polarizing the economic development on the large urban centers, the few plains, and some coastal stretches (Balducci 2019, Pazzagli 2020). But, as Rossano Pazzagli (2020) says: «there is an essential network from which you can start again: that of the towns, hamlets, and districts that populate Italy from north to south, even in the narrowest valleys and on the most inaccessible ridges».

Covid-19 has introduced changes: smart working in Apennines (credits: V. Cinieri), and chalets converted to offices, Entrèves, Courmayeur (credits: Auberge de la Maison).

The interest in Italian fragile areas began in the 1980s, mainly with the anthropological studies by Vito Teti. Several recent investigations have brought up the issue of fragile Italian areas[5]. Moreover, the academic interest in marginal territories has grown widely during the recent pandemics, and overall with current Covid-19 (Cf. Fenu 2020).

Material evidence and biodiversity, which have been preserved in these territories, constitute their wealth and are essential for regeneration strategies: «what is left in the Italian inland areas full of villages? […] Not the nothing, but the emptiness; not only the vulnerability of a fragile territory; not only desolation and isolation but also a set of resources that the central areas do not have and cannot dispose of; perhaps even the seeds of a territorial and moral rebirth of the country remain there, more or less hidden» (Pazzagli 2017).

The key elements are two. The opinion that social inequalities, rather than economic ones, constitute a brake on development and an incentive to abandon territories, and the concept

[5] Cf. Recycle Italy (2012-2016), Fabian, Munarin 2017; "Arcipelago Italia" in the Italian Pavilion of the Architectural Biennale (Cucinella 2018).

Resilient farms, Val d'Aveto, Ligurian Apennines (credits: V. Cinieri).

of territory, no longer a conceptual space to which pre-established growth models can be applied, but territory as a set of important territorial capitals (natural and infrastructural, productive, human, social) with strong development potential. As Maria Annunziata Oteri writes (2019), this theory had already been that of many economists between the 19th and 20th centuries (e.g. Cattaneo, Einaudi, Fuà, Bertolino, Becattini) and is based on the concept of territory as a set of places characterized by history, traditions, or rather a common heritage.

Inland territories retain strong development potentials based on the practice of "common acting" and the non-competitive management of local resources. So, community production is a possible process of recolonization territories that are ideal places for regional innovation alternatives to the predominant strategies of capitalist development. However, thinking that the reactivation of these places derives only from one's "vocation" is to be excluded (Oteri 2019), which is the idea of the escape from modernity and a nostalgic return to a pre-industrial past, when communities were mostly self-sufficient and strongly rooted in their territory. This is an attitude that has already been understood by society since the end of the 1960s, but which has not led to effective conservation of traditions, or a real repopulation, although it has sometimes led to the recolonization of some places in marginal areas in recent times (Cinieri, Zamperini 2013).

In recent years, introducing economic reactivation strategies to accompany the

architectural recovery of abandoned villages has been spreading, not necessarily keeping only traditional activities, sometimes no longer sustainable, but identifying the characteristics that persist despite the changes, and on which communities can set up a development strategy (Oteri 2019)[6].

The proposed conception envisages a mentality change: the inland areas are no longer intended only as a landscape in its aesthetic value, but rather areas-landscape as sedimentation of historical-economic and historical-cultural processes[7]. The landscape is a container of values (aesthetic, environmental, social, economic, historical-cultural) and their «space for integration» (Tosco 2009). The transformation and protection policies are based on these values and their relationships, starting from history.

A place-based approach meets preservation needs. It is well established that built heritage conservation should not be embalming (cf. Dezzi Bardeschi 1991) and does not imply a passive adaptation to changes, but a restoration/reuse from a co-evolutionary perspective (Oteri 2019).

Mountains: sunset and rebirth

Mountains feature hydrogeologic fragilities related to periodic upheavals in anthropized areas, and so the living spaces. The highlands are connoted mainly by social, economic, and institutional fragilities, which have increased in Italy since the «anthropologic caesura» of the post-Second World War period.

On the other hand, in mountains, historical and traditional features (architectural techniques, craftsmanship, agriculture) are better preserved, in connection with the

[6] In this background, an illustrative recent case is the experiments to establish the cultivation of quinoa in the high Oltrepò Pavese (Pavia) as a culture considered sustainable, so suitable for reactivating a high hill area that is an internal marginal territory (Tabaglio et al. 2015).

[7] This purovisibilist idea was the basis of the old protection policies (Italian Law n. 1497/1939), but it has evolved with more recent strategies and regulations (Legislative Decree 42/2004) that consider landscape in all of its meanings as cultural heritage.

marginalization. According to the principle of least effort, since prehistoric times, progressive sedentary lifestyles have led to the adaption of architecture to the morphology of places, employing local raw materials, used according to an in-depth empirical knowledge of their features and with manufacturing mastery. The local feature is also due to the need for indoor environments for life in specific climatic conditions (extreme winter cold, seasonality of streams, snowfalls, etc.) and ways of living associated with cultural or economic factors (concentration or diffusion of settlements, permanent settlement linked to activities such as agriculture, or periodic transhumance) (Cinieri, Zamperini 2013).

The 20th-century changes and economic policies led to the abandonment. In the highlands, outside areas linked to major sports tourism, there has never been a real repopulation. As long as the mountain has been a territorial system, it has never been an area in need of attention. Its internal organization created a unique and unitary model of life, so much so that it almost always went beyond the same political boundaries. The transformations induced by tourism on accessibility, economy, landscapes, and life models, have modified the pre-existing territorial system and fragmented the mountain into subsystems. Sometimes, these transformations have strengthened the links between mountains and plains and between peripheral centers and cities in the valley floor; in some cases, the changes have made them looser, if not canceling them in others (Salgaro 2017)[8].

Today, we are witnessing an important paradigm shift. As Vito Teti (2018) said, the abandonment of mountains is also often related to external or internal perceptions of places. The idea of the mountain as a place of natural poverty, isolation, backwardness, and anguish is the result of a partial and prejudicial view or is the consequence of recent abandonment and decay. Salgaro (2017) underlines the importance of the a priori negative assessment of the morphology, where verticality would be a disadvantage. The problems of the natural risks of many areas (e.g. hydrogeological instability) are not denied, but the first response to the crisis must be cultural (social sustainability).

A first step could be the awareness that mountains and hills have historically been the seat of the most important agricultural resources (olive, fruit trees, vegetables, vines, livestock), and also, in ancient times they were fertile cultural centers[9] (Teti 2018). Recolonization requires a renewed sense of identity of the place that goes beyond the sense of belonging by birth but is based on the creation of a new identity (Salsa 2009).

[8] These are topics of Europa 2000+ and Interreg Alpine Space.
[9] Think of the important late-ancient and medieval monasteries (e.g. San Colombano in Bobbio, Gioacchino Fiore in Calabria).

Resilient farms, Val d'Aveto, Ligurian Apennines (credits: V. Cinieri).

The current interest is related to the common idea that mountain life and food are of high quality. The food produced in the mountains is of quality because it is not easy to establish intensive agricultural activities in these areas, and the few resilient farmers have continued the tradition with relatively few changes. In the mountains, the air quality is better, and the perception of well-being is greater. The increase in the importance of researches and projects – both academic and not academic – and strategic planning that considers mountain agriculture in connection with architectural recovery and recolonization, demonstrates what has been said[10].

Conclusion: re-thinking of mountains

The ongoing study proposes a multiscalar approach: territory (scale 1), building system (scale 2), architectural element (scale 3). Sustainability is crucial to a rebirth of the mountains and the reactivation should consider these topics:

- environmental impact reduction,
- preserving biodiversity (natural and agricultural),
- reactivating economy,
- providing connections,
- conserving cultural identities.

Life Cycle Assessment permitted a change of perspective. LCA aimed at an *ex-ante* quantitative evaluation of the environmental impact on a global level, instead of an *ex-post* damage correction. Since the Earth has limited resources, the environmental issue proved that «from cradle to grave» processes are not sustainable anymore. On the contrary, any product should be reused for new production processes, after its disposal. The mantra "From cradle to cradle" of the circular economy is an approach that goes beyond the waste concept: what is junk for one biological system is a raw material for another. The strategies on fragile territories consider this principle: the discarded areas, as such, must become the cornerstones for imagining new development models (Decandia, Lutzoni 2016). These issues are solutions to curb the constant phenomenon of land consumption and waste of resources[11].

To reactivate the economy, the first production sector to consider is agriculture, because it is the main productive activity in mountains. It is necessary to consider both traditional and

[10] Cf. AttivAree (attivaree.fondazionecariplo.it/); Progetto Ager (agricolturadimontagna.progettoager.it/); Ge.S.Di. Mont instute; Italian-Swiss Interreg (progetti.interreg-italiasvizzera.eu); Alpe-"L'Italia sopra i 600 metri"; EusAlp (www.alpine-region.eu/).

[11] In Italy, land consumption has grown with an average of 7 m^2/sec for over 50 years, in contrast to the decrease in population (ISPRA 2019).

innovative cultivations and activities from a sustainable perspective (e.g. AttivAree, UniMont researches, Gretter et al. 2019).

Tourism is another important sector. Sports tourism is often linked to skiing, but this activity is in decline. One reason is the elitist character of the sport, but climate change and cultural transformations are other causes. Furthermore, tourism of the past usually considered the mountain as an appendage of the city (cf. Pedrazzini 2019). Tourism must transform itself into a responsible and social activity, capable of stimulating other economic sectors by promoting culture and the environment for sustainable and innovative entrepreneurial development (cf. Salvatore, Chiodo 2017). The trend is slow tourism, which promotes innovative travel experiences, from historical trains to cultural itineraries, paths, cycle paths, horseback riding, from a "green" and cultural point of view.

The issue of connections is crucial and current. The first important connection is the virtual link (fast internet networks), which allows smart working, and some local administrations are increasing the fast internet network.

At the end of this review, one wonders what the role of architecture is. Architecture should restore existing artifacts, orienting projects to respect historical and identity features. Architectural design is necessary for reuse, which implies regulatory adjustment (structures, systems, etc.). In the long debate on restoration from the post-war period to today, it is now recognized that without reuse and agreement between functional and conservation needs, the conservation of architectural cultural heritage is not possible. Furthermore, without multiscalar and multidisciplinary planning, which envisages activities for economic, social, and environmental sustainability of the place, restoration and reuse would be an end in themselves.

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THE PERMANENCE OF FORM. A METHODOLOGICAL PROPOSAL FOR THE RE-SIGNIFICATION OF DEPOPULATED SMALL TOWNS OF SARDINIA

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The ruins of Pranu Sartu village, hidden by the vegetation.

The process of abandonment of Sardinian villages is a topic of great interest nowadays, not only in various research fields but also in political debate and public opinion. The evolution of the Sardinian settlement system has been studied since the 1960s; but only recently these studies are turning, in a multidisciplinary way, towards the analysis of the current phenomenon, to understand the contemporary role of these villages, which are at the same time a fundamental component of landscape and cultural heritage.
Within wider research carried out by the Department of civil engineering and architecture and the Department of political and social sciences of the University of Cagliari on the topic of depopulated villages, this work aims at exploring the issue of values in architecture as an interpretative method aimed to support programs and plans of reuse or re-signification actions for small towns in Sardinia. The recognition of their historical, architectural and landscape qualities, supported by the analysis of social and psychological values, allows defining the cultural significance of the individual nodes of the villages settlement network, paying also particular attention to their current or potential importance for the communities that live and use them, in a stable, temporary or marginal way.
Values are determined through, on the one hand, an in situ survey, in order to understand historical and architectural values and, on the other, a socio-psychological survey. Thus, these are related through matrices, to translate the deep meanings of the system of the small towns into a holistic, composite and univocal representation, also to define strategies for their enhancement.

Keywords: abandonment, interpretation, values, communities, reuse.

Introduction. The wider research - CG

The national and international political debate has paid, for several years now, increasing attention to the issue of depopulation and abandonment of small towns, in consideration of its social, economic and cultural consequences. In Sardinia, the current scenario prefigures a gradual erosion of the historical settlement heritage which, due to a kind of 'domino effect', seems to rapidly amplify, with the consequent abandonment of ever-wider areas (Fig.1).
Interventions for resisting and contrasting the socio-demographic impoverishment currently underway can only be triggered by a conscious reflection on the geographically visible effects of the population decline that is affecting the local physical landscape, less and less occupied

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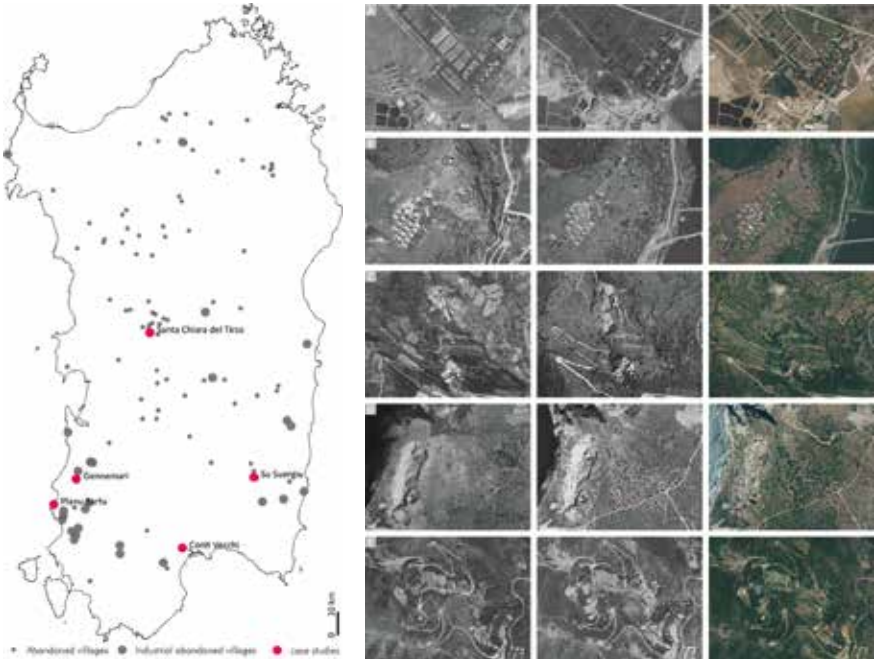

Fig. 1
The system of the abandoned and depopulated villages of Sardinia.

Fig. 2
The aerial photos of the five case studies. The picture shows, horizontally from left to right, the 1968, 2003 and 2013.

in residential terms. The centrality of the topic in the current context has also led the world of research and universities to invest their resources in the study of this phenomenon, in an attempt to contribute to the definition of actions that can stop, slow down or reverse the dynamics in progress. These efforts are aimed at exploring both the ongoing phenomenon[1] and the processes that have already taken place. In both cases, the aim is to deepen the study of the risks and opportunities for the protection and enhancement of the historical settlement heritage.

This contribution illustrates the results of the experimentation conducted by an interdisciplinary research group composed of experts from the chairs of Historic Conservation, Architectural and Urban Design and Sociology of the University of Cagliari. The goal is providing an interpretation of the phenomenon of depopulation, which could be fully aware of the complexities and values at stake and be achievable only through a multilayer gaze, i.e. capable of combining multiple perspectives. The experimentation proposed here makes use of methodologies which, starting from the 'theory of values' introduced

[1] In Sardinia, data reveal a dramatic demographic situation: of the 377 existing municipalities, 83.3% have less than 5000 inhabitants (Cocco, Fenu, Lecis Cocco-Ortu 2016, pp. 16-23). 31 of these municipalities are considered at risk of disappearing within the next sixty years (Puggioni 2016, Pp. 26- 29).

by Alois Riegl (Riegl 1903), have spread since the end of the 20th century (Fredheim 2016), and which in the specific case are applied to the study of five Sardinian villages – Su Suergiu, Santa Chiara del Tirso, Conti Vecchi, Gennamari, Pranu Sartu – currently completely deprived of their residential use (Fig. 1). Through the use of an interpretative tool inspired by value-based approaches and applied to the cases just mentioned, we intend to reflect on the potentialities and limitations of these methods in application to the protection and enhancement of historical contexts, highlighting the results obtainable in decision-making and design.

Value-based approaches. A methodological proposal - EC, AP

As just mentioned, Rieglian theories on the value of monuments and the recognition of the role of values in the definition of the cultural significance of heritage (ICOMOS 1999) have recently encouraged the scientific community to experimenting applications aimed at linking places to their meanings, in order to facilitate the definition of conscious operative choices.
The value-based approaches, developed since the end of the 20th century, represent methodological procedures aimed at recognizing, protecting and enhancing the cultural importance of heritage, understood as the overall value of heritage, or as the sum of the values that constitute it (Friedheim 2016, p. 466).
Due to their transdisciplinary nature, values represent a key to interpreting cultural heritage capable of relating characters of a different nature and integrating them into a composite and, at the same time, unique framework (Pinna 2019). Their reading and interpretation allow, for example, to define the "priorities"[2] for action in cultural systems characterized by heterogeneous elements, such as the case of abandoned villages. Data and information deriving from the application of this methodological approach on cultural heritage favour the building a transdisciplinary and cross-scale cognitive overview. In fact, value-based approaches make possible to involve branches of knowledge that deal with protection and enhancement of heritage and which are more or less similar to each other (e.g., historic conservation, archaeology and history of art, as well as urban planning, marketing and management); and it is possible to analyse different types of assets, such as archaeological finds, artworks (Ashley-Smith 1999; Appelbaum 2007), historical architectures (Orbasli 2008; Stubbs 2009) or landscapes (Stephenson 2008; van Zanthen et al. 2016).

[2] The action of choosing a specific cultural asset, in order to protect or readapt it, within a broad spectrum of other cultural objects constituting the heritage – i.e. a cultural system –, reflects the manifestation of a priority. This priority can be expressed according to a monodisciplinary or subjective vision however. The interaction between different disciplines can help to smooth over imbalances due to sector-based points of view.

Fig. 3
A view of Su Suergiu site: on the right side, the restored village, on the left the mine buildings.

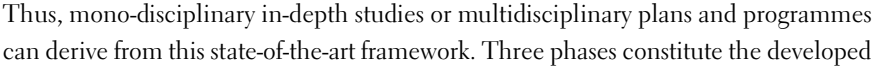

Fig. 4
Santa Chiara del Tirso, a glimpse of one of the street.

Thus, mono-disciplinary in-depth studies or multidisciplinary plans and programmes can derive from this state-of-the-art framework. Three phases constitute the developed and proposed methodological protocol: 1) knowledge; 2) interpretation; 3) project. This contribution focuses mainly on the second, based on the analysis of values.

The knowledge phase has been divided into two distinct moments: the first is based on the application of conventional methods, with the study of indirect sources (bibliography, cartography, iconography, filmography and archival documents) and with the direct analysis of places (through on-site inspections and the production of photographic documentation and surveys); the second, is aimed at collecting data relating to the intangible aspects of the investigated contexts, through the use of survey tools in the form of a structured interview with local communities.

The passage from the knowledge phase to the interpretation phase is established through the definition of the value categories associated with cultural heritage, completed by the identification of attributes and numerical indicators[3]. With specific reference to the case

[3] The 'values' express the meaning assigned to the cultural object by the investigator; the 'attributes', tangible or intangible, represent the elements or characteristics that express the cultural value; the 'indicators' describe the attributes, and must be, as far as possible, measurable (Waldemar 2015).
Specifically, here 'values' have been divided into three classes: 1. tangible value, 2. intangible value, 3. use value. Specific attributes are associated with each of them: 1.a. architectural quality, 1.b. historical significance, 1.c. state of conservation; 2.a. knowledge, 2.b. perception, 2.c. representation; 3.a. economic potential, 3.b. localization, 3.c. accessibility (Pinna 2019).

in question, the interpretative matrix converts the data relating to tangible and intangible values – the first deriving from the assessments provided by experts, the second from the answers provided to the structured interviews – which are encoded through numerical indicators in place of textual information. In operational terms, the matrix shows, for each village, the numerical indicators relating to the individual attributes[4]. The matrix, synthesizing the heterogeneous results deriving from the knowledge phase, favours an immediate comparison between them and, therefore, a systematic interpretation of the same.

The overall importance of the tangible and intangible values is obtained as the arithmetic mean of the individual attributes. They can be compared individually, but at the same time, their sum can provide information on the 'cultural value' in general terms.

In this way, the meaning of these results is twofold: on the one hand, they provide a 'static' representation of the villages, referring to the current moment; on the other hand, if we consider the value system in continuous transformation, these numerical indicators can be interpreted in a projective way, that is, they can offer indications on how to direct an enhancement

[4]The knowledge framework of cultural assets can also be previous, i.e. it is possible to convert studies of different types, that have already taken place, into numerical indicators. However, for an optimal result, it is desirable to coordinate analyses and surveys in order to have a more adequate interpretation.

Fig. 5
Conti Vecchi village. The officials' houses.

process. In other words, the interpretative framework of values thus outlined can be used to initiate the third and final phase of experimentation.
It is therefore evident that in the second phase the univocal and composite gaze, which was previously mentioned, is realized, and is able to combine the point of view of the different disciplines involved. The research group belief is that valid and effective intervention strategies could be made possible only by a broad and conscious vision.

The case study - VP

To specifically illustrate the followed procedure and the results obtained by applying the survey method illustrated above, a brief overview is provided below to outline the framework of settlements that currently characterizes Sardinia.
Here, the phenomenon of depopulation is resulting in the accentuation of the demographic gap between coastal territories and inland areas, with a subversion of the historical trends that constituted the historical territorial structure. Currently, indeed, there is an important population density in the major urban centres located near the coasts, this historically considered unsafe for the menaces coming from the sea; at the same time, the innermost areas are undergoing a dramatic 'emptying', which mainly concerns smaller towns located in contexts with a lack of infrastructures (Bachis et al. 2020; Fiorino et al. 2020).
The villages in question make up a patchwork of depopulation that is extremely variable and diversified in terms of size, typology, chronology, also modalities of triggering the

phenomena of abandonment, as well concerning the evolutions in progress. All this refers to the geomorphological heterogeneity of the region, to the historical-political complexity, to the peculiarities of the local culture and the religious traditions, but also to the economic and social dynamics and, also, to the constructive and technological knowledge. Among the abandoned places, a large part is represented by the industrial villages, whose establishment is the consequence of the start of production and exploitation of natural resources (mines, quarries, salt pans, industrial centres, hydroelectric power stations, etc.). They arose, with greater intensity in the 19th century, to accommodate managers, executive, officials and workers of the various production sites. Their closure resulted in total decommissioning of plants and the gradual abandonment of villages. Most of these are located in exceptional environmental contexts, and the absence of people and the cessation of activities – which have often altered and deeply contaminated those places – have led the 'natural' component to reown the spaces that had been taken from them. Thus, nowadays, these are suggestive places, capable of attracting the attention of visitors and enthusiasts; this condition could more easily induce the local public administrators, or private individuals, to foresee their transformation for tourist use. Obviously, these choices would have a decisive impact on the material conservation of the villages, on the one hand stopping the process of decay, but on the other hand implicating profound changes, both on the urban and architectural scale, which certainly should be carried out in a managed and aware way.

The five cases selected for testing the proposed methodological protocol are part of the category of industrial villages, built between the end of the 19th and the first half of the 20th century: Su Suergiu (Villasalto)[5], Santa Chiara del Tirso (Ula Tirso)[6], Conti Vecchi (Cagliari)[7], Gennamari (Arbus)[8] and Pranu Sartu (Buggerru)[9]. These are characterised according to the specific function of the production site to which they are connected, to the geographical location which affects the architectural peculiarities of the buildings in terms of typologies, techniques and construction materials, as well as to the degree of decay (Fig. 2-7).

As revealed in advance, the tangible and intangible values of these centres have been analysed.

[5] It was founded at the end of the 19th century, in the service of the mining site of the same name (1880-1987), and it has recently been restored and adapted in a museum.
[6] Built starting from the 1920s in order to realise the Omodeo dam (1917-1924) and to oversee the hydroeletric power station decommissioned in 1997, it reached its maximum expansion and the current urban form in the 1950s.
[7] The village was contextually built with the saltworks of the same name at the beginning of the 20th century, nowadays only the owner and managers' houses and the community services centre services remain.
[8] It grows for addition of buildings starting from the 1855, when the mine of the same name were given the concession.
[9] It arose in the 1860s, near to the sites of extraction of lead and zinc, and got definitely abandoned in the 1940s.

Fig. 6
Gennamari village. On the left the ruins of the church and the shop.

The first of them was obtained through a direct study of the five case studies, chosen so that they made up a representative picture of the heterogeneity of the industrial villages existing in Sardinia. On the basis knowledge phase results, it was possible to define the material value of each village, concerning the architectural quality, the historical significance and the state of conservation.

The architectural quality was assessed at the urban and architectural scale, in relation to the following parameters: the urban configuration, the presence of public and community spaces, the typological variety of buildings (residential buildings, but also public, monumental or representative architectures, such as religious buildings, schools, theatres, municipal buildings, etc.). The assessment of architectural quality refers to the typological, formal and technical-constructive characteristics, inspired by local, national or international cultural movements. The evaluation of the historical value is defined, however, in relation to the importance that the village has had in the territorial dynamics, but even more in the context of the national and international scene. Therefore, it turns out to be greater if the village is linked to events – historical, cultural, etc. – of considerable importance, or for its uniqueness, for its pioneering role in the industrial field or, again, as an element that characterizes the history of local communities. Finally, the state of conservation, which is a determining factor in the reflection on the priorities for intervention, is assessed on the basis of the extent of the observed damages. The degree of abandonment (total, partial, seasonal, in progress) and the speed with which this occurs, determines the arising of multiple forms of degradation. Low levels of decay substantially

imply specific manifestations of surface degradation with localized losses of historical material (partial loss of paint or plaster, deterioration of windows and doors, etc.). On the other hand, substantial and widespread collapses correspond to high levels of decay, so much so that it is impossible to recognize the architectural configuration of the individual buildings and, also, of the urban layout[10].

For the same villages, as already mentioned, the intangible value was assessed by consulting the local communities through structured interviews[11]. It was drafted in the form of a questionnaire, with questions, mainly with multiple choices. Specifically, the questionnaire was divided into three main sections: 1. knowledge (7 questions of a general nature, to assess the level of knowledge of the site)[12]; 2. perception (5 specific questions, to assess the sense of 'attachment' to the site and active participation in its protection); 3. representation (17 questions to assess the importance that the local community assigns to the site).

The interview, proposed to the local communities that live in the territory of the 5 villages investigated, had very different results for each site[13], deriving from different factors, namely the different population density of the territorial areas of reference, the location of the sites or, also, the different degree of conservation of the village.

The interpretative matrix - AP

Once the information on the villages and the community-village relationship have been collected, they were processed and transformed into homogeneous data, directly comparable. In order to do this, the experts of the various disciplines involved have codified the variables considered by associating them with a scale of values.

As regards the attributes of the tangible value, the numerical indicators are set according to an increasing evaluation scale (1 = low; 3 = medium; 5 = high). The tangible value is the result of the arithmetic sum of the evaluations of the individual attributes. The minor (5) is attributed to the villages of Santa Chiara del Tirso and Conti Vecchi; the highest in the village of Su Suergiu (11) and intermediate values to those of Gennamari and Pranu Sartu (7; 9).

The numerical indicators that define the attributes of the intangible value are set by

[10] This is the case of Pranu Sartu.

[11] Due to the Covid-19 pandemic, the interview was proposed within the local groups of the social network Facebook, in order to avoid direct contact with people. The choice criterion was based on involving the communities belonging to the *Unione dei Comuni* (local body that gathers several municipalities), where present, or those geographically close to the village.

[12] It is necessary to underline the presence of a bias dependent on the interview tool, i.e. the social network: in fact, the direct interview turns out to be the ideal method, as the visibility of Facebook posts attracts and leads to compilation mostly people who already know the village.

[13] Specifically, a greater involvement has been observed in the area of the Conti Vecchi village, while a little interest was showed by the communities close to Pranu Sartu.

Tab. 1
The interpretative matrix.

VALORE	ATTRIBUTO	VILLAGGIO				
		Su Suergiu	Santa Chiara del Tirso	Saline Contivecchi	Gennamari	Pranu Sartu
materiale	Qualità architettonica	3	5	5	3	1
	Valenza storica	3	5	5	3	3
	Grado di ruderizzazione	1	3	3	5	5
		7	13	13	11	9
immateriale	Conoscenza	3,5	3,3	2,8	2,8	3,5
	Percezione	4,3	2,9	3,4	2,5	2,1
	Rappresentazione	3,7	2,2	2,4	2,7	2,6
		11,5	8,4	8,6	8,1	8,1

associating the higher score (equivalent to 5) to the 'positive' answers, the lower score (equal to 1) to the 'negative' answers and in the case of a 'partial' answer a score equal to 3.

The resulting matrix shows a rather homogeneous situation for all the cases investigated, which can be summarized as follows: a good level of knowledge (although this, as already mentioned, can be given by a bias depending on the social network tool) and a generally negative perception and representation of the villages (Tab. 1). The one that distance itself from this trend is the village of Su Suergiu, where the adaptation of the village as a museum contributes to producing a more positive perception. Thus, the greatest value is attributed to the village of Su Suergiu (11.5), while the other four (Santa Chiara del Tirso, Saline Conti Vecchi, Gennamari and Pranu Sartu) stand on very similar intermediate values (8,4; 8,6; 8,1; 8,1).

These values can provide different interpretative keys. Since by observing the general framework they allow, for those who, for example, work in the field of architecture, to highlight the contrast between the image given by the expert and the one expressed by those who live in those places.

More specifically, however, they provide numerous ideas to support decision-making processes aimed at defining intervention strategies, especially in a systemic manner. In fact, differences in tangible or intangible value can indicate which sites should take priority over others for tangible or intangible interventions. Single values can be composed, with the appropriate calculations, in order to have an overall cultural value, useful for understanding which objects, within the system, emerge in terms of quality or role within communities. But they can also be considered individually: the material value can suggest the

physical interventions through which to act on every object, for example by recommending maintenance programs for Su Suergiu, and restorations or incisive conservation actions for Gennamari and Santa Chiara del Tirso; the intangible value, on the other hand, can favour the implementation of strategies aimed at improving the knowledge and use of these places, accompanying the direct intervention on the cultural assets with a set of actions useful for informing, educating and spreading the history of these places, to improve their knowledge, perception and representation among local communities.

This can be done intuitively, with an aware reading of numerical indices, or through a scientific approach, defining some intervals that can direct and suggest specific interventions. For the latter approach, it is possible to define value ranges to which precise design strategies correspond[14].

Design as research of unity - GBC

In conclusion, the proposed experimentation – despite its declared incompleteness – constitutes a path of action on the 'modification' of the existing heritage that searches for rational methodological approaches, from which to derive decision-making forms appropriate for the fate of the contexts. This allows the interventions to be freed from the ambitions of the individual actors, to root them in the wake of a matured conscience, which advances by questioning the landscapes in their tangible (in their physicality) and intangible (the opinions of the inhabitants) forms.

As known, in fact, the ultimate goal of design is always the search for the unity of the work, not exclusively ascribable to the form – despite its significant nature – but rather to the entirety of the path. In this sense, for example, the encounter between disciplines, as already argued by Gilles Deleuze, does not take place when one of them reflects on the other, but when one "realizes that it has to resolve on its own and with its own means a problem similar to the one that the other also poses" (Deleuze 2017, p. 29). The goal of this encounter of mutual interests, or the greater richness of such a path, lies in the common search for a 'unity' (of method).

For the disciplines of architectural and urban design, the 'interpretative' action proceeds in the 'construction' of new relationships through a conscious reading of the difference between the 'purpose' and the 'finality' of the work, that is the difference between the elements of greatest variability (the use) and those of greater permanence (the reasons for the relationship

[14] As carried out through other in press surveys, three ranges of values corresponding to 1-5, 6-10, 11-15 can be identified which, for example, for the material value can respectively suggest maintenance interventions, conservative restoration actions, or strategies for the adaptation and reuse of cultural assets.

between architectural space and context). This means that the ephemeral difference that separates the action of 'interpreting' from that of 'proposing' is crucial in the search for a possible scenario for these ancient villages.

As has been argued by several authors, architectural design does not research, but finds, and in this investigative action, the meaning attributed to the 'composition' is decisive, in all the declinations that one is able to attribute to it. The problem of adapting the meaning of these 'abandoned villages', therefore, is based on their description, in which the relationship between the parts is fundamental, not only made up of pieces of territory, but also of landscapes, highlighting the 'elective affinities' between past, present and future.

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LANDSCAPE AND CULTURAL IDENTITY - SOME CASES OF WESTERN LIGURIA

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Bussana Vecchia (IM) - photo Lorenza Comino - and detail of Bussana today state - photo Martina Canziani.

Starting from the reasons that led to depopulation and abandonment, the work traces the degradation situations and the intervention strategies pursued in each of the case studies of the province of Savona and Imperia.
In function of the different dynamics, from the immediate and sudden ones due to natural events to the slower ones due to socio-economic and political changes, the several villages have been totally or only partially abandoned, causing very different degradation situations and consequent different intervention strategies. In Balestrino and Bussana Vecchia, totally abandoned, the difficulty in identifying the individual owners has constituted a limit in the possibility of create a uniform design for the entire village or in following the input resulting from the recovery of some public buildings and infrastructures by public administrations. In Castelbianco and Torri Superiore, the investor was able to carry out a single and comprehensive intervention.
Specially the first two cases mentioned open to a further consideration on the role of public administrations in support and guidance activities aimed at the protection, recovery, enhancement of these now abandoned

Keyword: abandoned villages, protection, cultural identity, inland, ghost town

The ghost town's dynamics

The settlement structure of Italy is characterized by the presence of small villages that tell the material and immaterial cultures of the communities in their stratification, in their urban structure and architecture. These villages, starting from the beginning of the twentieth century, recorded the progressive decrease of inhabitants, the reduction of employment and the loss of the connection with the agricultural context.
The municipalities that best represent the described reality are located in Alpine and Apennine regions[1]. According to the Istat's statistics, in January 2019, the Italian municipalities with a population of less than 5.000 inhabitants, a size taken as a reference for small towns, are 5.514 out of a total of 8.000, in which resides 16.5% of the population. Among these,

[1] The areas with the highest number of small municipalities are western Piedmont, Liguria, the province of Sondrio, Friuli, the Apennine areas of central Italy and the internal parts of Sardinia. *Atlante statistico dei comuni*, dati Istat 2019, http://asc.istat.it/asc_BL/

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Fig. 1-2
The abandoned village of Balestrino - general view and the church square - Photo Martina Canziani.

1.954 villages have a population of less than 1.000 inhabitants, a threshold below which it is not possible to guarantee primary services, equal to about 25% of the total, in which resides 1.5% of the Italian population.

Despite the abandonment, the landscape has not completely lost stratification's characteristics and the farming's structure, the routes's organization, the system of settlements, highlighting that the integration between nature and built is still strong and visible. Furthermore, due to the distance from "modernization" processes, these areas have not been involve in the building development of the second half of the twentieth century, a positive fact, for the heritage of traditions and values[2].

Since the 90s, the interest towards these territories changes and a lot of experiences of revitalization of abandoned villages spread in Italy with different intervention approach. They

[2] Settis C., *Battaglie senza eroi: i beni culturali tra istituzioni e profitto*, 2005, Electa, Milano.

range from cases in which homes are sold with promotional advertisements[3], or given under management to private entrepreneurs, to cases in which the inhabitants promote creative opportunities of rebirth, or to rare cases of public intervention. The redevelopment strategies are also diversified: they range from the introduction of handcrafted and artistic productions, to cases of cultural festivals, or to the numerous cases in which the tourist dimension emerges, with the widespread hotel. Rare are the experiences in which the rebirth goes through a structured process of development and enhancement, through the concrete knowledge and analysis of situation and the joint participation of private and public.

The recent economic and social attention for these themes, finds a parallel with the legislative situation that has seen an evolution only in very recent years.

[3] Known is the case of the mayor of Salemi, Vittorio Sgarbi, who was the first to sell, with the obligation to renovate, properties damaged by the 1968 earthquake at a symbolic price of one euro

Fig. 3
General view of the village of Castelvecchio di Rocca Barbena (SV) - photo Martina Canziani.

Fig. 4
The internal paths of Castelvecchio di Rocca Barbena (SV) - photo Lorenza Comino.

Legislation and ministerial actions

At the legislative level, the 1939 law for the protection of natural beauties[4] recognized, for the first time, speaks about the considerable public interest in the immovable things having an "aesthetic and traditional value".

The first effective action to protect historic centers is the "Legge Ponte" in 1967, that provided in historic centers only consolidation and restoration, without altering the volumes.

The subject of historic centers isn't mentioned either in the monumental protection law, no. 1089 of 1939, which mainly refers to individual monuments, nor in the urban planning law no. 1150 of 1942.

Only in 2004, the Code of Cultural Heritage and Landscape, highlight the safeguarding's concept of landscape identity values. Subsequently, in 2008, the Legislative Decree

[4] Art. 1 Law n.1497 of 1939.

n.63[5], explicitly identifies, for the first time, historic centers and cores[6] among landscape assets of considerable public interest.

The first law which include financial measures for the support and enhancement of municipalities with up to 5,000 inhabitants was issued only in 2017[7], with the aim of countering the depopulation, the aging of the resident, the loss of public services through the recovery and requalification of the territory, both natural and built[8].

Talking about the Ministry for Cultural Heritage, the latest actions taken in the field of little towns are the constitution, in 2016, of the "Anno dei Cammini[9]" and, in 2017, of the "Anno dei Borghi italiani"[10]. These initiatives, according with the Strategic Tourism De-

[5] Update of the Code of Cultural Heritage and Landscape, in accordance with the European Landscape Convention, ratified by Italy in 2006.
[6] Art. 136 comma 1 lett. c) del Dlgs 42/2004 e ss.mm.ii.
[7] Law 6 October 2017, n. 158 "Measures for the support and enhancement of small municipalities, as well as provisions for the redevelopment and recovery of the historic centers of the same municipalities.
[8] Despite the positive intentions, by now is still denounced the lack of the implementing decrees, essential above all to unlock the resources: 100 million euros initially planned until 2023 and then increased to 160 million in the Budget law for 2017.
[9] Directive n. 567 of 16 December 2015.
[10] Directive n. 555 of 2 December 2016

Fig. 5
View of the internal paths of Colletta di Castelbianco (SV) - photo Emanuele Piccardo.

Fig. 6
View of the internal paths of Colletta di Castelbianco (SV) - photo Emanuele Piccardo.

velopment Plan and the EU strategic planning, have the aim of enhancing the artistic, cultural, natural and human heritage of the villages and promote the increase of new tourist destinations and employment, as well as the development of tourist-cultural itineraries.

In 2020 the General Secretariat of Mibact publishes a public competition for the financing of redevelopment and growth of the south Italy historic villages interventions[11]. Although aimed only at the villages of southern Italy, this tool, which supports innovative projects that promote socio-economic processes of growth, points the way for further initiatives extended at the whole territory. The various initiatives launched in recent years goes to the direction of participation in knowledge and in the cultural re-appropriation of the villages, favoring the beginning of a participation process to identify good practices and build integrated growth policies.

The examples of western Liguria

The hinterland of western Liguria represents a particular reality within the panorama of ghost or mostly abandoned towns. The process, triggered by the devastating earthquake of 1887[12], had different and overlapping causes: hydrogeological instability, exodus from the countryside to the city, proximity to the coast and to France and, last but not least, the creation of new roads that excluded many localities.

The examples describe below compare different cases for geography of the sites,

[11] Call for villages and historic centers, up to 5,000 inhabitants, which provides funding of up to 30 million euros.
[12] On 23 February 1887 at 06:22, 06:29 and 08:51 three strong earthquakes, with a magnitude between 6.4 Mw and 7.0 Mw, affected Western Liguria.

conservation conditions and protection rules, as well as for the procedures and timing of the transformation processes undertaken to contrast depopulation.
As regards the protection rules in force, it should be emphasized that the only village declared of cultural interest, we could say "entirely monumental", pursuant to the second part of the Code of Cultural Heritage is Bussana Vecchia[13]. All the others cases are subject to landscape protection and declared of notable public interest, pursuant to the third part of the Code of Cultural Heritage[14].

Balestrino (SV)

The Balestrino area is located in the upper Val Neva, along the road that connects the coast with Piedmont. Of Roman origin, the historic center of Balestrino was evacuated in 1953 following an important the landslide of the hill on which it stands[15]. In 1963, yet another landslide event, started the transfer of all the inhabitants to the new houses, built on the edge of the provincial road.
Abandoned for almost forty years, a first attempt to recover the village was launched in 2004 with the signing of a "Protocollo di Intesa" between the Municipality of Balestrino, the Liguria Region, the Soprintendenza, A.R.R.E.D. and A.R.E. Liguria[16] which provided: a program for the safety and accessibility of the village, the research and the creation of the registry of owners, the construction of primary urbanizations. Actions considered essential to trigger the process of re-appropriation of the village. However, the program hesitate to get started, and in 2013 the access to the town was forbidden to the public due to the danger of collapsing. But in the same year was approved the "Piano di Recupero" of the entire village which started in 2015 through urbanization works, financed, with 1.500.000 euro, by Europe, Liguria Region and Municipality. These works had the aim to constitute the first important step to repopulate the ghost town and to encourage private intervention in restoring houses and build up accommodation facilities. The works ended in 2018, but it should be noted that the desired flywheel effect did not occur and the major problems, as well as financial ones, concern the impossibility of involving people, also because there is no certain identification of the properties.

[13] DDG 11/12/2000.
[14] Ministerial Decree 24/04/1985 which declares the territory of the Upper Neva Valley to be of considerable public interest in the municipalities of Albenga, Arnasco, Balestrino, Boissano, Castelbianco, Castelvecchio di Rocca Barbena, Ceriale, Cisano sul Neva, Erli, Loano, Nasino, Onzo, Ortovero, Toirano, Vendone, Zuccarello "- Ministerial Decree 24/04/1985 declaring considerable public interest "the area of Monte Bignone and the heights of the Armea Valley including the ancient settlements of Ceriana, Bussana Vecchia, Poggio, Pigna di Sanremo and Seborga".
[15] Technical periodicals, Ispra, 2011, "Il dissesto geologico e geoambientale in Italia – Liguria".
[16] Memorandum of understanding for the recovery of the old village of Balestrino, 6 luglio 2004.

Castelvecchio di Rocca Barbena(SV)

The municipal area of Castelvecchio di Rocca Barbena develops in the upper Val Neva between the two passes of the Scravaion and San Bernardo, that historically allow communication and trade between Liguria and Piedmont.

The village, of medieval origin, rises around the castle and narrow alleys, also covered by vaults, and directly linked to agricultural work: stone load-bearing structure and portals, terraced roofs, white frames on the windows and characteristic fronts with external ovens for the bread.

The historic nucleus has been progressive abandoned, from about 800 residents in 1863 to about 150 today. After the landslides of the 1950s and the subsequent phenomena of 1963, that affected the central area near the church, with significant collapses of historic houses, new houses were built along the provincial road. The inhabitants were transferred in the new houses, leaving the village uninhabited for a long period.

It was only during the 1990s that some artists, both Italian and foreign, fascinated by the context and by the abandonment, began to re-inhabit the houses in the historic center. A virtuous circle was established which, starting from the passion for art, led to the restauration of some houses and to a new interest in a community, mostly foreigners, who have made Castelvecchio their second home.

Colletta di Castelbianco (SV)

The place name "Colletta" identifies a village developed from the XII century along the axis that dominates from the top of a hill, hence the name, the confluence of the Pennavaira stream with the valley, which connects the sea and Albenga with Piedmont.

The densely aggregated houses, connected by covered passages and external distribution stairs, are characterized by small openings framed by large outlines at the bottom, which become elements that characterize the image of the village. The building is characterized by the presence of the rural housing "type" characterized by the duality of the living-working cell function. On the ground floor there are the stable and the barn, on the intermediate floors the housing functions while, on the top floor, a terrace, are carried out the processing operations of agricultural products.

From the beginning of the twentieth century, Colletta slowly emptied itself, marking 35 inhabitants in the 1951 census and five in the 1971 one.

At the end of the 20th century, a private company buys the entire village, through long adventures to find the owners[17], and starts its overall renovation. The project, signed by the architect Giancarlo De Carlo, through the modification of the distribution methods and of the aggregative composition of the living cells. The original prevalent vertical distribution became horizontal, but the external spaces and the material were preserved, leaving a strong mark of the continuity with the past.
Despite the interesting example of building renovation, still in 2019, on the occasion of the commemoration of the centenary of De Carlo's birth, were announced the "openness of Colletta to any solution to find its true essence and *raison d'etre*"[18]. "The new Collettiani", coming mainly from Italy, but also from other parts of the world, are unable to give the village a new identity, remaining too tied to a touristic concept of revitalization.

Bussana vecchia (IM)
Bussana is a medieval village, perched on a rocky hill, located about 8 km north-east of Sanremo, directly connected to it and to the coast.
Starting from the 19th century, occurred earthquakes of a certain importance, 1831, 1851 and 1854, so much so that the existing buildings were reinforced by introducing arches that connect the houses at the height of the first or second floor. The earthquake of 1887 destroyed the church, the castle and the neighboring houses so that the inhabitants had to abandon their homes. Because of this "Bussana nuova" was built, and the first houses were completed in 1891.
At the end of the 1950s, the Turin ceramist Mario Giani decided to found a community of artists in the abandoned village. His idea has a strong appeal and throughout the 1960s an artistic community settled in the town, headed by the Sicilian painter Vanni Giuffrè. Through the foundation of the "International Community of Artists of Bussana Vecchia", which brings together the artists and endows them with a statute, and the creation of a working cooperative, people begin to live again the houses. The statute impose, to live there, an artistic purposes only and the exclusive use, for the renovation, of the earthquake collapses materials.
Over the years Bussana's artistic vocation is lost; the laboratories remain but the soul of the village turns towards tourism, distorting the initial choice and losing sight of the reconstruction. From the beginning of the eighties the resident population had grown to about a hundred

[17] For the purchase of the entire village it was necessary to reconstruct the genealogical trees of the families of Colletta from 1600, through research at Catasto and Curia of Albenga and Rome, which made it possible to identify the owners and the heirs.
[18] Wiig O.(edited by), *Colletta di Castelbianco*, Print House, Oslo, 2019.

Fig. 7
Bussana Vecchia (IM) - photo Lorenza Comino - and detail of Bussana today state - photo Martina Canziani.

people, not only artists, but also many people who, thinking they could make easy money with summer tourism, open cheap handicraft shops.

Although over the years, interventions have been carried out to connect to the water and electricity networks, the ownership situation is not simple. A dispute begins between owners, occupants and public administrations which, from the first eviction attempts in 1968 to today, has not yet found a solution.

The Municipality of Sanremo in 1982 announces an international competition for the restructuring of the village while in the meantime the "New International Artists Community" is legally recognized, which represent all the inhabitants of the village. In the meantime, to pursue the initial artistic purposes, the association "Laboratorio Aperto" was created. With the association guidelines was established that the entire village is an artistic laboratory.

Fig. 9
Bussana Vecchia (IM) - photo Lorenza Comino - and detail of Bussana today state - photo Martina Canziani.

The Municipality of Sanremo in 2018 prepares an enhancement plan for the village by entrusting the project to the architect Carmen Lanteri. The program is a cultural, historical and identity project aimed at bringing social and economic development. The first steps of the plan indicates interventions to make the territory and the building heritage safe, primary urbanization works and the reopening of passages and streets blocked by collapses. Furthermore, specific interventions are planned in buildings characterized by

architectural relevance, which allow to rethink new functions and to attract private investors. Again in June of this year, meetings were held between the administrators and technicians of the Municipality, the Region and the Ministry, to discuss a program agreement that will serve to protect the common goods and to settle the still unresolved question of the inhabitants and owners.
Within this difficult and unresolved situation, that see at the moment just a touristic place with craft shops, the Ministry for Cultural Heritage, in 2020 started with a restoration project to reduce seismic vulnerability Sant'Egidio's church and the San Giovanni Battista's Oratory.

Torri Superiore (IM)
The medieval village of Torri Superiore, part of the municipality of Ventimiglia, is a small village of rural architecture located in the Val Bevera, a few kilometers from the coast and the French border.
The strategic position for controlling the valley, the stronghold structure, the proximity to the sea and the toponym Torri pluralized by the primitive "ture", suggest that Torri was a military outpost in the medieval period.
The village is structured in three main blocks, which rise up to eight levels above ground, connected by an intricate fabric of stairs, passages, terraces.
At the end of the 18th century the town reached its maximum growth with more than two hundred inhabitants. But the lack of work and the particular geographic location, close to

Fig. 10
General and particular view of the internal paths of the village of Torri Superiore (IM) - photo Simona Lanza.

France and the coast, determined, starting from the nineteenth century, a gradual depopulation that ended after the war.

In the eighties, when a single resident was registered, a couple from Turin were fascinated by the beauty of the village and started a process of rebirth by establishing the "Associazione Culturale Torri Superiore". This association has the objective of restoring and repopulating the village through the creation of a resident community, an ecovillage and a cultural center open to the public. The association's statute shows a significant difference compared to other examples of enhancement because in this case we do not start from the recovery of the architectural and landscape heritage but from the creation of a community. To ensure that the place does not become a place to stay for only a few months a year, the association is committed to promoting collective and individual economic activities that provide for the livelihood of the inhabitants, allowing permanent settlement.

The founders of the association started the project with the purchase of the first houses; rather complicated aspect as the village was divided into multiple properties due to inheritances that were never made functional. The renovation was carried out also thanks to work camps coordinated by the international civil service, environmental organizations and scouting which managed in just 15 years to renovate a large part of the village, which in the meantime was purchased for more than 90%[19].

The project, starting from the study of building structures and construction techniques, made it possible to preserve the existing characteristics and to integrate technologies with low environmental impact. It was necessary to change the distribution of some internal spaces to connect rooms and create internal paths.

The original purpose of the association of supporting the creation of a resident community as well as contributing to the creation of an eco-village can be considered achieved as today the village welcomes about twenty-five residents and a large community of non-residents active in the village.

Conclusions

The comparison between the analyzed cases makes possible to identify different intervention strategies, highlight the common difficulties in implementing projects and the results of the re-appropriation processes.

[19] The purchases were made possible thanks to the work of the community, the personal funds of the associates and the support from the Liguria Region, the Province of Imperia, the Municipality of Ventimiglia, the Municipality of Airole, the Municipality of Olivetta San Michele, ARPAL - Ligurian Environmental Protection Regional Agency.

The common thread that unites the experiences analyzed is the difficulty in identifying the ownership of properties, always characterized by countless segments linked to inheritance, very often unclaimed. The proprietary definition is the first obstacle to overcome, always difficult, long in time and, at times, still not resolved as in Bussana and Balestrino or resolved after more than two years' research in Torri Superiore and Colletta.

The cases presented are also illustrative of various management of the common good.

In Balestrino, the administration of the heritage, shared between institutions, experts and technicians, intervened through public funding with the aim of creating the conditions for private individuals to proceed with the necessary renovations. In Colletta it is the unitary intervention of a private company who acts as a promoter to restore an apparent cultural identity to the village, but without the social connections belonging to a resident community. In Castelvecchio di Rocca Barbena the private intervention for punctual and "bottom-up" interventions lays the foundations for a new cultural identity, in part respecting what was inherited and in part by cutting the roots with the pre-existing agricultural culture. In Bussana the phases of appropriation of the built-up area coincided with the complete transformation of the surrounding landscape and the new interventions, both public and private, can only create a new relationship with the spaces and the existing material, without having cultural connections with the landscape. In Torri Superiore the management of the village shared by a community seems to have succeeded in building new identity, cultural and social ties.

It is evident that a lasting development strategy can be designed and implemented only with the reconstruction of a local community. So far, in most cases, the interventions have been focused more on the built, on living a space that evokes sensations but rarely on producing a new cultural identity of the resident communities in continuity with the past and with the aim of creating a lasting future. Strategies of conscious renewal of cultural values are needed in a process of integration, without them the interventions remain only a material renewal and structural reinforcement.

In this sense, resilience assumes the meaning of adaptability, participation in the construction of collective identity, which requires the ability to analyze the present and at the same time make the "new inhabitants" aware of their future.

In this context, the initiatives of the Ministry for Cultural Heritage are inserted, mainly aimed at the recognition and knowledge of abandoned villages, indispensable aspects for promoting future restructuring and enhancement strategies not only of the village but also of the landscape and the social aspects of which spatiality and the materiality of the village are, at the same time, an integral and generating part.

From this point of view, two notable evolutions are significant: the first of a regulatory nature and the second organizational. With Legislative Decree 62/2008[20] "expressions of collective identity" are introduced, as identified by the Unesco Conventions of 2003 and 2005[21], among the assets subject to the protection provisions if they are represented by material evidence. In accordance with this, from 2016, the Central Institute for Intangible Heritage becomes part of the Ministry for Cultural Heritage and Activities. The acknowledgment of the Ethno-Anthropological heritage as a Cultural Asset, like "tangible" assets, highlights the evolution of the interest in the complexity of the entire human action and feeling, as evidence of a complex social and cultural world.

It is evident that the operations to enhance the villages cannot ignore the involvement of local communities, as caretaker of socio-cultural values, which must be kept alive and made a driving force for the re-appropriation of the territory. Otherwise the risk is that the renovation generates a loss, in addition to historical-cultural and landscape value, of a social resource, in which a memory linked, above all, to materical settled, triggers a new abandonment determined by the lack of a new cultural identity and a link with the territory.

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RÉFLEXIONS SUR LES TREMBLEMENTS DE TERRE, ABANDONS ET IDENTITÉ À TRAVERS QUELQUES ÉTUDES DE CAS EN IRPINIA

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Bisaccia, vue d'ensemble de l'ancien centre urbain (© S. Cassese).

Irpinia is a territory characterized by a strong landscape, urban and cultural identity and, at the same time, subject to a strong seismic risk due to the high seismicity of the area as its frequent earthquakes demonstrate. An internal area that suffers from a continuous cultural distortion due to the recurrence of reconstruction processes and the territorial, urban and architectural structure that differs from the characteristics of that specific landscape. For all these reasons it represents an important observatory aimed at mitigating environmental risk due to the abandonment of the historic centers which it has been witnessing for years with the disappearance of the communities that live there and with the progressive degradation of the monumental heritage that affects many of its interesting medieval villages.

The landscape identity is still made up of spaces of great naturalistic value that unites all the settlements of the territory, scattered with numerous small villages perched around the medieval castle and delimited by the waterways that flow at its feet, characteristic for their simple stone houses uniformly leaning against each other that draw the planimetric trend of the streets, from the churches with the soaring bell towers, the alleys, its ancient portals in stone worked with skillful skill by the local stonemasons and by the square center of social life and center of the urban structure where the facades of the most representative noble palaces are concentrated.

This is how the image of the small crib towns of the province of Avellino appears, a tangible testimony of a material culture built on the peasant civilization and consolidated by a secular history that originates from the distant Middle Ages.

The greatest risk that occurs in the event of disasters, is that related to the loss of historical evidence, in its broadest sense, which affects both the individual monument or the work of art, as well as the entire urban center, even extending to the surrounding natural landscape.

On this geomorphologically varied territory, the signs left by seismic events (1930, 1962, 1980) are still visible, particularly inclement, and by reconstruction interventions. These traces clearly show the signs of the deep scars of the various catastrophes and are the tangible testimony of urban and landscape changes.

Irpinia tells us all this with precision, presenting us with a scenario full of indications, suggestions, errors and good examples that help us understand the transformations that have taken place, the reading of which can be aimed at acquiring new intervention tools for mitigation environmental risk to avoid the loss of identity of places and landscapes. Past experiences (earthquake of July 23, 1930 in Aquilonia), recent (earthquake of August 21, 1962 in Melito Irpino) and nearby post-earthquake reconstructions in Irpinia (earthquake of November 23, 1980 in Bisaccia), demonstrate how damage to identity places can be amplified rather than restored and revitalized by the reconstruction processes, if they cannot make use of a strong and consolidated environmental architectural culture, and of an already organized heritage of knowledge and intervention methodologies.

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Les séismes historiques de l'Apennin méridional (© Istituto Nazionale di Geofisica e Vulcanologia).

The essay analyzes the relationship between the new and abandoned nuclei and between the surviving parts of the ancient villages affected by the earthquakes and those rebuilt, as part of the debate on the reconstruction of the countries affected by the recent earthquakes.

Mots clés: Irpinia, tremblement de terre, villages abandonnés, dépeuplement, mémoire historique.

Aquilonia, cerclè blanc l'ancien établissement urbain de Carbonara (© Google Maps).

Notre pays, comme on le sait, est fréquemment soumis à des phénomènes sismiques cycliques: malheureusement, la population italienne a toujours appris à vivre avec des catastrophes, depuis des millénaires (Boschi *et al*., 2000, pp. 609-868).

Les ruines sismiques dévoilent soudainement tous les problèmes d'un territoire donné, parce qu'elles accélèrent et déplacent différents types de conflits et d'intérêts. Observées sur le long terme, les reconstructions consentent de mieux comprendre la vie et les mutations des sociétés du passé. L'histoire n'est probablement pas le seul outil de connaissance pour faire la lumière sur la complexité de ces situations douloureuses induites par l'une ou l'autre forme de destruction. Les historiens, cependant, peuvent analyser au moins les éléments clés pour mieux comprendre les changements d'une société, la vie de ses lieux et, par conséquent, la relation avec l'environnement naturel géomorphologiquement sensible. Du siècle passé à aujourd'hui, on note toutefois une sorte d'incapacité

sociale à réagir de manière adéquate à ces événements extraordinaires qui, en plus de causer de graves pertes humaines et des dommages matériels importants, ont également des conséquences substantielles sur le milieu physique et une forte incidence sur la santé mentale des populations. Les répercussions matérielles et immatérielles qui en découlent affectent divers niveaux de la vie urbaine et influencent de manière diverse par rapport aux caractéristiques multiformes inhérentes à la société elle-même. Malgré la fréquence des phénomènes catastrophiques, le pays n'a pas réussi à développer une prise de conscience sur la question et a tendance à procéder au cas par cas, souvent, comme nous le verrons, de manière désordonnée et confuse, chaque fois qu'un tremblement de terre d'une certaine intensité se manifeste. Cela s'est également produit là où, comme en Irpinia, il y a eu une récidive de destruction de parties ou de lotissements entiers déjà affectés par le passé. Ces événements douloureux, en revanche, auraient pu permettre, avant tout à la communauté et aux organismes chargés de la reconstruction, une identification correcte des problèmes et, donc, une juste hiérarchisation en termes de priorités afin de trouver la meilleure solution possible (Tertulliani, 2016, pp. 23-32).

L'Irpinia est une région historico-géographique de l'Italie méridionale, correspondant aujourd'hui avec une bonne approximation à l'actuelle province d'Avellino; elle est considérée comme une zone à forte densité sismique. Figurant dans la liste des 175 districts sismiques italiens, le territoire provincial compte 118 communes dont 58 sont classées par le

Melito Irpino, cerclé blanc l'ancien établissement urbain (© Google Maps).

Département de la protection civile comme étant à haut risque sismique. Le territoire se caractérise aussi par une forte identité paysagère, urbaine et culturelle, avec une grande valence naturaliste qui unit toutes les centres habités, témoignage tangible de la civilisation paysanne, stratifiée et consolidée dans le temps. (Picariello, Laudadio, 1996).
Un exemple très éloquent, à la fois pour la forte sismicité de la zone, qui a entrainé l'effet d'une perte culturelle, et pour l'éventualité de la répétition des processus de restauration, de reconstruction et d'abandon de biens territoriaux d'origine, nous est proposé par certains sites de la province d'Avellino.

Bisaccia, nouveau et ancien établissement urbain (© Google Maps).

Il s'agit de petits villages-crèches, généralement perchés autour de la falaise des châteaux médiévaux, caractéristiques grâce à leurs bâtiments, églises, clochers, ruelles, portails savamment travaillés en pierre et leurs places, véritable pivot de la vie sociale et centre de la vie communautaire. Des agglomérations urbaines qui ont l'expérience commune d'avoir été, au siècle précédent, entièrement ou partiellement détruit par de événements telluriques violents, pour ensuite être reconstruites à quelques kilomètres du site originaire, avec le triste résultat d'avoir perdu parmi les décombres leur sens de la communauté, leur identité collective. Ainsi, les villages typiques qui jalonnaient les reliefs de la région d'Irpinia ont presque totalement disparu et, à leur place, sont apparus de

nouveaux bâtiments, reconstruits avec d'autres typologies et conçus en espaces élargis dans lesquels la population a encore du mal à s'identifier et, donc, à vivre (Arminio, 2003).
Sur ce territoire géomorphologiquement varié, les signes laissés par les événements sismiques (1930, 1962, 1980) et par les interventions de reconstruction sont bien visibles (Gizzi, Potenza, Zotta, 2016, pp. 51-68). Ces traces mettent en évidence les profondes cicatrices résultant des différents séismes et témoignent les changements urbains et paysagers que le patrimoine bâti a subis au fil des ans. Certaines des implantations urbaines ont été complètement abandonnées et reconstruites ailleurs, devenant de véritables lieux paradigmatiques de la reconstruction irpinienne: Aquilonia (dépeuplée et reconstruite à 2 kilomètres après le tremblement de terre du 23 juillet 1930), Melito Irpino (dépeuplée et reconstruite à 3 kilomètres après le tremblement de terre du 21 août 1962), Bisaccia et Conza della Campania (dépeuplées et reconstruites respectivement à 3 et 4 kilomètres après le séisme du 23 novembre 1980).
Tout ou presque a déjà été dit sur les différents tremblements de terre en Irpinia (Mazzoleni, Sepe, 2005). Je doute fort que nous puissions encore, aujourd'hui, faire de nouvelles propositions à ce propos ou formuler de nouvelles évaluations critiques. Généralement, si, d'une part, le tremblement de terre détermine une zone fortement compromise, il dessine, d'autre

Conza, cerclé blanc l'ancien établissement urbain (© Google Maps).

part, un moment d'idées extrêmement dynamique et fertile dans lequel divers sujets s'activent et se confrontent pour trouver des solutions capables de répondre, dans la mesure du possible, aux besoins qui surgissent à la fois dans la phase d'urgence et dans la phase posthume de la reconstruction. En Irpinia, cependant, ce qui embarrasse immédiatement ceux qui se préparent à étudier, pour la première fois, les tremblements de terre et les abandons consécutifs dus aux tremblements de terre d'un point de vue historique c'est le constat amer que, au cours de près d'un siècle d'expérience, il n'y a pas eu de progrès substantiel dans la manière de gérer la question sismique (Coletta, 2010). Cela a en effet conduit, dans certains cas particuliers, une évaluation négligente et inexacte du problème avec l'abandon consécutif de l'ancien site au profit de localités jugées plus sûres, même si elles ne sont situées qu'à quelques kilomètres des implantations d'origine. Le territoire, frappé par les nombreux tremblements de terre survenus surtout au cours du XXème siècle, a, après un certain temps, présenté le compte. Avant le siècle passé, les populations touchées par des catastrophes pareilles décidèrent de se transférer ailleurs et d'abandonner leurs habitations d'origine. Au contraire, lors des derniers séismes de 1930, 1962 et 1980, les habitants des lieux touchés ont eu une plus grande propension à reconstruire de la même manière et dans les mêmes sites, comme s'ils voulaient défier les

Aquilonia-Carbonara, cartes postales de l'éditions Omnium, 1925 (© Archivio fotografico MEdA, B. Tartaglia).

forces de la nature au nom d'un attachement à leurs racines, à leur propre identité. Les motivations de ces choix orientés vers les lieux originaires étaient surtout culturelles, comme le sentiment d'attachement de la communauté à son habitat, ou plus spécifiquement économiques, comme le manque d'alternatives de travail adéquates difficilement reproductibles dans un autre site ou encore la rareté des ressources mises à disposition (Verderosa, 2005, pp. 316-328).

Le phénomène de l'abandon offre la possibilité de faire des réflexions utiles sur les effets à moyen et à long terme que peut entraîner la reconstruction *ex novo* des petites villes démolies par les tremblements de terre.

L'Irpinia raconte ce qui s'est passé sur son territoire, avec une précision et une fréquence quasi régulières, offrant un scénario riche d'indications mais aussi d'avertissements, des échecs et des bonnes pratiques dont la lecture à travers le temps peut être intéressante pour apprendre de nouveaux outils d'intervention afin d'éviter une reproduction exacte des mêmes erreurs.

La recherche a analysé les études de cas d'Aquilonia, Melito Irpino, Bisaccia et Conza della Campania en Irpinia, mettant en évidence les questions sociales, économiques et environnementales déclenchées à partir des reconstructions sur un autre site après les tremblements de

Aquilonia-Carbonara, l'église mère après le tremblement de terre du 1930 (© Archivio fotografico MEdA, B. Tartaglia).

Melito Irpino, centre historique de la vieille ville abandonnée suite au tremblement de terre du 1962.

terre tragiques du siècle dernier, dynamiques comportementales communes à de nombreuses autres régions de l'intérieur de l'Italie (Bassanelli, 2009).

Toutefois, dans la plupart des cas, l'attention des institutions responsables et, plus généralement, de l'opinion publique s'est davantage concentrée sur les aspects matériels liés à l'événement plutôt que intensifier les efforts pour se réapproprier de la mémoire collective également à travers de simples actions régénératrices, pour ne pas courir le risque d'assister à la disparition irrémédiable de l'intégralité du patrimoine identitaire de ces lieux historiques. Il est tout à fait évident qu'il existe des problèmes encore plus complexes par rapport à l'identification des coupables du manque de rapidité des secours, de l'adéquation structurelle des bâtiments, de la responsabilité des effondrements, etc. Les expériences traumatisantes auxquelles les populations touchées par les catastrophes naturelles sont obligées de faire face immédiatement, arrachées aux lieux et aux choses d'une vie et transférées dans de nouveaux contextes, affectent la sphère émotionnelle et se traduisent par une souffrance qui ne laisse pas de signes physiologiques, mais bouleverse l'homme dans sa complexité, ou plutôt tend à effacer sa personnalité, voire son identité.

L'une des stratégies à suivre pour un réaménagement correct des sites abandonnés pourrait être la réappropriation des lieux passés, première étape essentielle dans la protection du patrimoine culturel identitaire (Teti, 2004).

C'est désormais une certitude que le désintérêt pour la beauté et pour l'attachement aux lieux où l'on vit est le premier pas déterminant vers le déracinement de l'identité de la personne. L'un des facteurs qui déterminent le manque de liens avec la terre natale est l'absence totale du sens d'appartenance qui a souvent détruit le visage de nombreux centres urbains du Bel Paese, créant des situations intolérables qui sont responsables des modifications du paysage qui n'est plus capable de concilier les équilibres naturels du passé avec ceux du présent et du futur. C'est justement la reconnaissance du patrimoine culturel, en tant qu'ensemble d'éléments matériels et immatériels reconnus comme ayant la capacité d'incarner les valeurs culturelles d'une communauté, l'essence première de l'ensemble composite et multiforme de mémoires et de traditions populaires correspondant à un lieu et à une population donnée, qui détermine le facteur identitaire de l'individu. En effet, l'identité et la personnalité de chaque personne se construisent à travers une participation active à la culture collective, contribuant à les façonner et à les structurer au fil du temps et, par la même occasion, les acceptant comme communes. Dans cette perspective, le patrimoine culturel est substantiellement la valeur liée à la capacité des habitants, considérés comme individus ou associés en groupes, à matérialiser leurs idées, en les intégrant dans la culture commune. Ce n'est, donc, qu'à travers une connaissance approfondie des lieux qu'on doit et qu'on peut recréer ce sens de l'appartenance autour duquel il est possible de reconstruire le tissu social,

Bisaccia, habitations construites après le tremblement de terre du 1980.

en faisant renaître des usages, des coutumes et des traditions; choisir les espaces et les structures à valoriser, mais aussi les dénominateurs communs nécessaires à la nouvelle configuration architecturale sur lesquels matérialiser une durabilité environnementale, économique et sociale; établir un calendrier de travail détaillé des interventions à exécuter pour planifier de façon optimale les ressources disponibles.

Probablement, il faut intervenir avec des idées nouvelles qui considèrent, rationnellement, les besoins et les ressources concrètes des populations qui y vivent en procédant à la démolition de tout ce qui a été fait de contre-productif et désavantageux, renforcer autant que possible le tissu de la densité urbaine, monstrueusement ouverts et dilatés par les différentes interventions de reconstruction post-sismique, dans le respect des besoins réels des communautés (Matarazzo, 2019, pp. 3-50). Aujourd'hui, avec une conscience mûrie et réelle d'apprendre à vivre avec les aléas de la nature, les petits villages et les endroits abandonnés jouent le rôle de véritables espaces de mémoire qui, en tant que tels, méritent d'être traités et repensés dans le respect des nombreuses victimes et de ceux qui,

bien qu'ayant survécu, ont vu disparaitre en quelques secondes les rêves d'une vie (Guidoboni, 2016, pp. 415-444).

En conclusion, les résultats des reconstructions dans un autre site des petits villages n'ont pas satisfait les besoins et les exigences des citoyens qui y vivent. Il y a de nombreux jugements négatifs sur la construction des nouvelles implantations dans lesquelles on relève une nette sensation de perte et de solitude, car les habitants ont du mal à se reconnaître et à se retrouver dans les endroits où ils ont toujours vécu. Au siècle dernier, à l'issue du séisme, le prix que les habitants de l'Irpinia ont dû payer, au nom de la sécurité, a été très élevé. Les repères des petites villes abandonnées, autour desquelles toute la communauté avait construit son identité, ont été entièrement perdus avec l'histoire et les traditions séculaires, engendrant une perte totale de ces relations sociales et économiques qui, durant des années, ont fortement lié l'homme aux sites où il a vécu et vit encore aujourd'hui. La place, le château, l'église et le clocher avec les ruelles sinueuses, qui formaient le cœur battant des villages, ont peu à peu cédé la place à la misère froide des architectures réalisées dans le désordre pour faire place aux constructions nouvelles et inanimées. L'identité de ces lieux est irrémédiablement perdue, effacée. La poussière et les gravats l'ont enterrée puis enlevée en quelques jours, avec les rêves et les aspirations des habitants qui y vivaient (Barca, 2018, pp. 551-566).

Cependant, dans ce tableau alarmant, nous pensons que les communautés frappées par des événements extraordinaires, comme les tremblements de terre, à la suite même des expériences les plus marquantes qu'elles ont durement vécues, sont les seules porteuses de l'identité des lieux et, par conséquent, les seules à posséder des énergies positives notables en termes de temps, d'idées et de compétences, c'est-à-dire les plus aptes à élaborer une réaction efficace aux problèmes contingents qui les concernent pour éviter les abandons continus auxquels nous assistons impuissants depuis longtemps dans plusieurs régions d'Italie.

En conclusion, l'histoire des destructions sismiques dans la province d'Avellino est pleine de difficultés et de tragédies, c'est une histoire qui doit être interprétée avec de nouvelles catégories d'analyse. D'une part, on peut souligner la capacité incontestable à faire preuve de résistance et de ténacité de la population irpine, son désir de se redresser et de survivre, mais, d'autre part, la succession des destructions sismiques au cours des siècles montre un rapport culturel déformé avec le futur, qui ne semble pas avoir changé de manière significative au cours du temps, presque une incapacité de la part des institutions et de la collectivité à prendre conscience des dégâts futurs possibles avant qu'ils ne se reproduisent.

Bisaccia, urbanisation après le tremblement de terre du 1980 (© Archivio Studio Verderosa).

Bref excursus sur les études de cas de Carbonara aujourd'hui Aquilonia, Melito Irpino, Bisaccia et Conza della Campania dans la province d'Avellino.

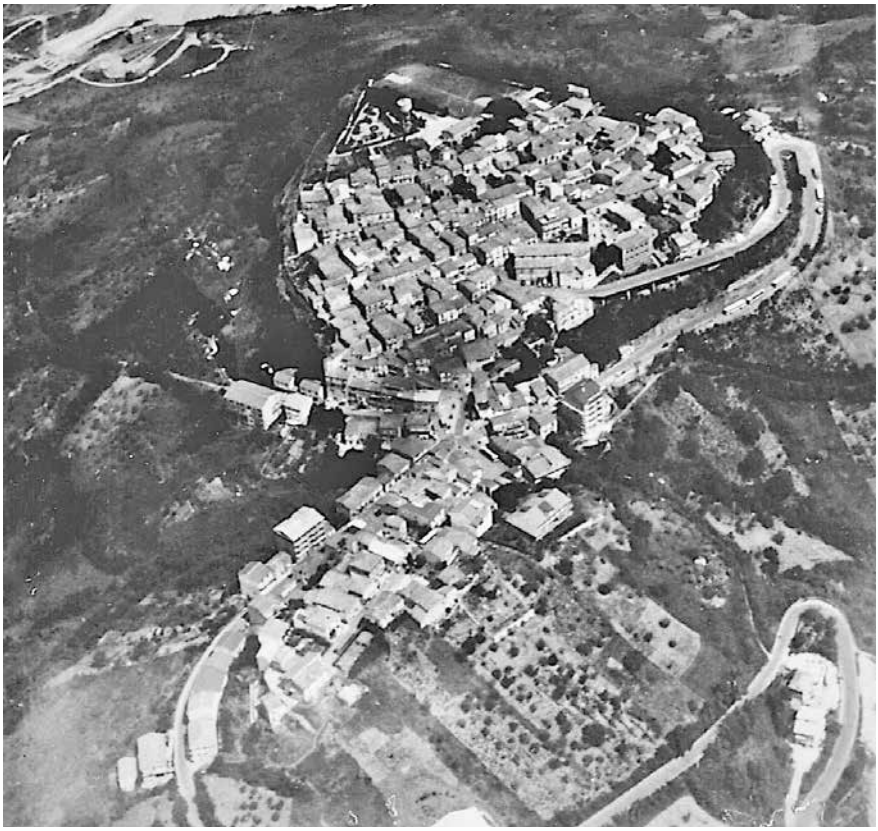
Examinons brièvement les quatre implantations irpines dans lesquelles se sont produits des cas d'abandon des centres urbains d'origine, à la suite des différents séismes de 1930, 1962 et 1980, et la reconstruction consécutive *ex novo* de la nouvelle ville.

Carbonara aujourd'hui Aquilonia

Le village est un petit centre urbain de la Haute Irpinia, située sur une crête rocheuse à environ 750 mètres d'altitude (Amore, Fabbricatti 2019, pp. 41-51). Partiellement détruite par de forts tremblements de terre survenus aux XIVème et XVème siècles, elle a été reconstruite en 1627 puis, à nouveau, presque totalement rasée par un autre événement tellurique. Elle fut à nouveau touchée par les tremblements de terre de 1702, 1732, 1851 et 1857, mais à chaque fois elle fut reconstruite par ses habitants, jusqu'au tremblement de terre de 1930 qui la détruisit presque complètement.

En Aquilonie aussi, depuis la moitié des années 1990, en lien avec les phénomènes culturels liés à la redécouverte des régions de l'intérieur qui ont caractérisé l'ensemble du territoire italien au cours des dernières décennies, des initiatives ont été développées

par des individus et des groupes de jeunes destinées à récupérer une identité communautaire qui manquait depuis plusieurs générations.
Il s'agit d'un phénomène complexe, ayant une double nature: d'une part, la volonté de réparer la lacération que la population avait subie avec l'abandon forcé de l'ancien centre de Carbonara, par une tentative de connaître son histoire séculaire et, de l'autre, la proposition de projets innovants pour stimuler la renaissance sociale, économique et culturelle de tout le territoire voisin.
La sensibilité renouvelée à l'encontre de l'histoire de ses racines se concrétisa dans la collection d'objets et d'outils trouvés dans les "cases asismiques" à démolir, qui à leur tour représentaient les biens matériels qui ont échappé au séisme de 1930, utilisés pour la réalisation du "Musée ethnographique Beniamino Tartaglia", aujourd'hui encore l'un des endroits les plus intéressants pour regarder et étudier la culture paysanne de la province d'Avellino et de ses environs, pour ses collections et ses modes d'exposition.
Parmi les projets menés par les citoyens d'Aquilonia eux-mêmes pour récupérer une mémoire collective et, en même temps, soutenir le développement culturel, économique et social de l'ancien village, nous nous sommes intéressé au plan de revitalisation de la réutilisation des ruines à travers l'insertion de capsules d'habitation particulières énergétiquement autonomes, c'est-à-dire capables de générer la culture matérielle du territoire avec des boutiques d'artisanat, donnant vie à un modèle généralisé en mesure d'impliquer la majorité du tissu productif de la région. Les capsules, réalisées sur mesure selon les cas et répondant aux besoins contemporains, auraient garanti la pérennité des savoirs locaux et, par là même, assuré la reconnaissance de l'intervention dans un scénario de développement partagé.
L'enthousiasme renouvelé a également eu ses effets sur le village abandonné de Carbonara-Aquilonia, avec l'aménagement du plus ancien noyau en parc archéologique, la restauration et la reconversion du Palazzo Alibino en Musée des villes itinérantes.
Les initiatives intéressantes décrites témoignent de la vivacité des propositions des associations locales qui ne bénéficient, cependant, pas d'initiatives politiques de soutien et de développement sur le moyen-long terme. Malheureusement, les données consultées révèlent que la population résidente d'Aquilonia a diminué au cours des vingt dernières années dans des proportions plus élevées que la moyenne de la baisse enregistrée dans la province d'Avellino. L'état de conservation de l'ancien village empire d'année en année par manque d'entretien et, surtout, à cause de l'absence totale d'une vision stratégique de manière organique du territoire.
En conclusion, l'exemple d'Aquilonia, qui à quatre-vingt-dix ans de sa refondation est toujours à la recherche de sa propre identité, représente, dans ce sens, un exemple emblématique,



Conza, vue aérienne avant le tremblement de terre du 1980 (© Archivio Studio Verderosa).

notamment pour les petits centres urbains touchés par les récents tremblements de terre le long de la crête des Apennins, pour lequel on espère que les interventions de reconstruction pourront sauvegarder le tissu urbain et les liens avec le paysage préexistant au séisme. Les outils de gouvernance du territoire deviennent, alors, indispensables pour mettre en œuvre des mécanismes capables de déclencher des dynamiques vitales entre les différents acteurs, fondées sur la régénération de l'identité collective et sur la capacité à être en phase avec cette évolution.

Melito Irpino

Le deuxième petit village à l'étude aborde également la question complexe de la reconstruction hors site (De Feo, 2005, pp. 367-386). La nouvelle Melito Irpino, dans la province d'Avellino, a été entièrement reconstruite après le tremblement de terre de 1962

qui en a décrété le transfert. Les raisons qui sont à l'origine de la décision de construire un nouvel établissement urbain dans un lieu situé à environ trois kilomètres de l'ancien furent diverses: les conditions géologiques précaires du territoire et du peuplement, le régime désordonné des eaux, la consistance et l'âge des bâtiments et les difficultés d'accès qui avaient rendu le centre historique presque inhabitable. Un endroit plat fut choisi, à 500 mètres au-dessus du niveau de la mer, dans une position décentrée, construit sur le haut-plateau derrière l'implantation d'origine. Le vieux centre de Melito, avec l'ancien château médiéval, l'église et le clocher qui surplombait la vallée du fleuve Ufita, en face du pont qui la traverse pour atteindre Bonito, fut totalement abandonné au lendemain du tremblement de terre.
Ainsi, le vieux centre urbain n'existe plus, sauf dans les souvenirs des gens qui y vivaient. À ce jour, on note la démolition presque totale de tous les anciens bâtiments.
Ce qui a été fait a pris la forme d'un déracinement, une rupture avec le passé qui a rendu le transfert de la population, même si c'était à quelques kilomètres, comparable à une délocalisation située à des milliers de kilomètres. Il s'agit d'un système urbain simple, structuré par une rocade qui, contenant le centre, avec les espaces et les édifices publics, l'église, les écoles et la mairie, donnait l'accès à chaque unité de quartier avec différents types de bâtiments, composés de maisons mitoyennes avec un jardin à l'avant et à l'arrière. L'idée qui préside à cette conception de base a abandonné l'ancienne disposition qui reposait sur l'unité du voisinage et créa un réseau routier basé sur des rues trop larges, de nombreux espaces verts sans conception préétablie et une absence totale d'espaces publics qui a généré une absence d'agrégation sociale.
Une idée pour redonner un nouveau souffle à un tissu qui ne répond pas aux besoins des citoyens qui l'habitent serait d'imaginer un renforcement du noyau urbain par des structures publiques, des chemins et des espaces verts équipés qui reprennent certains des caractères et éléments du vieux centre, des bruits, des images, des coutumes qui émergent dans les souvenirs des gens. Restructurer le réseau routier et introduire des activités capables de créer une agrégation sociale, de façon à proposer des lieux de rencontre pour des événements culturels et des spectacles en plein air, avec des aménagements de verdure publique, en continuité avec les jardins privés qui sont aujourd'hui la nouvelle découverte et la fierté du centre refondé. Mais il faut, en même temps, agir également sur le centre urbain d'origine de Melito, à partir des aspirations des gens, avec la récupération du château et de l'église du vieux Melito, le premier comme structure de formation et de culture à l'échelle du quartier, le second comme salle de conférence et de réunions publiques, sans oublier l'aménagement de la digue du fleuve Ufita, ce qui va restituer aux habitants les signes originaux de l'histoire, ou plutôt de la mémoire identitaire.

Bisaccia

À Bisaccia, à cause d'un précédent et important phénomène actif de glissement de terrain, il a été décidé de récupérer une partie du noyau d'origine articulé autour du château ducal et de construire la Nouvelle Bisaccia dans une zone géologiquement sûre, identifiée comme telle par un précédent plan réglementaire des années 1930 et située sur une colline à quelques kilomètres, près de l'hôpital. Le dessin urbain de la Nouvelle Bisaccia pris à la suite du tremblement de terre de novembre 1980, selon les termes de son auteur, a une forme dynamique, ouverte, centrée sur des places et des édifices publics répartis en noeuds stratégiques (Belfiore, 2005, pp. 284-291).
L'église, le centre social, l'école maternelle, la crèche et certains quartiers résidentiels ont leur propre qualité évidente et leur cachet formel, tout comme la centrale téléphonique à mi-chemin entre l'ancienne et la nouvelle ville et l'ossuaire du cimetière. Actuellement, l'ancienne ville a retrouvé sa vie après l'inévitable stagnation due au tremblement de terre et à la reconstruction successive. La Nouvelle Bisaccia est à un peu plus de 50 % construite, mais par parties et de manière désordonnée: les zones déjà habitées et consolidées côtoient de grands vides en attente des interventions prévues dans le Plan. On signale encore quelques chantiers de bâtiments publics commencés et jamais terminés et on trouve, enfin, des insertions de constructions abusives récentes et quelques maisons rurales anciennes, et aujourd'hui comme intruses, qui ont survécu au tremblement de terre et à la ferveur de la reconstruction qui a suivi. Le nouveau village est habité mais ne fonctionne pas. Les habitants qui vivaient autrefois dans des maisons paysannes sobres mais grandes et spacieuses sont à présent contraints de vivre dans quelques mètres carrés et dans des petites abitations qui partagent un ou plusieurs murs communs avec les maisons voisines.

Conza della Campania

L'histoire sismique de la petite ville de Conza della Campania a toujours été caractérisée par des intensités importantes jusqu'au IXème degré de l'échelle Mercalli, à la suite des événements de 1466, 1517, 1694 et 1732, tous avec un épicentre entre l'Irpinia et la Basilicate (Carluccio, 2002). Conza se dresse aujourd'hui sur une double colline à 608 mètres d'altitude, elle domine la haute vallée de l'Ofanto. Le centre urbain, qui subit d'énormes dégâts le 23 novembre 1980, se trouvait à seulement 9 kilomètres de l'épicentre du tremblement de terre de 1980, situé à Laviano en Basilicate. Outre la perte de nombreuses vies humaines, il y eut la destruction quasi totale du patrimoine bâti fragilisé par la mauvaise qualité des logements et par les conditions géomorphologiques

particulières dans lesquelles la ville a été construite: deux collines constituées d'une alternance de terrains extrêmement hétérogènes et pauvres. Dans le centre historique de Conza della Campania, la cathédrale, le clocher adjacent et l'église des Âmes du Purgatoire s'effondrèrent presque complètement. Toute la zone habitée fut évacuée et, lors des travaux de reconstruction, il a également fallu démolir les quelques bâtiments restés debout. Après le tremblement de terre, les habitants de Conza choisirent de déplacer la vieille ville, en construisant la nouvelle plus en aval, à Piano delle Briglie, située à 4 km du noyau d'origine, une localité considérée comme plus sûre du point de vue géosismique.

La nouvelle ville a été conçue avec des routes larges et rectilignes, des maisons unifamiliales avec diverses typologies, des bâtiments modernes monumentaux et des espaces publics improbables: les principaux axes routiers, constitués de rues larges et droites, sont répartis de façon concentrique autour de la nouvelle place de forme triangulaire. Au premier plan, on a placé l'église puis les magasins, le marché, les ateliers d'artisanat et les autres édifices publics. Les quatre secteurs résidentiels ont été conçus autour de cette agglomération, confiés à différents designers et desservis, eux aussi, par un réseau dense de routes et de parcours piétons. En plus de la planification urbanistique de base, deux interventions importantes ont été conçues et réalisées: la première était représentée par le parc archéologique qui devait s'élever sur les restes de l'ancien centre historique, inauguré en juillet 2004, tandis qu'une autre construction a consisté en l'aménagement du barrage du lac, avec la création d'une oasis naturelle du WWF.

La communauté a valorisé l'ancien noyau urbain sur le plan touristique, également grâce à la redécouverte du parc archéologique de Conza d'origine romaine. De l'ancien centre habité subsiste, en fait, un parc archéologique découvert après le tremblement de terre, il comporte un forum et un amphithéâtre qui ont émergé au milieu des ruines fantomatiques des maisons. Le lien existant entre les deux villes, *Compsa* romaine et Conza, demeure, pour le moment, uniquement visuel et non fonctionnel ou structurel et le parc archéologique lui-même, incomplet, ne suffit pas à lui seul, bien qu'il soit riche en valeurs archéologiques. L'idée du parc archéologique sur la zone de la vieille ville de Conza exerce, sans doute, une grande fascination, non seulement en raison des vestiges romains, mais aussi pour la présence simultanée de traces appartenant à différentes périodes historiques et qui pourraient servir de locomotive touristique et économique pour tout le territoire.

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Castiglioncello
Diaterna
Brento Sanico
Pratalecchia
FIRENZUOLA
Santerno
Rovigo
Futa pass
Giogo pass

TRADITIONAL MASONRY BUILDINGS ON THE TUSCAN APENNINE MOUNTAINS. THE ABANDONED VILLAGES AROUND FIRENZUOLA

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Università degli Studi di Firenze-Italia

The upper valley of Santerno river with the villages investigated (map from Regione Toscana).

This work is part of an ongoing project developed by a team made up of researchers, young undergraduates and fellows from the Department of Architecture of the University of Florence. The general aim is to provide a contribution to the knowledge of the rural architecture of Upper Mugello to enhance more aware recovery actions. The investigation concerns the recovery of building techniques, the preservation of the authentic characters of ruined buildings and the development of maintenance procedures. The focus area is the territory of Firenzuola, along the Santerno river and its main tributaries. Several abandoned villages have been identified as case studies, including Pratalecchia, Brento Sanico and Castiglioncello. The research is set up in two parallel actions of investigation: the first is dedicated to the study of documentary sources for the reconstruction of the historical and construction events of the settlements, the second is aimed at the direct study of the buildings. The results of the first investigations carried out on the village of Pratalecchia are presented here. A general picture can be outlined of basic architectural models and their evolutions, the building techniques, the architectural languages to be safeguarded and the main causes of deterioration. The work made it possible to set up further extensions of the survey to other settlements and to outline a first methodological approach for the sustainable recovery of the architectural heritage of these rural areas.

Key-words: Rural architecture, typological investigations, sustainable conservation, Tuscan Apennines

The abandoned settlements of the Santerno valley. Criticalities and resources

In Italy, the abandonment of rural towns is a broad and transversal phenomenon. Over the decades there has been an intensification of studies and projects aimed at the knowledge and recovery of this vast heritage.[1] However, this attention does not always lead to concrete recovery actions and many settlements remain in the state of ruin. Recovery actions are hampered by issues of a financial nature, sustainability, and the fragmentation of properties into countless heirs. In this dimension, their frequentation, if the access ways are still practicable, is limited to hiking and local authorities just secure the unsafe parts of the buildings. There is

[1] Studies on regional characters of rural architecture are many in Italy, developed over the last decades (Agostini 1999, Giliberti 2009, Piccinno 2006). Several recovery initiatives are leaded by different subjects: since 2001, the "Canova" association, together with the Polytechnic of Milan and Turin, has been involved in the recovery of abandoned rural villages in the Piedmontese Alps, promoting school construction sites.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

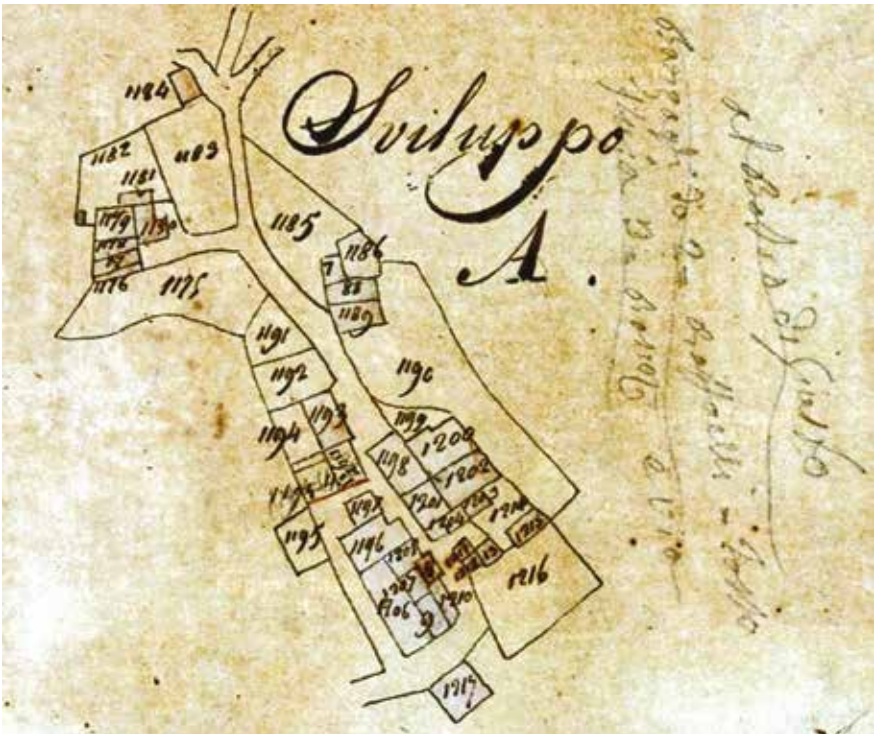

Fig. 2
Plan of Pratalecchia village in 1835 (Archivio di Stato di Firenze, Catasto Generale Toscano, Comunità di Firenzuola, Sezione U, foglio 6).

no lack of initiatives for the recovery (widespread hotels, farms, etc.), however, in the absence of clear protocols, incorrect interventions can compromise the conservation of the authentic (technological and cultural) characters of these architectures.

Objectives and methodologies

This investigation on the abandoned villages in the Tuscan Apennines, aims to draft guidelines for their rehabilitation. The methodological approach is based on the study of a representative sample, on which to calibrate adequate recognition, knowledge and diagnosis procedures. The sample chosen is the area of the so-called "Alpe Fiorentina", in the Firenzuola territory. Four villages have been selected (Piagnole, Castiglioncello, Brento Sanico and Pratalecchia) in the upper Santerno valley. The study is divided into multi-scale investigations, aimed at identifying characters of cultural testimony (recognizing), technological and formal characteristics (knowledge), physical and cultural damage and risks (diagnosis). The first phase, addressed to the documentary sources,

made it possible to trace a preliminary historical evolutionary line of these settlements, which was followed by the field-investigation phase for their material knowledge. Through filing, surveys and reading of the remains (typology and stratigraphy), data on architecture, materials, construction techniques and decay processes were collected.

Firenzuola and its villages

The upper Santerno valley (with its main tributaries, Diaterna and Rovigo) is one of the natural historical links between Tuscany and Romagna (Fig. 1). Its settlement system intensified between the 12th and 14th centuries, under the dominion of the Ubaldini family who built several castles to guard the only ridge road following the river. The sequence of fortified structures included the ancient castle on Santerno near Firenzuola, the one on Monte Coloreta, the one on Monte Caprile, the one in Piagnole on the Diaterna and continued towards Imola, including Tirli and Castiglioncello.[2] The strategic importance of this territory led to a clash between the Ubaldini family and Florence, which reached its peak with the Florentine foundation of Firenzuola in 1332 and ended with the defeat of the Ubaldini (1373) who sold their castles one after another, to the Florentines.[3] In the following centuries the medieval settlement system was reconfirmed and supplemented by new installations linked to the main economic activities of the valley. Between the 16th and 17th centuries, the presence of mills along the rivers increased, while on the heights inhabited centers developed for the management of pastures, chestnut groves and the production of coal.[4] The maximum expansion of rural settlements occurred in the 19th century, with the intensification of trade with Romagna. The presence of the rural areas of Mugello gradually decreased during the 20th century. The destruction of Firenzuola during the WW2 did not stop the gradual abandonment of the villages in favor of the larger towns, which reached its peak during the years of reconstruction.

The Village of Pratalecchia

The origins of Pratalecchia are not known. The oldest date, engraved on an architrave, shows the year 1814, but the age of the oldest domestic chestnut trees, estimated at 300 years, indicates a previous presence. Some documents indicate Pratalecchia as a "farm", which in

[2] An interesting study on the Ubaldini Family castels has been carried out by the "Ubaldini Project", collecting all the information coming from the literature sources (De Fraja 2014).
[3] The episode is narrated in the Giovanni Villani's "Nuova Cronica" (book XI, chap. CC), written between 1308 and 1348 (Villani, 2007).
[4] A wide description of Firenzuola, its history and its territory is done in the Geographic Dictionary of Tuscany (Repetti 1835, pp. 286-294).

Fig. 3
The village of Pratalecchia.

1835 had almost reached its current consistency (Fig. 2).[5] Oral testimonies attest to the presence of about 70-80 inhabitants and building activities in the early 1900s. The earthquakes of the late 19th century and especially the 1919 earthquake did not leave clear traces on the buildings.[6] Any damage could have triggered transformation and expansion initiatives (evident on numerous elevations) that went beyond simple repair. From the mid-1960s, with the disappearance of the last inhabitant, the frequentation of Pratalecchia was limited to the seasonal management of the chestnut grove. The village stands on the summit plateau (591 m asl) of a hill in the Monte Caprile group (812 m asl), with a south side that slopes towards the river and a very steep north-east side. The sloping clearings adjacent to the town were used for grazing and drained water to the gardens below. The south-facing slopes were arranged in terraced orchards. The chestnut groves occupy the range between 550 and 650 m asl.[7] The water supply was initially guaranteed from a

[5] A detailed plan of the village was drafted in the general land registry of Tuscany made in 19th century (Archivio di Stato di Firenze, Catasto Generale Toscano, Comunità di Firenzuola, Sezione U, foglio 6). The owners of the farm changed in 1835 (Gazzetta di Firenze, n. 94, 6 Agosto 1835).
[6] Data from "Archivio Storico Macrosismico Italiano (ASMI)" of the "Istituto Nazionale di Geofisica e Vulcanologia (INGV)".
[7] The surrounding woods also were arranged with retaining walls, mule tracks, clearings for charcoal piles.

source about 400 m north east of the town and from a well/cistern. Later some houses were equipped with masonry cisterns for rainwater. (Fig. 3)

The field survey

For the purposes of the survey, the village was divided into 12 blocks of buildings (Fig. 3). For each block a general form has been compiled with detailed sections on the individual construction units. It collects qualitative and quantitative data on the building and its parts: architectural, typological, technological characters, processes of decay. A detailed survey was carried out for each building to create the basis for thematic elaborations and for the planning of further steps of investigation (Fig. 4).

Morphology of the settlement and architectural features

The buildings of Pratalecchia are divided into houses and service buildings (Fig. 5). The correspondences with other villages confirm the circulation of architectural models, declined according to the site and specific needs. The standard house had two superimposed rooms (kitchen on the ground floor) connected by a wooden staircase. This scheme could vary

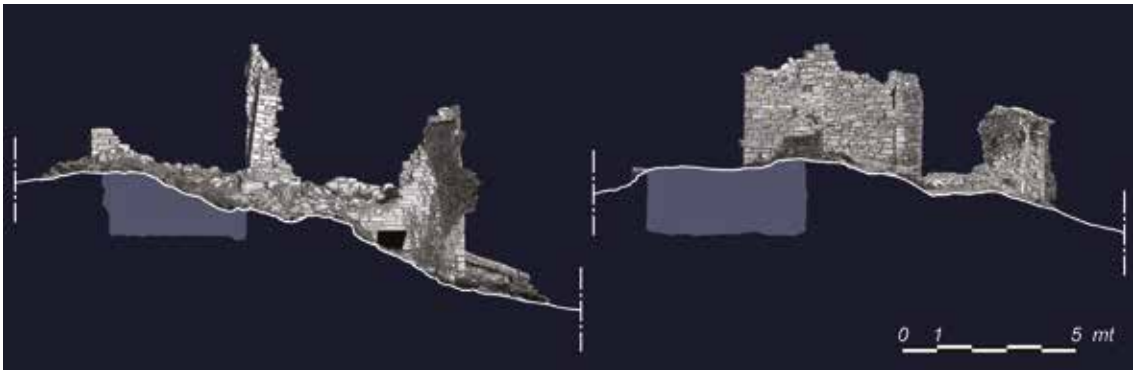

Fig. 4
Elevations of the remains of a house (block n. 12).

according to the position on a slope (additional basement room) or the aggregation of multiple buildings (moving accesses and connections between levels). The most common service buildings were stables and chestnut drying-houses. The stable consisted of a ground floor room for the animals and an upper level used as a barn. The drying-house consisted of two superimposed rooms with independent entrances: the combustion chamber on the ground floor; a trellis constituted the upper-level floor which housed the fruits to be dried. Other buildings were wood ovens, often with a compartment below the cooking chamber used as a winter shelter for small animals. The buildings were distributed along a main street: houses were placed along the south side, the service buildings on the opposite side.[8]

Fig. 5
Architectural models of the buildings (stable on the left, house aggregation on the right).

The role of building transformations

Evident traces of layered transformations on many buildings, frequently reworked as needs changed, confirm their evolutionary nature.[9] Stratigraphic investigations on the elevations allowed to identify phases and methods of transformation, tracing standard sequences and punctual solutions for modifying the original volumes (Fig. 6). The prevailing scheme envisaged two directions of aggregation: vertical (overlapping) and horizontal (side by side). The process could confirm the original functions (extension of a house or a stable) or cause a change of intended use (oven incorporated in a drying-house or drying-house enlarged in a home) (Fig. 7). Some technical devices flanked

[8] In Pratalecchia there was no church; for religious functions, people referred to the parish church of San Piero, 2 km to the west.
[9] This is a common phenomenon in rural architecture, wich can be recognized in many other italian areas (Guccini 2011).

these aggregations, such as the insertion of stone blocks connecting the walls. In some cases these elements were inserted on the edges of the buildings, for future extensions.

The architectural elements

In the study of rural architecture, the investigation of recurring architectural elements plays a crucial role. Being the realizations in which the cultural characteristics are more concentrated (technical and formal culture) their knowledge allows to identify the values to be safeguarded, especially in view of integration actions.[10] From another point of view, the typological investigation of the elements (openings, sinks, fireplaces) supports the understanding of the construction phases with the preparation of relative chronologies.[11]

In Pratalecchia, the investigation conducted on the openings led to the compilation of a preliminary catalog, which can be linked to those carried out in the neighboring villages (Figure 8). Several characters were taken into consideration for the typological survey: general morphology, shape of the jambs, lintels and window sill, materials, traces of tools. 10 types of windows have been identified. The first 3 are those with the highest frequency, relating to the major building activities. Although an extension of the survey to other villages is necessary, the preliminary results seem to show that the oldest models are characterized by the use

[10] For the methodology of typological investigation followed in this study see: Coppola 2018.
[11] An important tradition of studies in this field is carried out by the Ligurian scholars, heirs of the Tiziano Mannoni school (Mannoni 1976, Boato 2015).

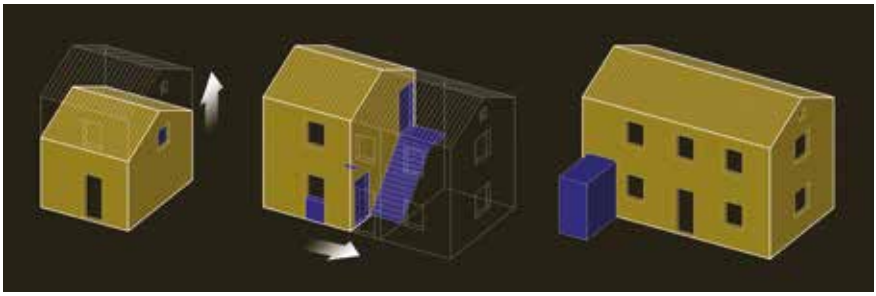

Fig. 6
Stratigraphic and typological investigations on the buildings.

Fig. 7
Sequence of the main transformations of the block n. 2, from a drying-house to a home.

of large, irregular blocks. In a subsequent phase, the blocks of the same size appear to be smoothed in a very accurate way with a strong presence of traces. The newer models are characterized by equally accurate but simpler and more standardized solutions.

Materials and building techniques

All the construction systems recorded are the combination of three materials: sandstone, earth mortar and chestnut wood (Figure 9). The stone comes from the Marnoso Arenacea formation, which has been exploited for centuries in this area for the extraction of the local lithotype, now marketed as "Firenzuola stone". The centuries-old mining activity has favored the development of a consolidated local technical culture with the spread of the figures of stonemasons and a wide range of working tools. The use of this stone varies according to the outcrops. The major blocks, intended for corners, jambs, architraves and sinks, underwent a more careful selection and are rich in working traces. The

recorded traces belong to tools such as pickaxe, hammer, flat and toothed axe, flat and pointed chisel, used in a versatile way (roughing, regularization, flattening), with different finishing patterns (straight, oblique or herringbone).[12] The blocks of the walls were split from the layers of rock with a thickness of a few tens of centimeters. The natural cleavage planes favored the detachment of blocks along regular (upper and lower) surfaces. This also made it possible to obtain slabs for the floors and roofs. Bricks are absent: their use is limited to the last phases of attendance, for punctual repairs. The total absence of limestone formations has influenced the production of mortars, with the use of a clayey earth binder and an aggregate obtained from the fragmentation of the sandstone. Chestnut wood was used for the beams of floors and roofs and for the internal architraves of the openings.

The construction systems

The construction systems were analyzed on the basis of four categories: 1) vertical elements: foundations and masonry; 2) horizontal elements: floors, roofs and vaults; 3) elements of discontinuity of the masonry: openings, arches and corner solutions; 4) other architectural elements and recurring devices (ovens, fireplaces, etc.). The identification of standard construction procedures, for each of these groups, made it possible to isolate, through stratigraphic investigations, specific anomalies due to subsequent modifications. In most cases the vertical wall structures rest directly on the rocky substrate, suitably shaped. All the walls have a conglomerate core made of earth and stone scraps. There are three main types of masonry works, each with its own variants, determined by the level of accuracy and size of the elements. The best one has regularized blocks, arranged on basically horizontal rows with frequent splitting and a limited use of fragments (Figure 9). The corners are in large square blocks well clamped to the walls. The joints have a thickness between 1 and 4 cm.[13] There are sporadic horizontals which, however, rarely run along the entire wall. In this type of wall there are rare diatonic elements for the connection of the two curtains. The second masonry type is less accurate, consisting of irregular stones, slabs and fragments, with abundant mortar, to reach horizontal rows. In the third type, stone slabs prevails in dense, split horizontal rows. The floors consist of one or two main beams (about 20 x 30 cm) embedded in the walls, on which 10-12 cm side joists rest. The space between joists (about 50 cm) was covered with large sandstone slabs (6-7 cm thick), which formed the flooring of the upper level. The roofs followed a similar procedure with a ridge beam on which secondary beams and joists rested, all embedded in the perimeter walls, without reducing the horizontal thrust.

[12] A fundamental reference for the study of the traces of working tools is the Bessac's work (Bessac 1986).
[13] Masonry works were analyzed according to the methotology of Fiengo 2003.

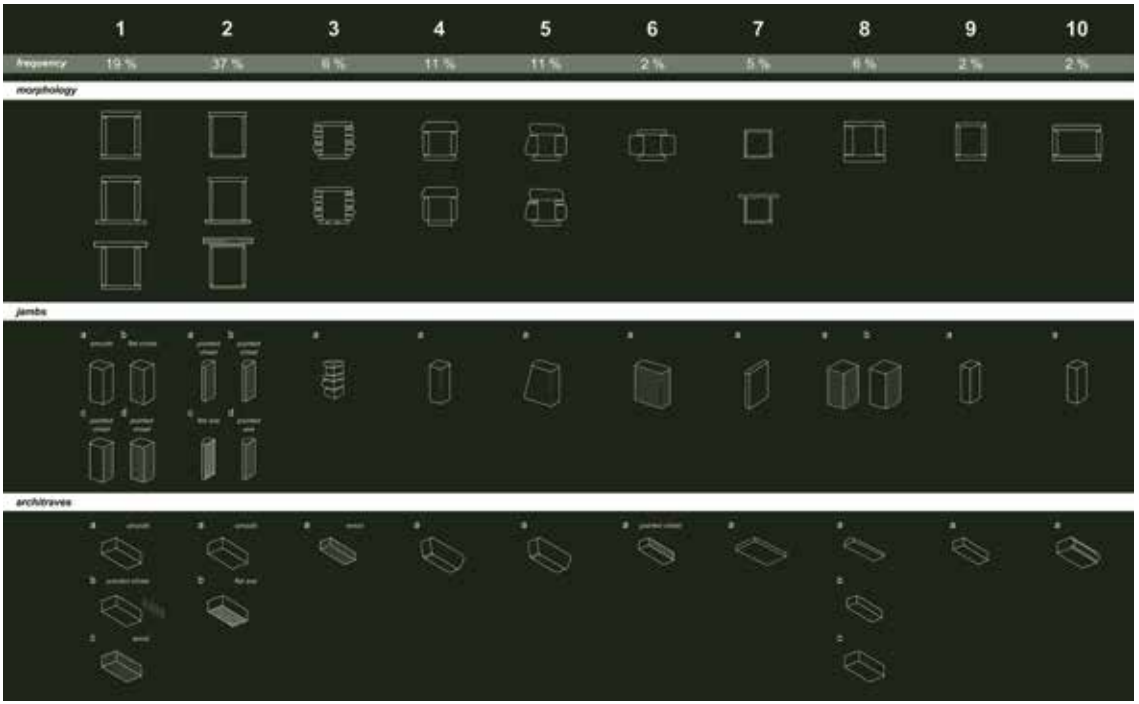

Fig. 8
Typological catalogue of the windows.

Fig. 9
Earthen binder mortar (on the left), oblique traces left by a pointed chisel on a jamb (center), sample of a type 1 masonry (on the right).

The degradation processes. Dynamics and causes

All the buildings in Pratalecchia are in a state of ruin, except two still in use. The weathering of the materials is diversified: the wooden elements undergo deformations and rot; the stone shows widespread phenomena of exfoliation and erosion. However, the main intrinsic criticality of these artifacts is the vulnerability of the earth mortars. Over the years, exposure to atmospheric agents has led to the collapse of roofs and floors. The wall structures undergo water infiltrations on the top which, combined with dry-wet cycles and thermoclasticism due to solar radiation, dissolve the mortars.[14] The action of weed vegetation on the exposed walls sections is significant. In addition to herbaceous plants (*Parietaria Officinalis*), there is a strong presence of shrubs (*Rubus Ulmifolius*, *Clematis Vitalba*, *Acer monspessulanum*, *Robinia Pseudoacacia*) whose roots penetrate the walls.[15] The prevailing strong winds, in addition to the erosion of stone materials, can

[14] A reference study is the manual of Luigi Marino for the identification of pathologies in archaeological areas and ruined buildings (Marino 2016).
[15] A useful contribution to the knowledge of the risk caused by the vascular plants is that of M. A. Signorini who

compromise the tightness of the most unstable walls (Fig. 10). Other degenerative mechanisms are due to structural instability. The most vulnerable parts are the partition walls released at the sides and at the top, due to the collapse of floors, roofs or flues inside the thickness of the wall. The stone lintels are frequently damaged and the bending of the wooden ones causes the collapse of the masonry above. The thrust of the ground and the action of roots cause deformations that can lead to the expulsion of material.[16]

Conclusions and perspectives

The results of the survey offer a fairly clear preliminary knowledge picture that can guide future research developments. Among the short-term objectives there are in-depth studies (instrumental and analytical) on the stability of the wall structures, starting with geophysical investigations to assess the presence of internal voids. The characterization of stone and mortar by lab tests will facilitate the interpretation of decay processes and the evaluation of intervention strategies. Risk assessment models will be developed for the whole complex, which take into account the main factors involved (vulnerability, exposure, speed of phenomena, etc.), to establish hierarchies of possible conservation actions.[17] In the long term, the research aims at defining guidelines for sustainable recovery on two levels: that of the definition of an adequate housing model and that of direct interventions on the buildings. Since its origins, the village of Pratalecchia has based its existence on the balance between anthropogenic

classified them by the danger of their roots for the masonry structures. (Caneva 2007, pp. 87-96).

[16] The study of the construction phases can be useful for evaluating the structural efficiency of buildings and understanding the dynamics of instability. In fact, the modifications of a building model may have introduced elements of discontinuity or weakening of the wall structures.

[17] This important phase of the further investigations will be developed according to the approach proposed by the Manual of Risk Assessment of Cultural Heritage of ICCROM (Michalski 2016).

Fig. 10
Different degeneration processes.

activities and landscape maintenance with minimal environmental impact. This relationship must be the foundation of any concrete hypothesis of sustainable recovery. Starting from the management of the chestnut groves, an agricultural dimension integrated with the biodiversity of the area could be the starting point of a stable presence in which the needs emerging from the recent post-pandemic scenarios can also converge. This could be accompanied by periodic attendance with the provision of accommodation facilities to support hiking and study activities. In a sustainable perspective of reintegration, it will be essential to stimulate paths of re-appropriation of collective memory and contact with the territory with the local community. Conservation interventions and new architectural insertions must be conceived following two directions: cultural attitudes to safeguard the witness values that have emerged (formal, technical, spatial, etc.); technical attitudes (conservation and consolidation of remains, seismic and energy improvement). In this dimension, the great potential of the site's alternative energy resources (sun, wind) can make a decisive contribution.

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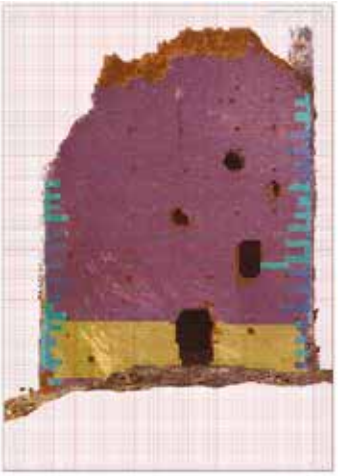

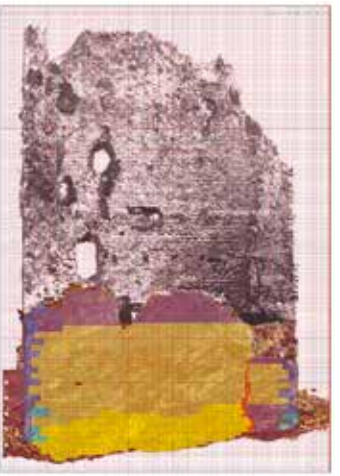

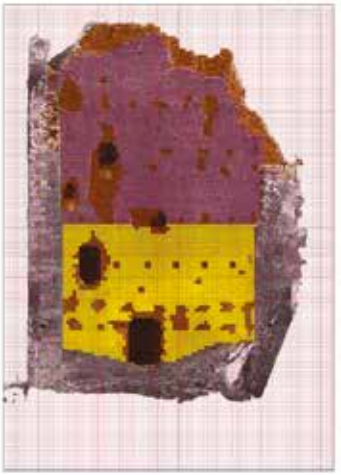

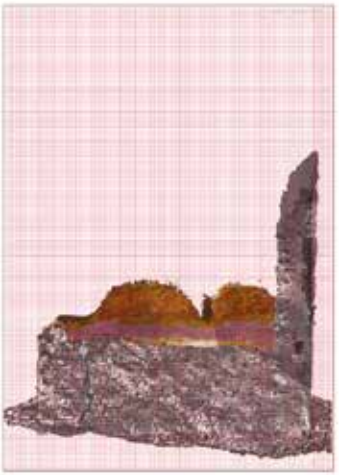

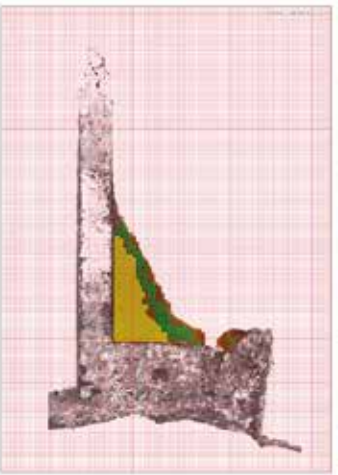

THE SAFEGUARD OF BUILT HERITAGE IN ARCHEOLOGICAL SITES, AN INTERDISCIPLINARY APPROACH BASED ON LIGHT-WEIGHT UAV PHOTOGRAMMETRY AND TERRESTRIAL LASER SCANNING SURVEY: THE CASE STUDY OF MONTE LUCIO

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Università degli studi di Bologna-Italia

Elevations-characterization analysis of "Monte Lucio" tower, from top left: east elevation; north elevation; west elevation; south elevation; internal east elevation; north internal elevation; internal west elevation; internal south elevation – (Graphic Elaboration, 2018 © Paolo Faccioli).

This paper introduces a well-defined working pipeline oriented to a multidisciplinary approach to analyze the structural behaviors of the Archeological Heritage through complementary and integrated studies. The geometrical and deterioration data pertaining to a medieval tower in "Monte Lucio" (Reggio Emilia, Italy) were joined in an accurate 3D model to be used for structural analysis, starting from the complementary use of a terrestrial laser scanning (TLS) with UAV air photogrammetry. Meanwhile, an interdisciplinary collaboration between different professional figures such as archeologists and chemists was established to get information relating to masonry stratigraphy and mortar typology. This allowed the material characterization fine-setting for parameters then embedded into structural models, usually the most complex operation in historical buildings. This led to classify the different brick typologies and the elevations' characteristics in a 10x10 cm pixel matrix, identifying each slice uniquely by using different colors. The matrix was then imported in MATLAB, assigning coordinates and mechanical characteristics to each pixel, according to material typology. Finally, the model was imported in Abaqus Unified Fea to perform "Pushover analysis" and to calculate the distribution of horizontal forces to evaluate possible prevention measures to be taken. In conclusion, through the adoption of different combined digital survey technologies and multidisciplinary data sharing, the proposed workflow proved to be efficient in the case study presented.

Keywords: Cultural Heritage, Terrestrial Laser Scanning, UAV, Aerial Photogrammetry, Archaeological Site

Introduction

State of the art

Restoration of Cultural Heritage is a complex theme, especially when it affects archeological ruins. It requires close collaboration among various professional figures in order to get a complete and reality-based cognitive framework about the examined objects and to develop analysis models that respond to the actual building's behavior (Dall'Asta et al., 2018). Historical masonry ruins are challenging because of many factors: only a few fragmented and disconnected structural elements often remain, geometries of buildings are usually irregular, a careful historical analysis is essential to determine construction phases and related vulnerabilities, mechanical properties of deteriorated materials are not known, and in-depth studies

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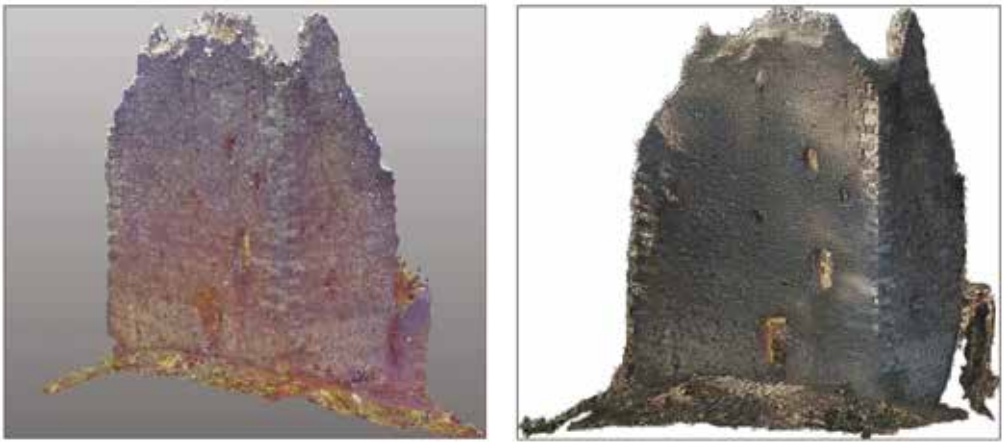
The tower of "Monte Lucio" ground and aerial pictures. – (Photos, 2018 © Davide Prati and Simone Garagnani).

are necessary to estimate them. Due to these reasons, an accurate but simple analysis is essential to understand all the possible variations and uncertainties of the parameters that describe the problem (Lourenço and Roque, 2006).

There are numerous studies in the field of vulnerability analysis of historical buildings that use innovative tools, software, and procedures (Yekrangnia and Mobarake, 2015; Valluzzi, 2006; Lourenço and Roque, 2006; Betti and Vignoli 2011; Galassi et al., 2019), but in most of them, the building is interpreted as a unique case that needs a specific interdisciplinary study.

The progressive development and dissemination of digital survey techniques permitted to know in-depth historical buildings identifying anomalies, organization, and state of deterioration of their elements, providing very accurate data and obtaining results that correspond as much as possible to the effective structural behavior (Fregonese et al., 2013; Prati et al., 2019). The use of photogrammetry and terrestrial laser scanning has been extensively investigated over the years (Koch et al., 1998; Bucksch et al. 2007; Pfeifer et al., 2007; etc.). Recently, the spread of UAVs (Unmanned Aerial Vehicles) proved to be effective in the field of photogrammetry (Murtiyoso et al., 2017), so several studies explored the potentialities of its complementary use with a terrestrial laser scanner (Pueschel et al., 2008).

Comparison between the two point clouds: realized in Faro Scene from data acquired by the terrestrial laser scanner, (on the left); Created in Agisoft Metashape using the acquired aerial images (on the right) – (Graphic Elaboration, 2018 © Paolo Faccioli).

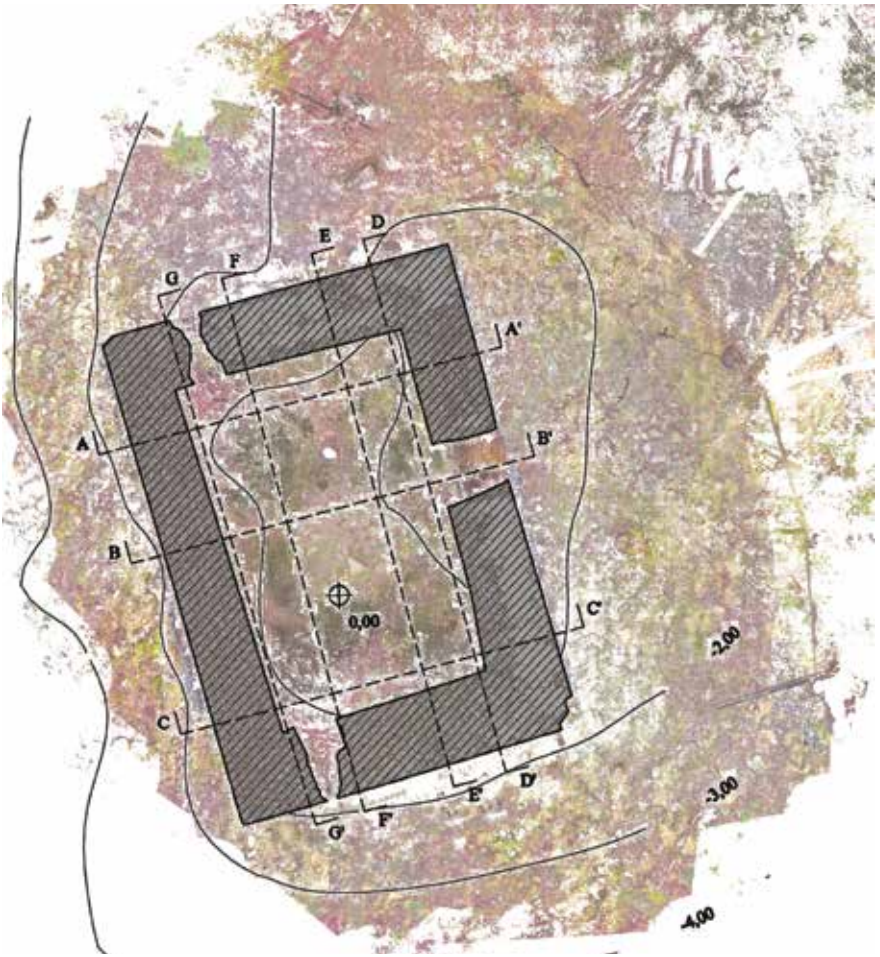


Historical investigations and tests on materials are also fundamental to gain a detailed knowledge of archeological sites. Investigations allow reconstructing the evolution of the building phases to make qualitative hypotheses on the organization of materials in stratigraphies while tests give quantitative information about the mechanical properties of materials, which can be integrated with geological analyses.

The Case Study: The Tower of "*Monte Lucio*"

The case study presented in this work consists of a medieval tower located on the top of "*Monte Lucio*", one of the four hills between the Po Valley and the Apennines, south of Quattro Castella in the province of Reggio Emilia, Italy. Thanks to their strategic position, these hills are characterized by a significant amount of medieval buildings, such as rural houses, towers, villages, and fortifications, many of which are in a state of ruin.

The scarce archival sources on "*Monte Lucio*" mention a first village over the hill, probably devoted to military function, around the end of the 13th century (Salimbene, 1882; Bandieri, 2017). The original construction of the tower might be dated back to that period and it was probably inspired by the castle or of the medieval tower-house, a typological multi-level dwelling that was commonly used to control the area since the 12th century militarily (Fabbri F., 1960). In the following centuries, different owners followed one another to manage the fortress of "*Monte Lucio*", changing its role from a military outpost to an agricultural center, until it was restored in 1497. However, it seems that the site fell into disuse between the 15th and the 16th century, slowly reaching the current state of ruin (Bandieri, 2013). Since 2011, an archeological two years long excavation project has been carried on to

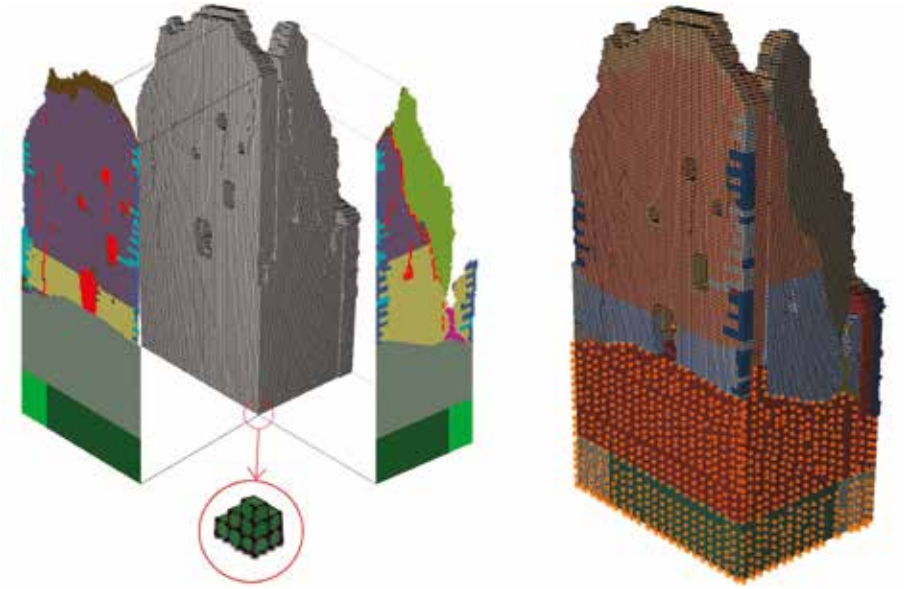


The tower of "Monte Lucio" ground and aerial pictures. – (Photos, 2018 © Davide Prati and Simone Garagnani).

Creation of the Matlab model starting from the elevations-characterization analysis (on the left) Finite element model in which the different materials and the ground and foundation bonds are applied (on the right) – (Graphic Elaboration, 2018 © Paolo Faccioli).

provide important information about the historical site, encouraging different research activities (Augenti et al., 2012).

The tower is located on the highest point of the area, about 309 meters above the sea level, in a predominant position over the other ruined buildings. It has quite a small rectangular plan, about 5.8 x 8.6 meters, and a maximum height of about 13 meters. Nevertheless, the original construction was likely 16 meters high (Ballardini, 2016). The building is currently in critical condition: large portions of masonry from all four facades, the roof, and the internal floors fell to the ground. In addition, an evident material



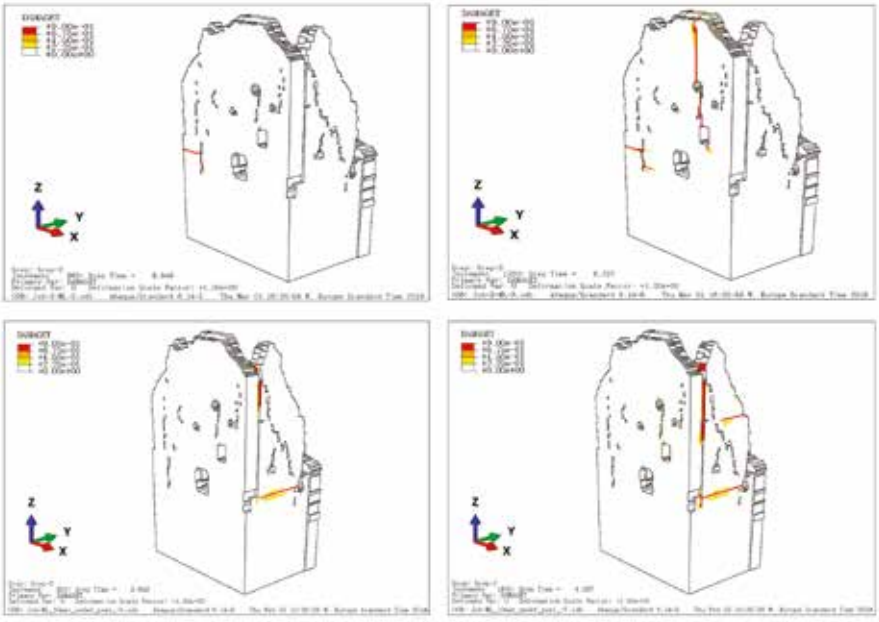
detachment is shown on the north and south facades, walls display a series of vertical cracks, and one of them is strongly inclined towards the outside. Most of these problems are caused by the position near the hill slopes, where the ground is gradually collapsing down to the valley.

The Equipment: Terrestrial phase-shift laser Scanning and UAV air photogrammetry

The difficulties in accessing the tower by land have led to the complementary use of terrestrial laser scanner with UAV air photogrammetry:

A "Faro Cam2 Focus 3D 150" laser scanner was used for the terrestrial survey. The contained size (24 cm x 20 cm x 10 cm) and the outstanding portability of this tool (5 hours of autonomy and 5 kg of weight) allowed surveying the tower quickly, despite the difficulty of operating in this area. The instrument offers accurate geometric data (linear distance error of ± 2 mm for a measure among object and scanner in a range between 10 m and 25) with the possibility of obtaining the detailed coloring of the point cloud.

A DJI Phantom 4 was used to carry out the aerial photogrammetry. This is a small drone (29,0 x 29,0 x 18,0 cm), 1380g in weight (battery and propellers included) with a maximum load of 300g, enough to fit a GoPro Hero 5 action camera with digital gimbal stabilization. Although this camera is characterized by an ultrawide field of view (FOV) considered in lens



Pushover analysis in Abaqus Unified Fea: upper, the analysis carried out in the x-direction; below, the analysis carried out in the y-direction – (Graphic Elaboration, 2018 © Paolo Faccioli).

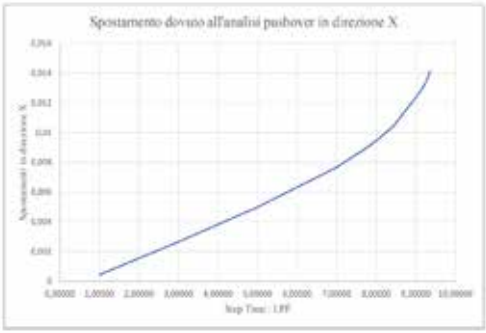
calibration, the 4K highest resolution ensured an ideal outcome by overlapping the pictures of at least 50%, with a proper resolution for photogrammetric purposes.

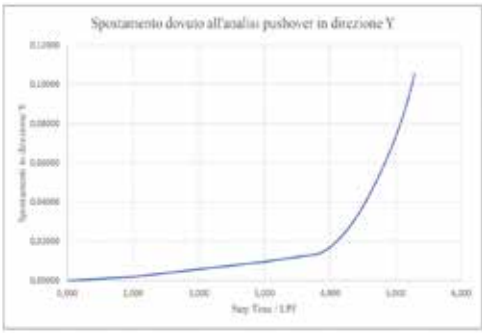
The workflow

This study illustrates an interdisciplinary workflow for vulnerability and safety analysis of ruins in archaeological sites, based on the collaboration between different figure to obtain the following complementary studies:
The Survey of the Ruins (Planning, acquisition, modeling);
Archeological Study, Historical Investigation and Material Analysis;
Structural Modelling and Analysis.

The Data Collection: The Ruin Survey

The main obstacles to survey operations were the remote location of the hilltop and the presence of invasive shrubs. Consequently, the survey was carried out at the end of autumn to minimize the vegetation interference.
The complementary use of terrestrial phase-shift laser scanning with UAV air photogrammetry has permitted to obtain a highly detailed 3D model: the terrestrial laser scanner, at





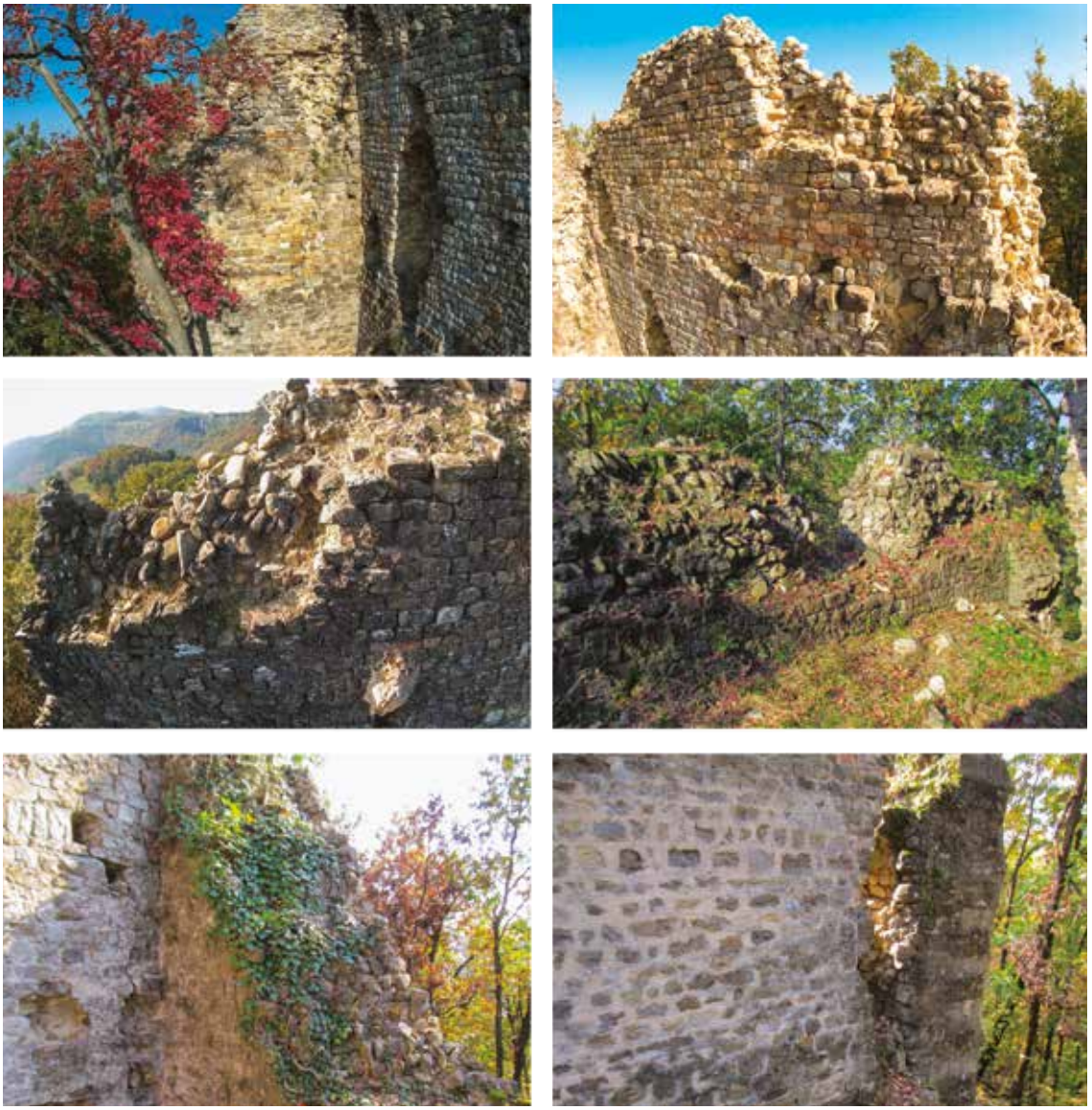
a close distance from the tower, offers extremely accurate geometrical data of the basement, becoming less accurate on the upper parts; on the opposite, the UAV air photogrammetry provides highly defined 3D model of the top of the tower. In order to minimize accuracy gaps in point clouds authored with different techniques, some ground control points were measured to evaluate their mutual distances and to set their coordinates for the aerial photogrammetric survey. Thus, alignment and registration of the upper point clouds and the lower ones were successful, with a satisfactory RMS value for each aligned scan.

This survey approach has allowed a deep understanding of the construction concerning wall thickness and masonry stratigraphy. It has also highlighted the anomalies and irregularities in element laying and allowed locating openings as well as possible. The final data merging of both the point clouds in a 3D model has been employed to produce the façade elevations as the structural analysis starting point.

The Archeological Study, Historical Investigation, and Material Analysis

The stratigraphical analysis of "*Monte Lucio*" was key to recreate the original aspect of the building. Probably the tower contained three wooden ceilings, and its height allowed the visual contact with the surrounding settlements of "*Monte Zane*" and "*Bianello*". The walls, which taper towards, are characterized by the presence of numerous putlog holes, placed at approximately one meter between one row and the other. The current access of the tower is not the original one that probably was located in the south or west wall of the building at a higher place through a drawbridge.

Two main masonry typologies are present in the tower of "*Monte Lucio*". The first, most common, is contemporary to the settlement on the hill, according to literature sources, during the 13th century. The brickwork consists of local sandstone cobblestone, not manufactured or only splitting, laid on horizontal mortar beds of variable size. The corner quoins,



The current wall condition of the tower of "Monte Lucio" – (Pictures, 2018 © Davide Prati & Simone Garagnani).

instead, are made up of sizeable squared sandstone elements hewn by expert stonemasons. The core of rubble masonry is characterized using similar sandstone in regular courses, unlinked to the outer shell. In the south wall, affected by notable collapses in the 14th century, the second masonry typology is present, made up of waste material from the previous collapse alternated with new bricks, arranged chaotically (Augenti, 2012).

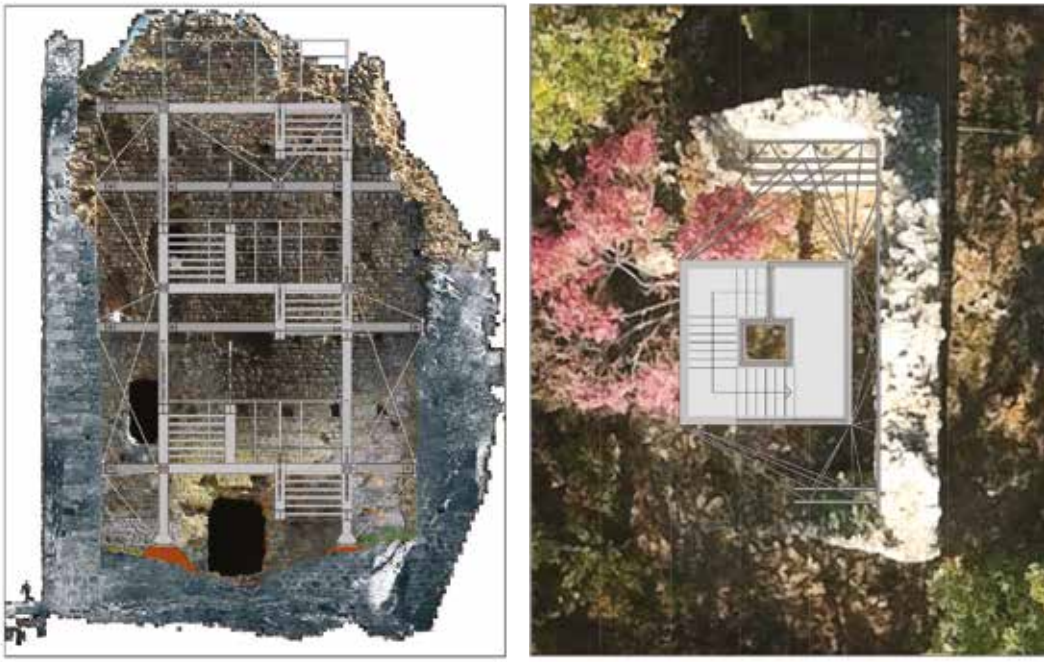
Following the stratigraphic analysis, five mortar samples were collected. These samples were taken to carry out the chemical and petrographic analysis from the corresponding different stratigraphic units of the tower. The samples collected from the north wall, reveal an unusual feature in medieval times, the use of hydraulic lime mortar, obtained from the calcination of local limestone with high clay percentage. The mortar samples taken from the south wall, in which the second masonry typology of the 14th century is present. The courses are bounded with aerial lime-based mortar of medium-low quality, produced with local raw materials and traditional methods. The third mortar typology has been identified as a modern product of the industrial age between the XIX and the XX century, consisting mainly of a mixture of lime and cement, probably used to fill the collapse of some sandstone elements (Bandieri, 2016).

Structural Modelling and Analysis

The external and internal elevations of the tower were produced from the 3D TLS survey. The masonry was divided within a 10 x 10 cm grid, based on the different brickwork, on the typology of elements, and to the state of conservation, using different colors. Therefore, the masonry parts, preserved in the best possible way with limestone elements and the abundant presence of hydraulic mortar, were diversified from the wall portions in which the mortar is less used. Afterward, the squared sandstone quoins bounded as orthogonal devices with heading and stretching stones. were diversified from those significantly damaged and less resistant. Then, the portions present in the north and south facades were detected, where fallen materials filled the large cracks caused by the beginning of the west wall overturning.

Another color was linked with the masonry portion of the north facade rebuilt after the collapse, characterized by a mixed composition of recovery-collapsed materials and bricks, bounded by a not particularly resistant mortar. Finally, the significant cracks, the partial collapses, and the missing stone elements were detected along with the presence of putlog holes and the masonry invaded by vegetation.

The matrix was further simplified to use the elevations in structural software, removing the background photo of the tower and approximating the Intermediate situations to worse conditions. Accordingly, using MATLAB, the elevation images were transformed in a matrix, in



Design of the new steel truss-tower. Section view (on the left); **Top view** (on the right) – (Graphic Elaboration, 2018 © Paolo Faccioli).

which each element of 10cm x 10cm side was reduced to a point with geometric coordinates and mechanical characteristics corresponding to the type of material to which it refers. Each elevation was then inserted in a three-dimensional space, obtaining the walls thicknesses by reproducing the images in succession along the z-axis, till reaching the opposite façade. The software automatically creates the model in CAE (Computer-Aided Engineering) format so that it can be used in Abaqus Unified FEA (Finite Element Analysis) in order to carry out the structural analysis.

Afterward, the ground and foundation bonds are applied in the finite element model along with the loads to carry out the analysis: a linear analysis, both static and dynamic, was performed to observe the building response to seismic actions and to verify the model and data correctness. Subsequently, the non-linear static analysis was carried out applying an inverse triangular profile load, first in the X direction than in the Y direction, increasing the horizontal acceleration from 0 to 10 m/s2, a very high value in order to provide an amplified view of structural behavior.

By confirming the hypothesis on the building structure, the analysis has highlighted the north and east walls possible overturning risk toward the outside of the tower, suggested

by the crack formation along the weakest portions of masonry (already damaged portions or near the openings). The presence of overturning mechanisms has been further confirmed using the linear kinematic analysis in accordance with Italian law in the field of structural safety (Norme Tecniche delle Costruzioni, 2018), which demonstrated the need to insert tie rods in a hypothetical restoration project in order to guarantee seismic safety.

The enhancement and renovation project proposal

The presented analysis shows that the tower's most significant problem consists of the possible overturning of the north and east walls toward the outside of the building. Moreover, the timber ceilings are completely missing inside the fortress, and masonry walls are, in general, not attached to the other ones. Another critical issue is the degradation on top of the walls, where some stones could involve dangerous situations in case of strong wind or seismic events.

In order to limit the danger caused by the top-stones possible collapsing, the protection on top of the walls should be realized by using a thin layer of fiber-reinforced mortar, reinforced with a fine stainless-steel net, to give tensile strength and to improve the connection between the walls at the top.

The construction of a stainless-steel truss-tower inside the historic building is considered to solve the wall overturning (Jurina, 1996). The new structure, with a square base of side 3.5 meters and a maximum height of 10.5 meters, contributes to stability transferring the loads that were previously supported only by the historic building. A 1-meter gap is left between the two structures, the masonry one and the steel one, to insert four bond-beams and connect them to the towers. These elements improve the joining between the walls, their collaboration, and the entire building's structural behavior in case of seismic loads. The bond-beams are connected to the masonry through many anchor plates placed 10-15 centimeters inside the putlog holes, so that the anchor plates of the tie rods are not visible on the external facades (Jurina,1996). The rigid tie rods connecting the two structures absorb the horizontal actions both in the external and internal direction of the building. The anchor's insertion in the masonry involves the hydraulic mortar injection, with a composition similar to the original one, which also improves the overall masonry strength.

Inside the steel structure, the realization of a metallic staircase allows reaching all three different floors that would be used both for studies and maintenance interventions. The stair furthermore offers the possibility to the public to visit the historical tower and enjoy a panoramic view of the surrounding area. Thanks to the use of steel elements, the whole intervention is almost entirely reversible and modifiable.

Conclusions

This paper illustrated an integrated multidisciplinary approach to analyze the structural behaviors of the Archeological Heritage, involving engineers, architects, archaeologists, historians, and chemists with the aim to achieve a full knowledge of the studied ruin through complementary studies concerning of geometrical shapes, building evolution, masonry and stone stratigraphy, characterization of the materials properties.

The proposed methodology was applied to a complex case study that required an exhaustive research; the medieval tower located in the archaeological site of "*Monte Lucio*". The complementary use of terrestrial phase-shift laser scanning with UAV air photogrammetry allowed to obtain accurate dimensional data, including the detailed information on the inaccessible tower top; An exhaustive stratigraphic analysis was carried out through laboratory tests on the mortar that made it possible to date the different construction phases of the tower and to obtain the characterization of the properties of the materials. All this information was transformed in MATLAB and was used in *Abaqus Unified Fea* to perform structural analysis in order to evaluate possible intervention strategies to be taken in the enhancement and renovation project proposal.

In conclusion, the exposed approach introduces a well-defined working pipeline oriented to a tight collaboration between different disciplines to produce digital models to perform in-depth vulnerability analysis of ruins. The relative cheapness of equipment and the reduced time spent in surveys and elaborations guaranteed by the use of well-integrated software suggest that the presented multidisciplinary approach represents an efficient approach in damage prevention for archaeological sites and enhancement strategies.

Acknowledgments

The authors are grateful to Paolo Faccioli for his work and his renovation project proposal on the tower of "*Monte Lucio*" produced during his Master thesis, and to Professor Giovanni Castellazzi for his support during the structural analysis.

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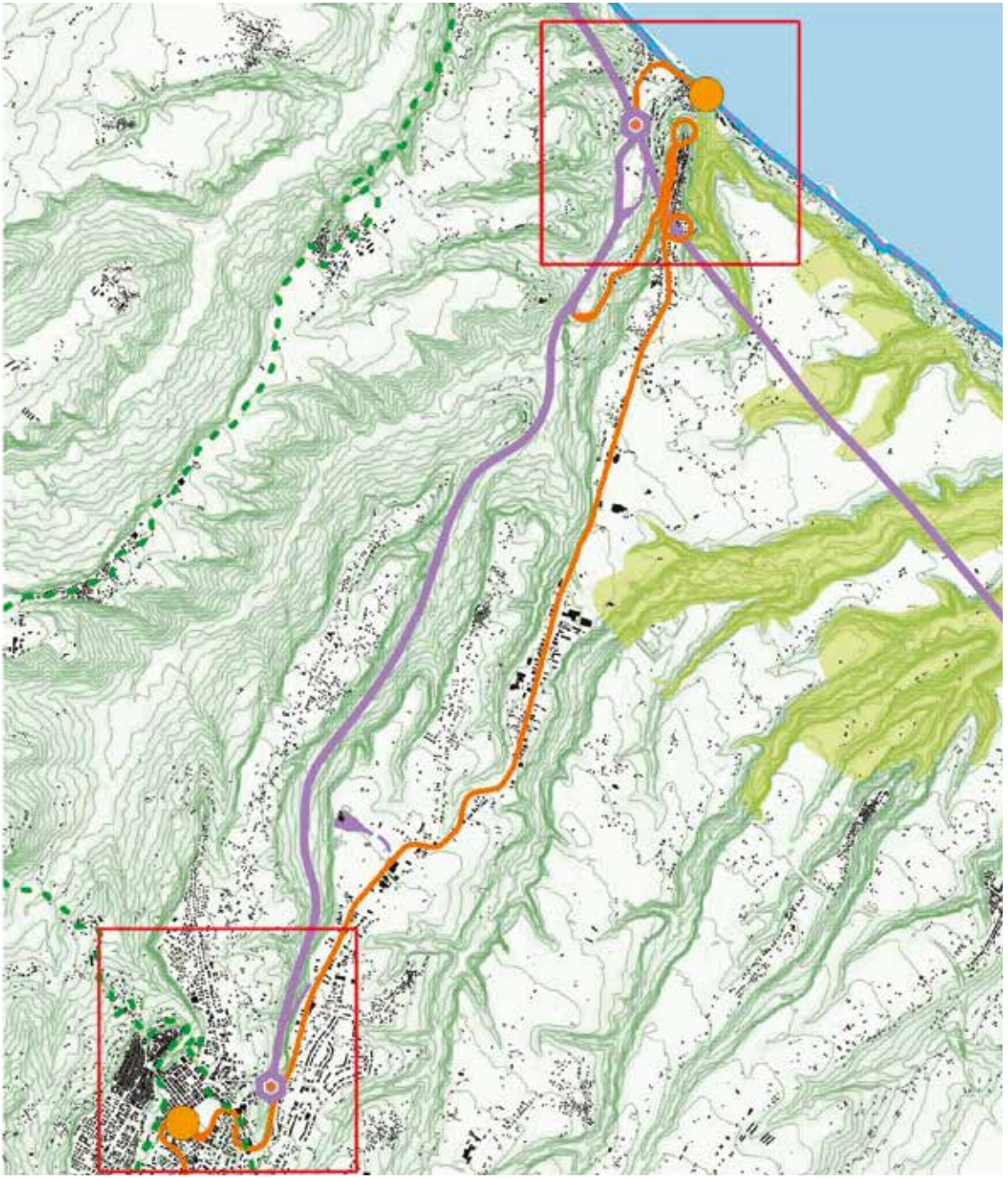

SLOW MOBILITY AS A CONNECTION DRIVER FOR FRAGILE TERRITORIES BETWEEN COASTLINE AND INNER AREAS

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Politecnico di Milano-Italia

Chiara Ravagnan, Giulia Bevilacqua
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Mapping of slow connection between Lanciano and San Vito Marina. In purple active network and stations, in orange the dismissed railway. In light blue the Ciclabile Costa dei Trabucchi. Dashed green lines are Tratturi tracks. (Author D. D'Uva).

The right to a sustainable and inclusive mobility represents today a key issue of the debate on fragile territories, in a perspective of territorial rebalancing, environmental regeneration and socio-economic resilience, starting from a growing awareness of the complex links between depopulation, abandonment and divestment of the infrastructural heritage as well as the effects of the car-centric mobility model.
In particular, the connections of the inner areas between the smaller centres involved in depopulation and the main nodes of the territories on the coast are possible today only with private vehicles. Furthermore, sectoral policies relating to large infrastructures have often increased the gap between "fast territories" and "slow territories", without providing effective solutions to increase the quality of life of the inhabitants of the most fragile territories.
This research activity is aimed at deepening this issue, facing, as a study area, territories with particular morphological and structural conditions, pointing out how the instances of territorial rebalancing, environmental regeneration and socio-economic resilience of fragile territories can find a possible solution in the planning of an intermodal and sustainable mobility system. In particular, in these conditions, slow mobility is characterized by high potential and, at the same time, criticalities, such as the potential system that links the Costa dei Trabucchi in Abruzzo to the inner areas of the Basso Sagro. The rugged feature and, at the same time the great landscape and cultural value of this territory have fostered the use of innovative tools for the analysis of connection networks. Cycling is an archetype of a "resilience path", which arises from the phenomena of abandonment of the railway networks, reversing the vicious circle of abandonment. The slow routes become essential drivers of accessibility and sustainability if designed starting from the evaluation of slopes and travel times between the hill towns and the coast, both for daily transport and for tourist travel, which make the flows change rapidly and significantly with seasonality.
San Vito Chietino and Lanciano nodes and the ridge that connects them have been studied integrating, in an interdisciplinary way, qualitative and quantitative-parametric methodologies. The integration of the approaches is indispensable for the evaluation of the complex system of relationships that cross the disused railway lines, with the related stations. This network can represent a possible development driver if it is able to effectively connect, through the reuse of the tracks of disused railways, the intermodal nodes of the new stations to the smaller centers, to the Via dei Trabucchi, to the networks that have connected the territory in the past, such as that of the Tratturi, whose main route runs along Lanciano and connected it to Crecchio, linked to the Cammino di San Giacomo. The slope that characterizes this territory is certainly an important aspect to be evaluated for the feasibility of the routes in this area, for which a three-dimensional NURBS model has been realized starting from geographical data. A combination of GIS and parametric design tools is applied to geographic data for in-depth network analysis. The expected results of the research and experimentation are related to the definition of guidelines for

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Fig. 1
The railway line and the Trabucchi Coastline from the historic centre of San Vito Chietino (ph. C. Amato).

a multi-scalar and intermodal mobility system, which involves different types of mobility in relation to the context, trying to enhance the latent resources in terms of territory and landscape and at the same time, addressing accessibility issues, to foster a reactivation in terms of new opportunities and liveability of these territories.

Keywords: connection, parametric analysis, railway, cycling, cultural heritage

From fragilities to regeneration, through territorial networks and research paths

In the last decade, Italy has led the debate and the experimentation focused on the theme of "inner areas" and territorial "fragilities" (AAVV, 2017), fostering new interdisciplinary

research paths, innovating the National political agenda, triggering a different use of National and European funds.

In this framework, the revitalization of small historic centers, affected by depopulation, socio-economic decline and abandonment of the built and infrastructural heritage, is a key issue to be addressed through a holistic vision, bearer of effective cognitive approaches and integrated regeneration strategies.

The research path and project experimentation illustrated in this contribution are in line with this vision aimed at keeping together the ranks of a possible mending due to that territorial capital consisting of material and immaterial networks that link the smaller centers to each other and to the most dynamic contexts.

This research activity is configured as the outcome of the convergence and coordination between two research paths: the project of the Department of Planning, Design and Technology of Architecture entitled *Resilience Paths. The relaunch and reuse of minor railways for the regeneration of fragile territories* financed by the Sapienza University of Rome and the project *Fragile Territories* held by the Department of Architecture and Urban Studies of the Politecnico di Milano.

In particular, this study focuses on the divested minor lines that connect the inner areas to the Mediterranean coast[1], investigating with an interdisciplinary approach the opportunities that emerge from a possible strengthening of the cycle/pedestrian system. The realization of greenways represents in fact, in fragile contexts, a scenario of sustainable development (Lille Declaration, 2000) and a proactive resilience strategy (Pike & al., 2010). This line of intervention arises from environmental, economic and cultural demands and is supported by innovative methodologies that ensure technical and economic feasibility, in consistence with new sources of financing.

This contribution therefore intends to investigate the main fragilities and resources of the Abruzzo territory between the Adriatic coast and the inner areas of Basso Sangro in the Province of Chieti, along the Sangritana Adriatic Railway (FAS), which is affected by the phenomena of divestment strongly interrelated with the phenomena of depopulation and economic decline. Starting from the awareness of these fragilities, the second part proposes an intervention methodology for the reconfiguration of the infrastructural system in a sustainable perspective, paying attention to the feasibility of a cycle path between San Vito Marina and Lanciano, within the framework of an intermodal mobility system. This experimentation opens the final reflection on possible "resilience paths", integrated

[1] This reflection is also part of the debate that arises from the International Research Network Medways- Le Vie del Mediterraneo, promoted by the University of Trento and the Accademia dei Lincei.

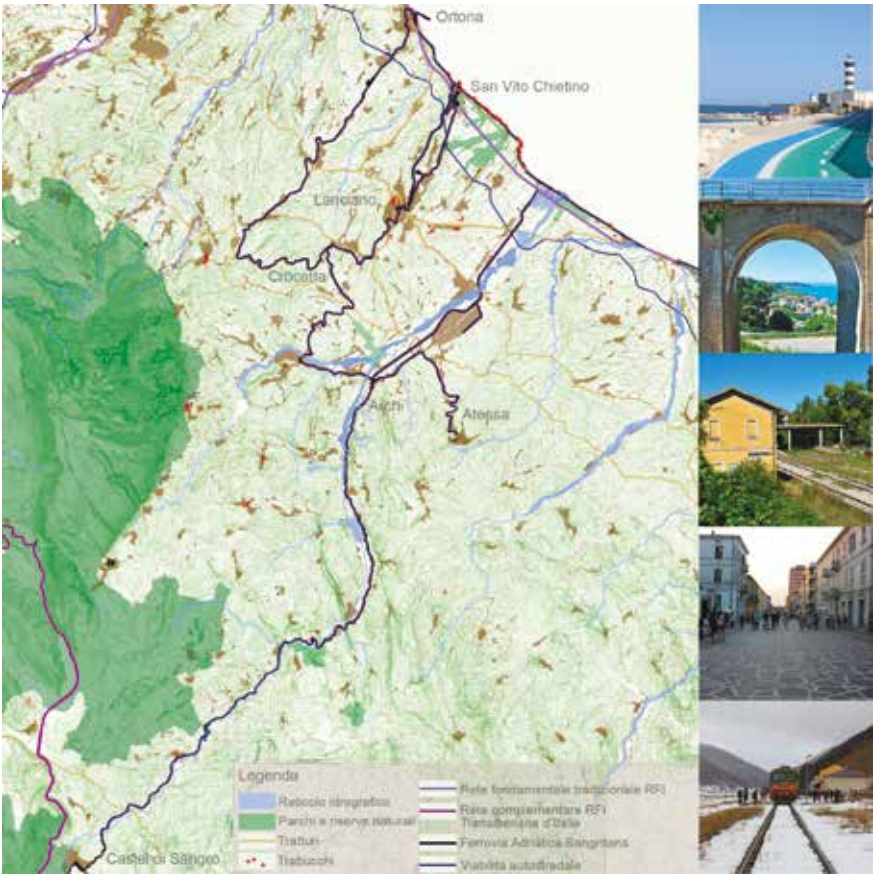

Fig. 2
The historic, infrastructural and natural networks from the Majella National Park to the Adriatic coast. (Author C. Ravagnan). On the right, from the top: the Trabucchi greenway in Ortona, the dismissed line in San Vito Chietino, the dismissed San Vito Trasbordo station, the historic centre of Lanciano and the Transiberiana d'Italia touristic line in the Majella Park.

regeneration scenarios between the coast and the small inner centers, illustrated in the final paragraph.

Infrastructural networks, environmental connections and cultural traditions, from the Adriatic coast to the inner areas of Abruzzo

The research *Resilience Paths. The relaunch and reuse of minor railways for the regeneration of fragile territories* has placed the theme of material and immaterial networks at the center of the reflection on the decline and regeneration of inner areas. From this point of view, the weaknesses and strengths of networks are considered, at the same time, main components of territorial fragility and strategic elements for regeneration through

an opportunity of relaunch of ordinary services, promotion of tourist railways or construction of greenways (Ravagnan, 2019).

Among the various case studies analyzed in the research activity, the Abruzzo region, located in central Italy, is an emblematic example for a reflection on the strategic role of divested railways for the purposes of territorial rebalancing, landscape fruition, environmental enhancement and urban regeneration of small centers and widespread heritage.

In this context, the area that involves the Provinces of Chieti and L'Aquila is characterised, on the one hand, by a weakness and abandonment of the railway network system, mainly due to its orography, which has low populated and isolated centers, with problems of accessibility; on the other hand, by a complex system of ecological, historical and infrastructural networks that connect the Adriatic coast to the inner areas of the Apennine ridge through paths dotted with historic centers and areas of strong landscape and naturalistic interest, with a strong identity linked to the memory of ancient, modern and contemporary history. (Fig.1)

In particular, among the many disused or underused lines in Abruzzo, the abandoned line that runs from San Vito Marina to Castel di Sangro, better known as FAS, plays a strategic role. As it crosses the Region it meets many small historic centers of great value (such as San Vito Chietino, Lanciano, Castel di Sangro), areas of high naturalistic value (from the Regional Nature Reserve Grotta delle Farfalle on the coast to the Majella National Park), signs of the stratification of the territory (such as the network of *tratturi*) and widespread historical elements; the FAS, in fact, connects the inner area of Basso Sangro-Trigno with the Adriatic infrastructural system and the coast near Ortona (Cf. Fig. 2), known for the very rough and inaccessible historic urban landscape and for beaches and cliffs whose icon is the famous *trabucco*, a complex artefact of the traditional local Adriatic coast, immortalized as a "fishing machine" by Gabriele d'Annunzio (Cf. Fig. 1).

The Sangritana Adriatic Railway, part of the secondary and regional network, was inaugurated in 1912, after a long and tormented gestation that lasted well over half a century. The project, part of a wider plan that intended to connect Naples to Rome but was suspended due to the fall of the Bourbon Kingdom, was entrusted to the Milanese engineer Ernesto Besenzanica and provided for a 156 km long line starting from the already existing Castel di Sangro station, which was part of the Sulmona - Isernia line, it followed the Sangro Valley, then continued to Casoli as far as Crocetta, where it bifurcated, continuing with a branch as far as San Vito Marina, passing through Lanciano, and with another branch towards Ortona, passing through Guardiagrele. To this main line was added another small trunk from Archi towards Atessa, which is the only branch that has been built with respect to the larger project of connections to nearby centers. The entire railway line was built in only four years, between 1911

Fig. 3
The historic centre of San Vito Chietino (ph. C. Amato, Google maps).

and 1915 and was electrified between 1921 and 1929, representing a great innovation in the technological and railway field as at that time it was the largest direct current electric railway in Europe.(Fig. 2)

In the first years after its construction, FAS, with its 1.3 million passengers per year and with 42 stops and stations serving 40 municipalities, excellently performed the tasks assigned to it, being the only direct connection of the Frentane and Sangro areas and acquiring a significant importance also in the transport of goods. However, the Second World War caused considerable damage to the FAS because of its strategic role as an important Adriatic-Tyrrhenian crossroads, it was systematically destroyed by the German Armed Forces, leading to the first suspension of service from October 1943. The line

resumed its activity only in 1945, when it returned to be accessible on the section from San Vito to Lanciano, as a result of the strong commitment of the Sangritana's staff who formed a "Cooperativa di Lavoro" for the voluntary reconstruction of the railway. In the '50s, after the industrial crisis of the post-war period, several economic operators began to invest in the Sangro Valley, opening industries, thus activating a reversal of the migratory phenomenon and a revitalisation of the area, stimulated by the existence of the Sangritana, the most comfortable and convenient means of transport for raw materials and products. (Fig.3)

Like many other minor railway lines, the FAS continued to perform its function until the '80s, when the slow but continuous decline in passengers, due to the increasing proliferation of road transport and the increase in the use of private motorisation brought the line San Vito-Castel di Sangro to the closure, despite the works promoted by the Ministry of Transports started extensive renovation work.

In the context, the idea of the reuse of the railway line in a tourist perspective was developed toward the opening of the *Treno della Valle* – the "Valley Train" - in 1987. The tourist convoy proposed the discovery of the historical, artistic and environmental heritage of the Valley of the Sangro River, reaching 35,000 attendees in 1994. The '90s marked a period of profound technological and infrastructural changes for the FAS and in 2005, in order to allow a rapid modernisation of the line, the railway service, already limited to the Archi - Villa S. Maria section, was definitively suspended between Lanciano and Castel di Sangro. Finally, with the opening of the new line between Ortona and Casalbordino by RFI (Rete Ferroviaria Italiana -Italian Railway Network) also the FAS trains abandoned the historic station of San Vito Marina and the old route to settle, through a new connection, in the new RFI station of San Vito - Lanciano.

The old railway path that climbs the ridge of San Vito Chietino, which once guaranteed the accessibility of the historic centers of San Vito and Lanciano and which is now replaced in the first section by the new railway network at the bottom of the valley, is now an abandoned line. Its closure, in addition to the state of abandonment of the territory, has temporarily canceled paths of privileged perception of the natural and cultural landscape, interrupting a network of material and immaterial cultural values between the coast and inner areas. This situation underlines the need of a multi-scalar and resilient strategy of regeneration that involves the different types of mobility trying to enhance the resources of the territory and the landscape and at the same time, face the long-standing problems of accessibility and improve the contemporary habitability of these territories.

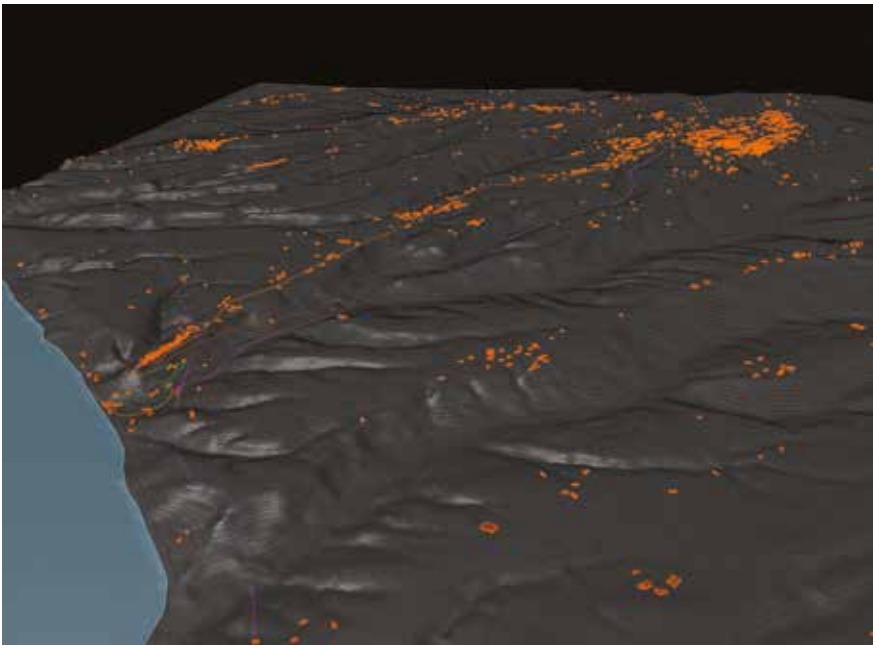

Fig. 5
3d automated landscape generation. Slow connection network in relation with orography. (Author D. D'Uva).

An intervention methodology for the reuse of the Sangritana railway between San Vito Marina and Lanciano

The Department of Architecture and Urban Studies of Politecnico di Milano, within the project *Fragile Territories*, has been conducting since 2018 a research project on territorial fragilities in Italy (C. Dezio et al, 2020). In the framework of the interdisciplinary research that is in progress at the time of writing this work, there is an in-depth study on the experimental mapping of the coastal and hilly territory that refers to the Costa dei Trabucchi. This territory has an orographic configuration characterized by deep river valleys transversal to the coastline, interspersed with hilly ridges where the most inhabited centers are located. Furthermore, the coastal areas suffer from a seasonal variation of the population that makes the mobility policies difficult, which may cope with both the winter and the more complex summer layout.

The research work undertaken by the Department aims to improve intermodal connections by using soft mobility strategies to connect the hill towns with the coast within an inductive process that starts from an empirical phase up to a proposed design strategy for the disused railway line between Lanciano and San Vito Chietino. In this general framework,

the aim of this paper is the illustration of the empirical survey of the different methods to manage the complexity of the relation between connections and territorial features.

The networks on this territory follow the constraints of the orography; Adriatic SS16 National Road, A14 highway and railway networks are fast connections that run along the coast; the slow ones, the local railway and the road are transversal. The intermodal node that connects these two families of networks is located in San Vito Chietino, which will be the subject of a more in-depth analysis. (Fig. 4)

(Fig. 5) In this territory the disused railway line that connects the coast with Lanciano overcomes the considerable height difference with an ingenious series of viaducts and helical tunnels. The analysis of this coastal strip has pointed out the need for orography assessment in the planning and design of slow mobility. This analysis was carried out using the tools of territorial analysis such as GIS in parallel with NURBS (Non Uniform Rational Basis-Splines) modellers, (D'Uva, Eugeni, 2019), interfaced with parametric digital tools (Bielik, 2012). The choice to operate with NURBS technology, instead of the traditional Mesh (D'Uva, Eugeni, 2020) was guided by the precision and effectiveness of multi-scalar manipulation, which are made possible only by the mathematical nature of the NURBS elements. The parametric 3D model of this area has been generated with the Open Data Cartographic database of the Abruzzo Region. In particular, DTM (Digital Terrain Model) raster, generated by interpolation of the altimetric data taken from the Regional Technical Map, has been used.

Through this digital ecosystem it was possible to accurately model the landscape at the large scale of the Lanciano - San Vito line and at the small scale of the San Vito connection, which required a different deepening. The three-dimensional landscape modelling, which includes building, railway and roads networks, was very useful to undertake a quantitative analysis. For developing a soft mobility policy, it has been necessary to analyze the slope of all the roads of the area with a specifically designed parametric tool, selecting paths with a value of less than 10%.

The analysis was applied to the area of San Vito Marina, where the disused station is a node of connection between the "Costa dei Trabucchi" greenway and railway network. Due to a lack of georeferenced data, a GPS tracking survey was performed of the greenway. From this node, the connection with the current-San Vito-Lanciano station has been hypothesized over the dismissed line. From this node has been applied the slope algorithm already explained to identify on the road network which could be the easiest connection with the dismissed helical railroad. (Fig. 6)

This methodology allows a fluid elaboration of the three-dimensional model starting from the DTM, despite the limits imposed by the computation time of the single steps. It has been

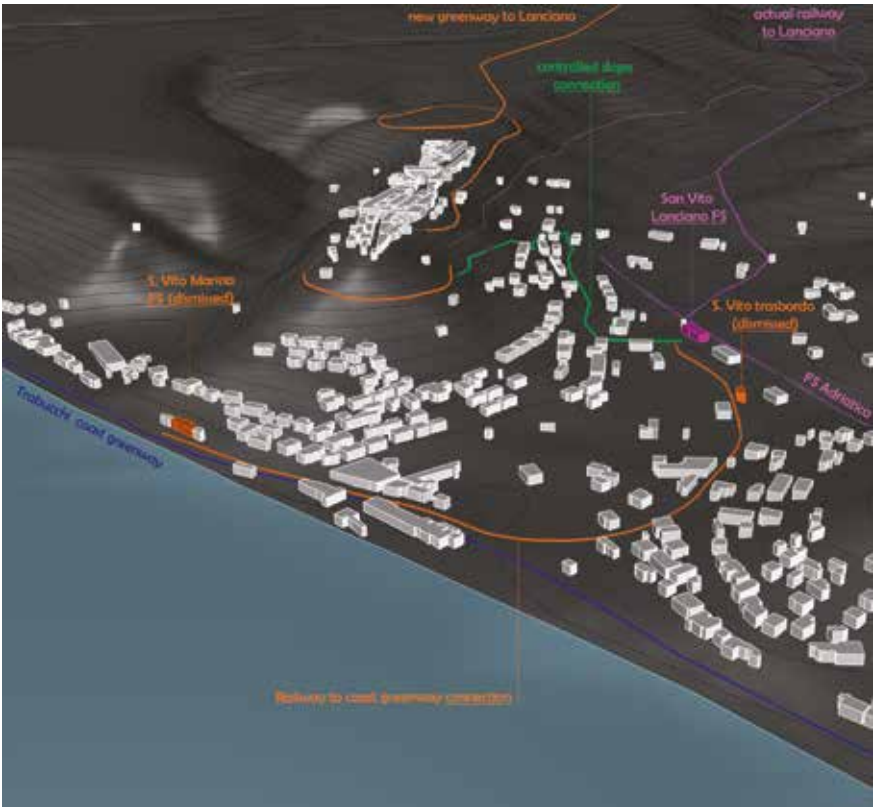

Fig. 6
Study of San Vito Marina Area - controlled slope connection path has been automatically generated with an algorithm that worked through the minimum slope between actual and dismissed railway network. (Author D. D'Uva).

necessary to set some compensatory parameters that could optimize the precision of the model with the real possibility to elaborate it to reach the aforesaid fluidity. The first step of the procedure involved the Abruzzo region DTM raster, which had a mesh of 10 meters; creating the 3d landscape with this resolution would have lengthened the computational time too much. The analysis was finally carried out by reparametrizing the starting raster into a new image with a 40 meters' pitch, which is lighter in computational terms. The generation of the digital urban landscape for the general framing of the Lanciano - San Vito line and the one for the head station was elaborated with the same algorithm but produced two different results. This algorithm takes as an input the polygons of the building outline, projects them on the DTM, creates a plane passing through the centroid of the projected outline, makes a new projection on this new plane, extrudes the polygon of a fixed height and creates the roof of the buildings. The algorithm independently

performs this series of operations on all 18237 buildings in the area, but it would require an extremely long computation time, so all the buildings were used only for the analysis of the area surrounding the San Vito station, freezing all the artifacts outside the single analysis area. For the generation of the digital landscape of the entire analyzed segment, a filter was used that extracted only 1515 buildings whose surface is larger than 500 square meters, then inserted in the algorithm as input. This selection was necessary not only for the already exposed computational reasons, but also for the optimization of the representation. Because of the computational burden and the different road layout, the next step of the research will be the application of the same methodology to the Lanciano node.

Scenarios of integrated regeneration between the coast and the smaller centers

The multidisciplinary analyses carried out on the territory configure the reuse of the abandoned FAS line in San Vito Marina-Lanciano section as a project of environmental regeneration, infrastructural mending, landscape fruition that takes strength from the presence of the new railway line - to which it could be connected with intermodal hubs - and from the connection with important naturalistic and historical paths such as the *Greenway of Trabucchi* along the coast and the *Tratturo* L'Aquila-Foggia. The proposed analysis could be the methodological reference for drawing up a design strategy, which could lead to social and economic regeneration. (Fig. 7)

The slow mobility path is meant as a vector of connection between the coast and the inner areas, to be combined with a possible restoration of the *Treno della Valle* and of the ordinary railway line. This dismissed track run between Lanciano and Archi and between the new station of Fossacesia-Torino di Sangro, Archi and Castel di Sangro, that is recognized as essential network in the *Strategia d'Area interna Basso Sangro-Trigno*.

It also reaches in Castel di Sangro the "Transiberian Railway of Italy", a touristic line promoted on a dismissed secondary line, known in terms of revitalisation of small centers (Amato & al., 2020).

This network could represent a system of functional and cultural relations that have been found indispensable also for rebalancing scenarios between the tourism and road traffic pressures on the coast and the decline of inner areas, creating opportunities for synergic and sustainable interactions based on the enhancement of places and sustainable goals defined at National and International level (SNAI, 2013; SNSVS, 2017). This proposal represents, first of all, a contribution for the reflection and experimentation on multi-scalar and non-sectorial approaches to mobility interventions, taking into account the main problems

Fig. 7
The regeneration of the station of San Vito Trasbordo and the railway line. (Author: C. Amato).

Fig. 8
The regeneration of the railway line toward San Vito Chietino. (Author: C. Amato).

(environmental vulnerability, technical issues, infrastructural heritage, relations with large infrastructures) and at the same time the considerable opportunities (regional and national accessibility nodes, cultural paths, historical urban landscape) of fragile territories. (Fig. 8)

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AN INNOVATIVE ANALYSIS TOOL FOR SMALL TOWNS' VALORIZATION. THE RICCIA MUNICIPALITY'S CASE STUDY

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Università degli studi di Salerno-Italia

a) Photo of the Riccia's historical center; **b)** Location of the buildings in the Riccia historical center involved in the "Wellness Village" strategy – Source: by courtesy of the Riccia Municipality.

In Italy, as in other Countries, the depopulation of small towns is an ongoing consistent phenomenon. The risk is the disappearance of a vast material and immaterial heritage, beating heart of national identities.
Moreover, in an era characterized by environmental and metropolitan crisis, small towns can play a crucial role, reshaping the broken relationship between cities and countryside. With so much potential, the need to protect and valorize these realities is immediately evident and urgent.
A sustainable development of territories is possible, but in order to achieve this, it is essential to consider small municipalities as the main driving force for radical change. Nevertheless, too often administrations prove to be unable to deal with the multiplicity of factors that characterize small towns, by carrying out inadequate valorization interventions that sometimes do not respect the real local needs.
In light of the above, the work investigates the theme of valorization, proposing an innovative analysis tool aimed at selecting the most effective projects to be implemented in small towns. The complexity of the actions to be undertaken and the multitude of parameters to be examined lead to consider multi-criteria analysis models such as the Analytic Hierarchy Process (AHP). Thus, the presented tool combines multiple criteria (social, economic, environmental and historical-architectural) characterized by additional sub-criteria and evaluation indicators. The model is then applied to the Riccia Municipality's case study with the aim of testing its operation and validity.

Keywords: Small towns valorization; small towns recovery; sustainable development; innovative multi-criteria analysis tool.

Introduction

The depopulation of small towns is a widespread phenomenon that involves many European and non-European Countries. However, in recent years there has been a gradual change of direction. In fact, with the progress of the environmental crisis and the gradual laceration of the city-countryside relationship, there is a growing awareness of the importance in rediscovering internal realities. Currently, an increasingly shared idea is that «the city, as it has always been in the past, needs to create a balanced relationship with the surrounding area because it shares with it the environmental resources on which depend the most important challenges on the future of metropolitan areas. It is for this reason that the discussion around

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

small towns is also involving large urban centers»[1]. Taking the argument to extremes it is, therefore, plausible to say that the dichotomy city-village represents two sides of the same coin, in which one element compensates the other and *vice versa*, in a perpetual relationship of interdependence. Nevertheless, the ongoing health emergency testifies the urgent need to change lifestyles, to look at reality with different eyes, improving the present. In this scenario, repopulating the small towns represents a concrete opportunity for the sustainable development of the territories, to rebuild a man-nature dialogue and rediscover local and national identities: «for the first time these territories [start] to be seen no longer only as a problem, but also as a chance»[2]. It is obvious, therefore, that the valorization of small towns is an increasingly discussed topic and there are many researchers and scholars who look at these realities with confidence and interest[3]. In this regard, there are many current arguments that look not only at social and economic, but also environmental, architectural, cultural and anthropological aspects.

Valorization strategies for small towns in inland areas

As mentioned in the previous paragraph, the recovery and valorization of the small towns are extremely topical subjects. The small municipalities witness local traditions and identities, and their disappearance would imply the loss of a considerable material and immaterial heritage. Moreover, «these territories have a huge historical-testimonial heritage that not only waits to be rediscovered and put on the web to some extent, but also seems to incorporate a craftsmanship that the contemporary can reinvent»[4]. In addition, with the metropolitan areas crisis, small towns represent «a slow model to counteract the stress of the global city, a sustainable use of local resources against the energy-intensive force of the metropolis […] a socially shared and healthy lifestyle opposed to the global loneliness and health risks of urban culture»[5].

In the face of these considerations, multiple valorization strategies have emerged both in Italy and abroad. More and more often it is spoken about *Alberghi Diffusi*, Wellness Villages, Artists' Villages, Ecovillages, Telematic Villages, Literature Villages etc., all

[1] Berizzi C., Rocchelli L., *Borghi rinati. Paesaggi abbandonati e interventi di rigenerazione*, Padua: Il Poligrafo, 2019, p. 12.
[2] De Rossi A. (edited by), *Riabitare l'Italia. Le aree interne tra abbadoni e riconquiste*, Rome: Donzelli, 2018, p. 5.
[3] In this regard, see the *Presentation* of the International Conference Proceedings STC2019, held at the University of Salerno on 19-20 September 2019: Fiore P., D'Andria E. (edited by), *Small towns…from problem to resource. Sustainable strategies for the valorization of building, landscape and cultural heritage in inland areas*, Milan: FrancoAngeli, 2019, pp. 17-19. The *Presentation* highlights the need for interdisciplinary efforts to address the complex issue of the small towns depopulation.
[4] De Rossi A. (edited by), *Riabitare l'Italia. op. cit.*, p. 102.
[5] Berizzi C., Rocchelli L., *Borghi rinati. op. cit.*, p. 13.

interventions aimed at acting, although partially, on the demographic decline trend of small realities, with the intent to promote their knowledge on a larger scale.

However, intervening in these places is not a simple operation: «it is a matter […] of giving life to complex evaluations that allow to highlight problems and resources and then to elaborate strategies, in a integrated planning perspective»[6]. Therefore, it is a question of adopting actions aimed not only at the reuse of buildings, but also at environmental and landscape preservation, together with infrastructural restoration and social cohesion. Thus it is clear that the revitalization of small Municipalities is feasible only with a view to a sustainable development of the territories, being evident the need to consider social, economic, environmental and cultural issues. Consequently, every project must inevitably be based on the sustainability principles.

Today, the strategies adopted are numerous and consistent, but do not always generate the desired effects. The reasons for this failure are many: they are mostly punctual actions, often the result of a will that is extraneous to the pre-existing dynamics and to the real needs of the context. In addition, social, cultural, economic, environmental and economic aspects are usually neglected and administrations are generally unprepared to deal with the multiple factors that characterize small realities. In general, it can be said that: «There has been […] a lack of thickening of the overall look […]. A recompositional operation, unprecedented to date, decisive also for the development of new representations and imagery»[7].

A significant step forward, although lacking an operational approach, is the recent Law n. 158/2017, which allocates European funds to Italian Municipalities with a population of less than 5,000 inhabitants. The aims are the recovery and valorization of small realities through the promotion of social, economic, cultural and environmental development.

There are also Italian and foreign associations for the safeguard of small settlements. The first group includes: *I Borghi più belli d'Italia*, l'*Associazione Borghi Autentici*, *Borghi Vivi*, *Legambiente*, ecc; the second: *European Network for Rural Development*, *Nos ruralités*, *Global Ecovillage Network*, *Nuevos Senderos*, *Rural Resettlement Ireland*, *Les Plus Beaux Villages de France*, *Sachsens Schönste Dörfer*, etc[8].

[6] Coletta T., *I centri storici minori abbandonati della Campania. Conservazione, recupero e valorizzazione*, Naples: Edizioni Scientifiche Italiane, 2010, p. 77.
[7] De Rossi A. (edited by), *Riabitare l'Italia*. *op. cit*., p. 8.
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A new operational tool

In light of the many material and immaterial factors that characterize small towns, together with the need to implement organic programmed interventions, it seems useful to set up operational tools aimed at selecting or implementing effective intervention strategies. This can be done according to multiple evaluation criteria (social, economic, environmental, historical-architectural), organized following a multi-criteria model, in compliance with the *Analytic Hierarchy Process* (AHP) algorithm. The AHP allows to break down complex decisional problems through a hierarchical structure at several levels: goal, criteria, sub-criteria, possible alternatives. Each element of the same level requires a comparison in pairs with each of the elements on the top level. The judgments of these comparisons are given on the basis of Saaty's fundamental scale in which:

- 1=Two elements are perceived as equally relevant (Equal importance);
- 3=The evaluation is moderately in favor of one element compared to another (Moderate Importance);
- 5=The evaluation is strongly in favor of one element over another (Strong Importance);
- 7=The evaluation is even more strongly in favor of one element than another (Very strong importance);
- 9=The evaluation is extremely in favor of one element compared to another (Extreme Importance);
- 2,4,6,8=When a compromise is needed (intermediate values between two evaluations).

The comparison in pairs returns square, symmetrical and reciprocal matrices in which each element has its own weight and from which it is possible to obtain the *eigenvector* and consequently the components of the *priority vector*. In this way the priorities of the elements are expressed and the alternative that best pursues the objective is selected. Then the main *eigenvalue* that determines the reliability of the matrices is calculated.

Within the work carried out, the goal is the valorization of small towns that it has been chosen to analyze according to three lines of research:

a. To recover the material and immaterial potential;

b. To re-propose productive vocations;

c. To insert local values in a positive circuit of knowledge and promotion.

This goal is pursued through 4 main criteria that are related to sustainable development: social criterion, economic criterion, environmental criterion, cultural criterion. The latter, because of the topic dealt with (the valorization of small towns), specializes in historical-architectural aspects.

Tab. 1 Hierarchical scheme with goal, criteria and sub-criteria – Source: Nesticò A., D'Andria E., Fiore P., "Small towns and valorization projects. Criteria and indicators for economic evaluation", Valori e Valutazioni 2020, 25, p. 6.

Goal | Small towns valorization			
Social criteria	**Economic criteria**	**Environmental criteria**	**Historical-architectural criteria**
• Local traditions and identities • Secondary urbanization works (kindergartens, schools, health facilities) • Social assistance services (services for the elderly, for disabled people, for immigrants)	• Productive vocations (agriculture, crafts, industry, commerce, tourism) • Primary urbanization works • (roads, parking lots, electricity network, teleph. network, gas network, public lighting, water network)	• Territory • Flora and fauna • Environmental quality (water, air, soil) • Urban core • Green areas • Building • Bioclimatic quality	• Territory • Integration with the environment • Urban core • Visual image • Dialogue between the urban fabric and its context • Full/empty relationship and green spaces system • Building • Formal relationship between building and urban core • Typological-distributive and typological-formal characters

Subsequently the criteria have been characterized in different sub-criteria. This operation was conducted by analyzing the peculiarities (invariants) of the small town type:

- Presence of local traditions and identities;
- Deficiency of services;
- Typical production activities;
- Distance from major cities;
- Deficiency of adequate infrastructure;
- Environmental quality;
- Insertion in a natural context;
- Limited and compact extension of the built fabric;
- 'Human scale' built dimension;
- Quality of the built heritage;
- Typological-constructive characteristics typical of the place.

After that, these so-called 'invariants' have been translated into sub-criteria and organized according to a hierarchical scheme, shown in Tab. 1.

Next step was to quantify the different sub-criteria through evaluation indicators. For the selection of suitable indexes it has been chosen to reduce the field, analyzing thematic areas

Tab. 2
Weighted scores for the social sub-criteria.

Sub-criterion	Weight	Considered indicator	Score	Obtained weighted score (O.w)	Maximum weighted score (M.w.)	% of O.w. compared to M.w.
Local traditions and identities	40%	• The number of cultural events • Taste's places	5 4	1,8	2	90%>60% **ACCEPTED**
Secondary urbanization works	40%	• Access to local/ neighbourhood services within a short distance • Number of public libraries	5 4	1,8	2	90%>60% **ACCEPTED**
Social assistance service	20%	• The number of assistance centers	5	1	1	100%>60% **ACCEPTED**

Tab. 3
Weighted scores for the economic sub-criteria.

related to the valorization of small towns. Specifically: urban sustainability, sustainable urban mobility, enhancement of historical-cultural heritage, territorial cohesion, rural development and landscape.

In this way, 15 studies were collected for a total of 470 indicators. The latter were further selected through 6 criteria: focus; relevance; accessibility; clarity; cost; frequency.

At the end of this process, there were 24 indexes for the social sub-criteria; 42 for the economic ones; 34 for the environmental ones; 38 for the historical-architectural ones.

Once the criteria, sub-criteria and evaluation indicators had been defined, it was necessary to give weight to the different sub-criteria, starting, first of all, by assigning the criteria (social, economic, environmental, historical-architectural) an equal weight (0.25 each), since they were considered equally important in pursuing the goal of valorizing small towns.

For the sub-criteria, targeted questionnaires were used, administered to specialized technicians and professionals.

In each questionnaire it was asked to how much one sub-criterion was considered more important than another on the basis of judgements taken from the Saaty scale[9].

[9] In this regard, see the text: Fusco Girard L., Nijkamp P., *Le valutazioni per lo sviluppo sostenibile della città e del*

Sub-criterion	Weight	Considered indicator	Score	Obtained weighted score (O.w)	Maximum weighted score (M.w.)	% of O.w. compared to M.w.
Productive vocations	50%	• The number of guest nights • Agricultural land use • Skills recovery	0 4 0	0,67	2,5	26,8% < 60% **NOT ACCEPTED**
Primary urbanization works	50%	• Quality of the street and sidewalks cover • Percentage of houses with communications (including electricity, water, sewage, gas, heating, internet, phone lines) • The number of public Wi-Fi places	5 5 5	2,5	2,5	100%>60% **ACCEPTED**

From the answers collected, the matrices for each sub-criterion have been developed (Figs. 1-4). This made it possible to obtain the weights of each element. An exception has been made for the historical-architectural sub-criteria, to which it has been chosen to assign equal weights.

After the weighing phase, the tool implementation was carried out through a case study: the Riccia Municipality in Molise Region.

The case-study application

The Riccia Municipality, in the Province of Campobasso, has 5,068 residents[10] for an urban area of 70.04 km^2.

In 2015, the old town center became "Wellness Village" following the realization of an innovative tourist project aimed at the welfare of the elderly. The Municipal Administration

territorio, Milan: FrancoAngeli, 2000, p. 76.

[10] ISTAT data, 2020.

Tab. 4
Weighted scores for the environmental sub-criteria.

Sub-criterion	Weight	Considered indicator	Score	Obtained weighted score (O.w)	Maximum weighted score (M.w.)	% of O.w. compared to M.w.
Territory						
Flora and fauna	14,5%	• Urban land take	5	0,725	0,725	100%>60% **ACCEPTED**
Environmental quality	32%	• CO_2 emissions • Presence of treatment systems	5 5	1,6	1,6	100%>60% **ACCEPTED**
Urban core						
Green areas	14,5%	• Green space	5	0,725	0,725	100%>60% **ACCEPTED**
Building						
Bioclimatic quality	39%	• Use of photovoltaic and/or solar panels • Energy class	5 5	1,95	1,95	100%>60% **ACCEPTED**

Tab. 4
Weighted scores for the historical-architectural sub-criteria.

has «made a survey of about 25 buildings located in the historic core to verify the consistency and the possibility of adaptation to the new destination»[11]. In this way, 5 buildings have been selected and recovered, for a total of 1000m^2 of net area (Figs. 5a-5b). To date, although the works have been conducted impeccably, both in terms of timing and technical-operational quality, the strategy has failed to take off. This criticality was due to the hostility expressed by users to live in the historic core. The reason for this aversion, as reported by the Councillor Antonio Santoriello, delegate for Culture and Tourism of the Riccia Municipality, probably lies in the common consideration of the historical core as a "degradation place". To this is added the evident difficulty of using some buildings: although in some cases elevators have been installed, in others there are unresolved architectural barriers such as very high stairs, differences in height, etc.

After a careful study of the Riccia's "Wellness Village" project, the model was applied. The first step was the choice – among the 24 indexes for the social sub-criteria, the 42 for the economic ones, the 34 for the environmental ones and the 38 for the historical-architectural ones defined above – of the indicators that best represent the "Riccia-case" and

[11] Source: Fanelli M., *Nuove strategie per la programmazione 2014-2020 della politica di coesione. Il Borgo del Benessere*, Riccia, 18 March 2016.

Sub-criterion	Weight	Considered indicator	Score	Obtained weighted score (O.w)	Maximum weighted score (M.w.)	% of O.w. compared to M.w.
Territory						
Integration with the environment	16,66%	Exceptionality of the historical-cultural characteristics of the landscape	5	0,83	0,83	100%>60% **ACCEPTED**
Urban core						
Visual image	16,66%	Landscape perceived beauty Landscape value of skyline	4 4	0,67	0,83	80,72%>60% **ACCEPTED**
Dialogue between the urban fabric and its context	16,66%	Panoramic sites	5	0,83	0,83	100%>60% **ACCEPTED**
Empty/Full relationship and green space system	16,66%	Preservation of relation systems between assets The number of green space reconstruction projects	5 4	0,75	0,83	90,36%>60% **ACCEPTED**
Building						
Formal relationship between the building and the characteristics of the urban core	16,66%	State of preservation of built heritage with reference to characterizing elements	5	0,83	0,83	100%>60% **ACCEPTED**
Typological-distributive and typological-formal characteristics of the building	16,66%	Preservation of the assets Use of historical-cultural heritage	4 0	0,33	0,83	39,76%<60% **NOT ACCEPTED**

whose data could be easily collected. Subsequently, all indicators have been analyzed and calculated giving each one a score from 0 to 5 in which generally:

- 0=zero/bad;
- 1=poor/inadequate;
- 2= discreet/sufficient;

	Local traditions and identities	Secondary urbanization works	Social assistance service	Sub-criteria weights	%
Local traditions and identities	0,40	0,40	0,40	0,40	40%
Secondary urbanization works	0,40	0,40	0,40	0,40	40%
Social assistance service	0,20	0,20	0,20	0,20	20%

Fig. 1 Social sub-criteria weights - Source: Elaboration by authors.

- 3=good;
- 4=commendable;
- 5=a lot/excellent.

These judgements were obtained by crossanalyzing the results of the strategy implemented by the Riccia Municipality, the effects that the latter has activated on the neighboring context, and the other «complementary interventions to enhance the reception capacity of the territory, designed to qualify public spaces and improve the tourist fruition with urban furniture, construction of parking lots and parking areas, setting up itineraries and thematic routes»[12].

Each evaluation indicator was thus quantified through a score (from 0 to 5) obtained either by mathematical formulas, by comparison with the laws in force, by questionnaires administered to the population, or by the sensitivity of the technician involved in the judgment.

These results have been inserted in tables in which each score has been multiplied with the weight related to the sub-criterion of reference (Figs. 1-4), in order to obtain a total weighted score (O.w.). The latter was compared with the weighted score obtained in the hypothesis that all indicators have a maximum grade (M.w.), i.e. 5. In this way, it was possible to calculate the goodness of the detected weighted score (O.w.) by comparing the two weighted scores: O.w., to be accepted, must be more than 60% M.w . Tabs 2-5 show the above.

Tables 2-5 highlight two weaknesses of Riccia's "Wellness Village" strategy:

The low integration of local traditions in the recovery of the historic core and the selected buildings

The failure of the tourist offer for the elderly that officially declares the need to reinvent the strategy, rethinking another role and another project goal.

Fig. 2 Economic sub-criteria weights - Source: Elaboration by authors.

These questions emerge strongly in the economic criterion and in the historical-architectural one, in which there is, for the sub-criteria "Productive vocations" and

[12] Source: Fanelli M., *Nuove strategie per la programmazione 2014-2020 della politica di coesione. op. cit.*

	Productive vocations	Primary urbanization works	Sub-criteria weights	%
Productive vocations	0,50	0,50	0,50	50%
Primary urbanization works	0,50	0,50	0,50	50%

"Typological-distributive and typological-formal characteristics of the building", a weighted score lower than the maximum threshold allowed (60%). This means that any subsequent intervention will inevitably have to deal with these results and try to provide valid answers to the encountered problems.

Conclusions

There are many valorization strategies that, especially in the last decade, are emerging in the panorama of the small towns recovery. However, not all of them achieve the desired results. This condition is often due to the realization of punctual interventions, not very careful to the context's needs. In other cases, such actions are unsuccessful because they lack an initial socio-anthropological survey, which often leads to the involvement of users with little interest in that type of proposal. All this stems from the complexity of small towns, which offer significant challenges in many fields: social, cultural, economic, environmental, political, etc. The difficulty lies precisely in facing, understanding and solving the problems related to the different issues, while maintaining control of an overall framework of the situation. Thus, the risk is to invest resources in projects that are not fully related to the soul of the place and to its concrete needs.

The presented tool investigates the state of the art and the strategies implemented in the small towns through an accurate and meticulous analysis of several issues: social, economic, environmental, historical-architectural, with the aim of detecting their weaknesses. In this way, the model directs local governments to a rapid and systematic understanding of fragilities, offering the possibility of remedying those gaps that may not be evident in the project phase.

In the case of Riccia, the instrument showed, with a low score, both in the economic and historical-architectural sub-criteria, a clear weak point in the "use of historical-cultural heritage" and in "the number of guests per night". This is because the strategy is addressed to users who have not found in it an answer to their needs and who have probably not been fully involved in the initial program of the proposal. Moreover, it has emerged that little attention has been given to local skills, which are not very active in the strategy development.

	Flora and fauna	Environmental quality	Green areas	Bioclimatic quality	Sub-criteria weights	%
Flora and fauna	0,14	0,17	0,14	0,13	0,145	14,5%
Environmental quality	0,28	0,33	0,28	0,37	0,32	32%
Green areas	0,14	0,17	0,14	0,13	0,145	14,5%
Bioclimatic quality	0,43	0,33	0,43	0,37	0,39	39%

Fig. 3 Economic sub-criteria weights - Source: Elaboration by the authors.

SUB-CRITERIA	WEIGHTS
Territory	
Integration with the environment	16,66%
Urban core	
Visual image	16,66%
Dialogue between the urban fabric and its context	16,66%
Empty/Full relationship and green space system	16,66%
Building	
Formal relationship between the building and the characteristics of the urban core	16,66%
Typological-distributive and typological-formal characteristics of the building	16,66%

Fig. 4 Historical-architectural sub-criteria weights - Source: Elaboration by authors.

In light of these considerations, supported and proven by the obtained results, it is evident the need to direct the project proposal to another type of stakeholders.

From a first study of the place, considering the close proximity of the Riccia Municipality to the smaller one of Jelsi and the Jelsese path of the *Via Micaelica*, a solution could be the conversion of the "Wellness Village" strategy into "Pilgrim's Village", offering hospitality solutions for wayfarers who approach this new form of religious tourism. In fact, there is a growing need to explore the ancient paths, to re-establish contact with nature and to rediscover one's own territory. The reconversion effort of the receptive structures already realized in Riccia would be minimal: the project would be addressed to travellers who would spend the night in accommodations more than suitable to their needs, using also a common canteen where they could socialize, besides the possibility to cultivate, and consequently to enjoy, the vegetable gardens, whose realization was already foreseen in the project "Wellness Village". Guests may also be included in local craft and cooking programs.

Another alternative could involve the University of Molise students who would find excellent accommodation in Riccia, with cheap rooms and meeting areas. Riccia, in fact, is only 37 minutes by car from Campobasso. In this case, it would be a task of the Administration to set up a shuttle service, dedicated exclusively to the new "Student Citadel".

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MONTECASTELLI PISANO AND CERBAIOLA: VIRTUOUS SURVIVING EXAMPLES OF TWO SMALL OLD VILLAGES

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The little church of Cerbaiola, where the roof has been redone but no interventions have been carried out on the walls.

This work analyses the interventions carried out in two close villages, Montecastelli Pisano and Cerbaiola, located in southern Tuscany, in an old mining area called "Colline Metallifere" (Metalliferous hills). Both villages have suffered a strong depopulation after the cessation of the mining activity. Fortunately, both of them are still surviving albeit with different strategies.
Montecastelli Pisano was a mining centre in the Medieval Period and later, in the XIXth century, due to a copper vein discovery. Nowadays only 60 people reside in the village but thanks to a small group of willing foreigners who have found here their refuge, the village is rich in cultural activities. Cerbaiola was founded in 1750 as an open countryside village, with an agricultural function, 4 km far from Montecastelli. In the early 60^{s} of the last century, with the end of sharecropping, this small village was completely abandoned and has slowly undergone a process of transformation in ruins. In the 80s part of the buildings have been restored entering in the rural accommodation circuit. The methodologies adopted in the building refurbishment/conservation will be examined in the belief that only by searching for compatible solutions in terms of materials, structures and functionality, it is possible to become promoters of an effective conservation of the rural villages as an architectural heritage of the Mediterranean countries.

Keywords: building materials, Colline Metallifere, survival strategies, Montecastelli Pisano, Cerbaiola

Introduction

Human settlements are the result of historical events and of the men's work, and are constantly evolving, responding to various natural and/or anthropic solicitations. There are two possible evolutions:
-progressive abandonment and transformation into ruins of these inhabited centres that still retain traces of materials, building technologies and traditional construction systems, becoming time windows on past history;
-continuity of housing, despite the progressive change in the methods of use due to changes in the local economic activities, historical events, etc.
In this case very often the settlement suffers transformations both on individual historic buildings and in the urban layout with a possible irremediable loss of a significant cultural heritage. This lack of attention was normally due to a lack of recognition of the value of the

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Fig. 1
the two villages of Montecastelli Pisano and Cerbaoiola in the "Colline Metallifere" of southern Tuscany (after Google Earth, modified).

Fig. 2
the urban system of Montecastelli with concentric circles around the Pannocchieschi castle (after Google Earth, modified).

inherited architectural heritage, considered as obsolete and incapable of responding to current performance and functional requirements.

However, it should be noted that a greater awareness has developed about the value of this architectural heritage, which in Italy, as in the whole Mediterranean region, for centuries influenced travellers, artists and architects and it actually characterizes and identifies the nations themselves (Rudofsky 1964; Carver 1979; AA.VV . 2014)

This new awareness is also manifested at the legislative level. The article 30 of the Code of Cultural Heritage (2004) establishes that the State, the regions, the territorial public authorities as well as the private owners must guarantee the safety and conservation of their cultural heritage properties.

According to art. 29 of the Code, conservation should be ensured «through a coherent, coordinated and planned study, prevention, maintenance and restoration». The latter is defined as «direct intervention on the asset through a complex of operations aimed at both its material preservation and recovery, and at the protection and transmission of its cultural values».

Unfortunately, the interventions carried out in many Italian villages highlights how these purposes have not always been pursued. Sometimes the architectural assets, even if protected by the law, have undergone interventions that have modified their identity and compromised their conservation over time. Although the re-use of buildings according to new functions is to be considered the way through which to ensure their conservation,

often the interventions determine their radical transformation altering the testimonial value of valuable cultural resources (Fratini et al., 2019b). Certainly, architecture is to be considered a "living work" and, as such, destined to undergo continuous changes over its existence. The signs left by the modifications, necessary from time to time, testify to its evolution and, at the same time, its «vitality» (Vassallo, 2007). Projects on existing architectures should be drawn up taking care to control the needed changes. Interventions should be carried out promoting the objective of quality in contemporary additions without endangering the cultural value of the assets (Council of Europe: Framework Convention on the Value of Cultural Heritage for Society, 2005). It is in fact a matter of minimizing the modifications and/or destructions and of planning any additions taking care to respect the signs of the past (Musso & Franco, 2015; Vegas & Mileto, 2015; Acar Bilgin 2019).

This paper intends to focus on the analysis of the interventions carried out in two close villages, Montecastelli Pisano and Cerbaiola, sited in the "Colline Metallifere", an area of southern Tuscany sparsely populated that in the past was characterized by a widespread mining activity and at present by the exploitation of the geothermal energy (Fig.1). Both villages

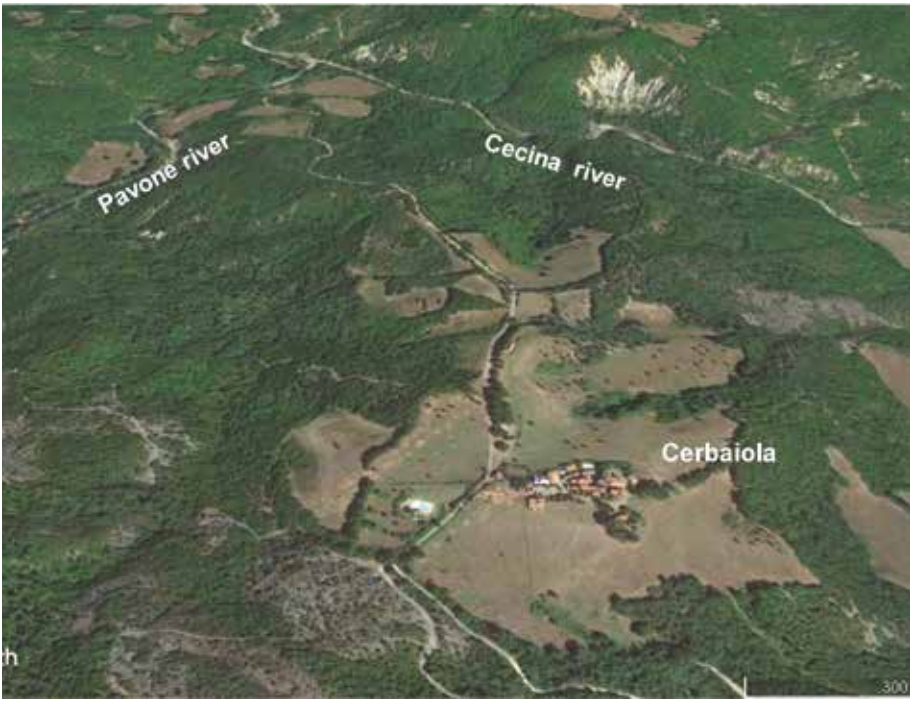
Fig. 3
the Pannocchieschi tower with its scarp base under restoration.

Fig. 4
the village of Cerbaiola, in a dominant position above the valley of Pavone and Cecina rivers (right) (after Google Earth, modified).

have suffered a strong depopulation, even Cerbaiola in past decades has found itself in a state of neglect, but both are surviving albeit with slightly different strategies.
The methodologies adopted in the building refurbishment/conservation will be examined in the belief that only by searching for compatible solutions in terms of materials, structures, and functionality, it is possible to become promoters of an effective conservation of the most diffused architectural heritage of the Mediterranean countries, that represented by the rural villages.

Historical information and socio-economic aspects

Montecastelli Pisano is located at the top of a hill 500 m above sea level, on the watershed between the valley of Cecina river from that of Pavone. The village has developed with an urban system with concentric circles (Fig.2) around a castle attested since the beginning of the XIIIth century, remained almost uninterruptedly under the control of Volterra until the end of the XVIIIth century when it was incorporated in the territory of Castelnuovo Val di Cecina (Schminke, 2015). The remains of the walls at the base of the houses of the external perimeter and the access door on the southern side are still visible. Of the original castle only the Pannocchieschi mighty tower is left, with a square shape and



a scarp base (Fig.3). On the top of the hill there is also the Romanesque church of Santi Filippo and Giacomo, dating back to the XIIIth century. The village houses a Museum of Rural Life, born in 1985, which documents the agricultural activity and local craftsmanship. As previously mentioned, among the productive activities, besides agriculture and forestry, mining had great importance. The Pavone valley was known since ancient times for the copper and silver mineralizations embedded in the local ophiolitic rocks. Abandoned in the Middle Ages, the Medici tried to reopen the mining activity on several occasions until in 1832 the discovery of an important copper vein, enabled the exploitation that continued until 1869. During the period of activity, the mine had a great importance in the economy of the area managing to employ many hundreds of people.

After the Second World War, like most marginal areas, Montecastelli suffered an important depopulation. At present only 60 people reside in the village, many of the houses have become second houses of those who once lived there or had their family of origin, others have been purchased by "foreigners", others remain unsold also because the most sought-after dwellings are those isolated in the country, often transformed into "farmhouses".

Fig. 5
the square of the little village of Cerbaiola.

Certainly, it should be noted that after the crisis period from the 70s to the 90s, the village managed to recover, increasingly outlining its vocation as a welcoming village in the name of tranquillity and cultural activities. This was possible particularly thanks to a small group of willing foreigners who have found their refuge in this small village: the *Auditorium della Compagnia*, born in a deconsecrated church, organizes classical music concerts in the summer; theatre, folklore, painting and sculpture exhibitions are also organized in the former school which has become the *Centro Polivalente Montecastelli*. In the village there is a bar-restaurant which is also the meeting point of the local community, two other restaurants, a garage, but no grocery stores, while the receptivity is guaranteed by the farmhouses that dot the splendid countryside of this little-known area of Tuscany, rich in wild areas covered by dense Mediterranean scrub and alive because of the presence of endogenous energy testified by the numerous steam emissions that characterize the landscape.

Cerbaiola is a small village dating back to 1750, completely isolated, in a dominant position at 350 meters above sea level on the valley of the Cecina river (Fig. 4). In the distance, on a high hill there is Volterra. This village can be reached after 4 km of unpaved

road which starts from Montecastelli and ends there. It was born as an open village, without defensive walls, with an agricultural function, so that the inhabitants were close to the workplace and could use common services. Until the 50s, 14-15 families lived there, for a total of about 100 inhabitants, who, except three families of direct farmers, worked "*a mezzadria*" (as sharecroppers) for the owner of the farm. In 1952 the farm was purchased by Serafino Corsolini, from Pescia Romana, in the *Maremma* near Viterbo, who had it managed by a farmer who lived permanently in the village.

To testify the history of this community, in which all the children had the same nurse, there are the manor house, the small church, the school, which was a multi-class, the common bread oven, the stables. With the end of sharecropping, in the early 60s, this small village was completely abandoned. In 1963 a part of the village with the surrounding farm was bought by a farmer from the province of Latina, while the remaining part by a Florentine. The buildings owned by the latter have suffered a process of ruin and at present are for sale while the first owner, in addition to the cattle breeding activity, was at least concerned to keep the roofs of its buildings in good condition. The grandchildren still live in the village continuing the farming activity and since the 80s they have renovated the houses by inserting them in the rural accommodation circuit (*Borgo La Cerbaiola*, *Casa Vacanze Le Pelaghe*). Some of these houses have been sold to private individuals who spend the holidays there but, in their absence, these houses are managed by the original owners as rural accommodation.

Arriving in the village, there is a particular atmosphere because not everything has been restored, the spaces between the buildings are all unpaved, there are still buildings in a state of ruin, the square is a parking area for some tractors and agricultural machines (Fig.5). Around the village the cattle graze in the wild. On a country road it is possible to reach the bottom of the valley, at the confluence of Pavone and Cecina rivers where, in the clear waters, it is possible to take suggestive baths. In the silence it can happen to see mouflons, wild boars, porcupines drinking. Nevertheless, to meet the requirements of rural tourism, in a field outside the village a swimming pool overlooking the valley has been realized.

The disadvantages of this small village, its complete isolation, an exclusively agricultural economy, have now become its strengths, with a sustainable redevelopment, which was done "on tiptoe". The tourist who arrives, especially if there are other tourists who are guests of the various houses, can partially experience the village atmosphere of the past. A holiday that is a discovery is offered, giving pleasant emotions in an isolated environment surrounded by nature that is still partly wild.

Fig. 6
unworked serpentinite blocks for the bearing walls and square blocks of limestones as corner stones in Cerbaiola.

Fig. 7
Cerabaiola, the frame of a window made of bricks.

Local geology and building materials

In the past, the materials used to build towns and villages were almost exclusively those available locally. Each territory was characterized by its own building materials and its own finishing techniques. In the territory of the peninsula, thanks to the great geological variability and the presence of small states, which lasted until the second half of the XIXth century, these differences are particularly evident even on a small scale as in the case of Montecastelli and Cerbaiola (Fratini et al., 2019a). Both villages are located on a vast outcrop of serpentinite rocks. This lithotype originated through the metamorphism of a peridotite, a magmatic rock belonging to the Earth mantle. It is present in the ophiolitic complexes of the northern Apennine, remnants of the Giurassic oceanic lithosphere that now are exposed in the Ligurian tectonic units of eastern Liguria, Tuscan Apennine and Colline Metallifere.

However, Cerbaiola is also located near outcrops of marly limestones belonging to two different formations, the Palombini Shale Formation (Lower Cretaceous) and the Helmintoid Flysch Units (Early-Middle Eocene), both belonging to the Ligurian tectonic units, while in the vicinity of Montecastelli, organogenic limestones of the Messinian and Pliocene ages are present, deposited in marine basins above the Ligurian tectonic units.

This circumstance has determined the fact that the two villages differ greatly for the building stone materials that have been utilized. In Cerbaiola, almost exclusively unworked serpentinite blocks of irregular shape have been used with square blocks of marly limestones and organogenic limestones as cornerstones (Fig. 6). The frame of the openings are either in bricks or sandstone. (Fig. 7)

In Montecastelli the private houses are in mixed masonries realized with unshaped or roughly shaped blocks made of prevailing organogenic limestone and secondary bricks, serpentinite, marly limestones (Fig. 8). Sometimes the bricks prevail particularly in the modest houses. The corner stones are often made of organogenic limestone (Fig. 9). The frames of the windows are generally in bricks and the portals are in organgenic limestone, sandstone, sometimes realized with great care. Regularly shaped blocks of organogenic limestone have been used in the parish of Santi Filippo and Giacomo and in the Pannocchieschi tower, where the cornerstones are in sandstone.

The use of unworked serpentinite blocks in Cerbaiola can be explained by the difficult processing of this kind of rock material to obtain regular blocks, requiring expert stonecutters, not justified by the importance of the buildings. The serpentinite outcrops are in fact characterized by a fracturing without any preferential directions, from which only irregular shaped blocks are obtained. In addition, the sound material is very hard and tends to chip with processing.

On the contrary the processing of the marly limestone to obtain regular blocks is easier because, although the material is very hard and has a tendency to chip with processing, nevertheless in the shaping of the stone ashlars, it is possible to take advantage of the beds more suitable in thickness, like those lower than 30 cm, often crossed by regular fractures (Dipasquale et al., 2016). This is why it has been used as a cornerstone. Moreover, this material has a very high durability against the action of atmospheric agents.

As for the organogenic limestones, these are quite soft stones, easy to work and shape in regular blocks, like the stones used in Salento and Sicily for the Baroque architecture. Generally, this material shows a low resistance to decay which is manifested by strong alveolarization phenomena. Nevertheless, the variety of organogenic limestone present in this territory is quite resistant to decay as testified by the conditions of conservation of the ashlars exposed since the Middle Ages in the parish of Santi Filippo and Giacomo and in the Pannocchieschi tower.

Restoration and reuse interventions

The access to Montecastelli from the southern gate of the ancient walls introduces to a village that is neat and well-kept but not adapted for use and consumption by tourists. In this sense it is a “true village”, which maintains a charm, not done to be visited but to be lived. There are buildings with façades that give the impression not to have been affected by interventions since the XIX century while part of the houses has undergone interventions in the external walls in more or less recent years, from the 60-80s until now, recognizable on the

Fig. 8
Montecastelli: mixed masonries made of unshaped/ roughly shaped blocks made of prevailing organogenic limestone and bricks, serpentinite, marly limestones.

Fig. 9
Montecastelli: corner stones are often made of organogenic limestone.

style and materials used. The Pannocchieschi tower is currently being restored while there are no buildings in the state of ruin. Overall, you get the impression of spontaneous interventions by individual owners, not regulated by municipal provisions. An intervention planned at the level of the entire village was instead the renewal of the paving of the alleys using sandstone slabs worked in a herringbone pattern.

The interventions of the 60s and 80s were those less respectful of the formal aspect of the façades and less appropriate as regards the type of materials used. In fact, there are realizations of terraces, cement renders that sometimes show extensive falls, cement repointing of the mortar joints among the stone blocks and bricks, rebuilding of jambs and lintels of the service openings on the ground floor (garages and warehouses) , shutters and sheet metal doors.

The most recent interventions consist in the renewal of parts of façades or entire façades with the elimination of the degraded lime plasters and repointing the joints with abundant hydraulic lime mortar to partially cover the stones and bricks.

With regard to Cerbaiola, we have already mentioned that part of the houses is in a ruin. By observing these buildings, it is evident that some of them were rendered with a lime

mortar. In buildings that have undergone maintenance since the 80s, three situations are observed:

- the renders, when present, were eliminated with a following repointing with abundant hydraulic lime mortar to partially cover the stones;
- repointing with abundant hydraulic lime mortar even in the case of original absence of a render;
- absence of intervention in the stone facings without original render.

The frames of the windows and of the entrance doors, if interested by an intervention, have been realized in brick. The doors of the windows and portals are made of wood.

The external access stairs to the first floor, when present, have remained original with the stone steps worn by the use.

Overall, these interventions are respectful of the architectural typologies and are appropriate for the type of materials used. Emblematic in this regard is the small church on which the roof has been redone but no interventions have been made on the walls which are in exposed stone with remains of the old lime render (Fig. 10).

Conclusions

Generally, the desire to make the architectural artefacts responsive to the changed functional/performance requirements determines the irreparable alteration of the testimonial value of valuable cultural resources. The existing buildings are made suitable for current days uses and better environmental performances without establishing a dialogue with their historical value. Nevertheless, Montecastelli Pisano and Cerbaiola have survived maintaining evidence of their history in their building materials so strictly connected to the local geological resources.

Both villages are "true village", not to be visited but to be lived and this is testified by the building heritage which presents different aspects: there are buildings that give the impression not to have been affected by interventions since the XIXth century, houses that have undergone interventions in the 60-80s (those less respectful of materials and formal appearance) and buildings interested by recent interventions. These ones show particular attention to the conservation of the peculiar architectural characteristics both concerning the building materials and the formal appearance therefore testifying the development, in recent decades, of a new sensitivity towards vernacular architecture while guaranteeing the adaptation of the architectural artefacts to present functional and performance requirements.

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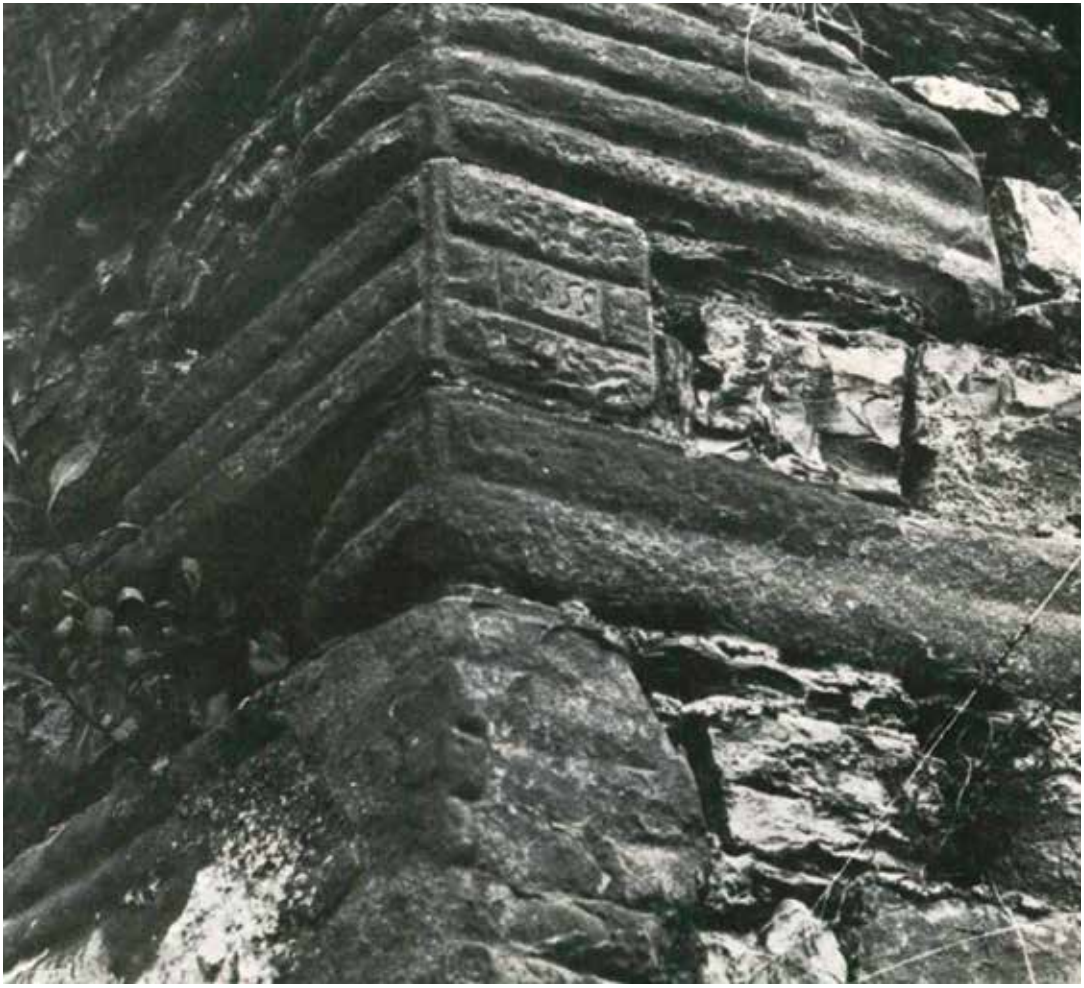

A MODERN ARCHITECTURE IN THE HISTORICAL BUILDING OF UGLIANFREDDO

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Architect, freelance, Firenze-Italia

Cantonal dated 1659.

Conservation strategy for abandoned villages must include a valorization aspect, utilization, as simple conservation normally is not self-sustainable. The problem is to search functions that turn on compatible with the context and don't pervert it. The revitalization of these territories starts from reading the existing manufacts, reinterpreting the techniques of the past.
This paper provides the point of view of a professional who creates new architectures but strives to consider the memory and identity of the ancient historical structures. This project starts from an historical research and analysis, doesn't ruin the old part, doesn't annulate it, but stands aside, with an echo and valorization of the heritage.
The location is Uglianfreddo, a little village in Rosaro valley, Lunigiana, Italy, with architectures dating back to the Middle Ages. The study starts from an analysis of the historical construction of the entire geographical unit of the Rosaro valley, with its urban centers built entirely of sandstone and evolves in a restoration direction.

Keywords: revitalization, conservation, Middle Ages, Lunigiana.

From Cerri to Fivizzano

Lunigiana is an Italian historical area between Liguria and Tuscany regions and takes its name from the ancient Roman city of Luni, located at the mouth of Magra river. The Rosaro valley, 70 square kilometers wide, takes the name of the tributary of the stream that crosses it from north to south. Several historically important routes radiate from Fivizzano, Lunigiana main town, in Rosaro valley, with individual settlements along them, showing historical stratifications and peculiar typological and morphological characteristics. Since late Middle Ages people from Serchio and Aulella valleys run across the path from "ai Cerri" village to reach the Fivizzano, ancient important production and commercial center, the "Florence of Lunigiana" as writer Caselli call it (Caselli 1933). In "Cerri" there aren't rest station architectures, despite the importance of the axis, but rather a fortified stronghold. A short distance away there is Uglianfreddo, a cluster of buildings that gather around a church; some of them are now renovated, suitable as holiday homes, others in decay conditions or ruins. From Uglianfreddo, a mule track enters the center of Po village, where heavy renovations in recent decades have prevented the recovery of evidence from the past. Continuing along for

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Fig. 1
Lunigiana map dated 1767 (in Florence the state archives).

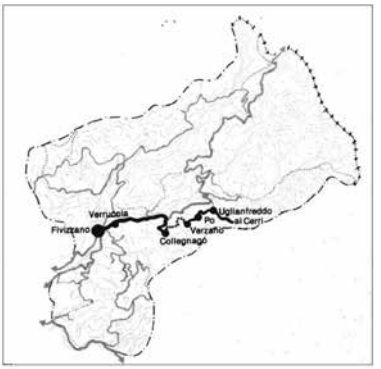


Fig. 2
Map of the itinerary that crossed the Rosaro valley.

a 10-minute walk, the mule track reaches Verzano, a cluster of houses organized on the slopes, dating back to the 18th century, with renovations in the following century; despite the signs of recent maintenance, a certain respect is observed for the traditional image of this small settlement which still appears as a small agricultural community. After Verzano the mule track reaches Collegnago; after Piazza della Chiesa di Santa Caterina the track descends towards Verrucola where severe towers appear, they were the fortress of Bosi family and fortified residence of Spinetta Malaspina; Verrucola appears today as largely medieval village dominated by a castle. After Verrucola,

Materials and construction techniques

Sanstone is the principal building material in Rosaro valley; its use was not only limited to local area, but it was exported outside, giving birth to a real mining industry. A "Comacine master" was present in Fivizzano before year 1000; these Lombard workers brought the techniques and styles of stone architecture in this wide geographical area; many wooden houses were gradually replaced by solid masonry structures with extensive use of sandstone which was considered the material par excellence. Their presence is directly testified by architecture archaeological analysis in the 14th century (Merzario 1893).
In 1892 a study of engineer Amerigo Raddi (Raddi 1892) described both the composition and the technical characteristics of Fivizzano sandstones, dividing them into two groups according to the color: the "serene" ones in light gray with bluish reflections and the "gray" compact and a little darker. The compressive strength is approximately 806 kilograms per square centimeter, according to performed tests. Only after World War II the relentless invasion of reinforced concrete caused the definitive collapse of the local extractive industry; today only one quarry is exploited, many abandoned ones are

Fig. 3
To Cerri: oldest block in which a 16th century portal appears.

recognizable in middle Rosaro valley where finer and more compact sandstones emerge.
The construction techniques and styles used in Rosaro valley can only be read on materials analysis, as oral testimonies of last workers are no longer available; therefore, everything that is reduced to ruins is of great interest to the actors of the building sector, as most of them expose their internal skeleton and junction points (Ferrando, Mannoni 1993, Ferrando Cabona, Crusi 1980, Ferrando Cabona, Crusi 1981).
The external wall texture technique certainly undergoes a progressive loss of accuracy over the years: the rows of regular ashlars organized in courses and firmly embedded in mighty angles disappear, and in the 16th century they are replaced by a chaotic weaving produced by different elements and shapes.

Targets

This journey through Rosaro valley aims to revitalize the relationships between individual settlements and their typological and morphological characteristics, by reinterpreting ancient techniques of the past. The redevelopment of the ancient paths, that from renowned Fivizzano lead to the Apennine mountains through walks surrounded by greenery, can expand the tourist offer and the urban centers that rest on this green ribbon. They can become meeting points for relaxation, a stimulus for the restoration and reconstruction of buildings through innovative design solutions, paying particular attention to the historical-witness

Fig. 5
The entrance to Uglianfreddo.

Fig. 6
The partly ruined dwelling.

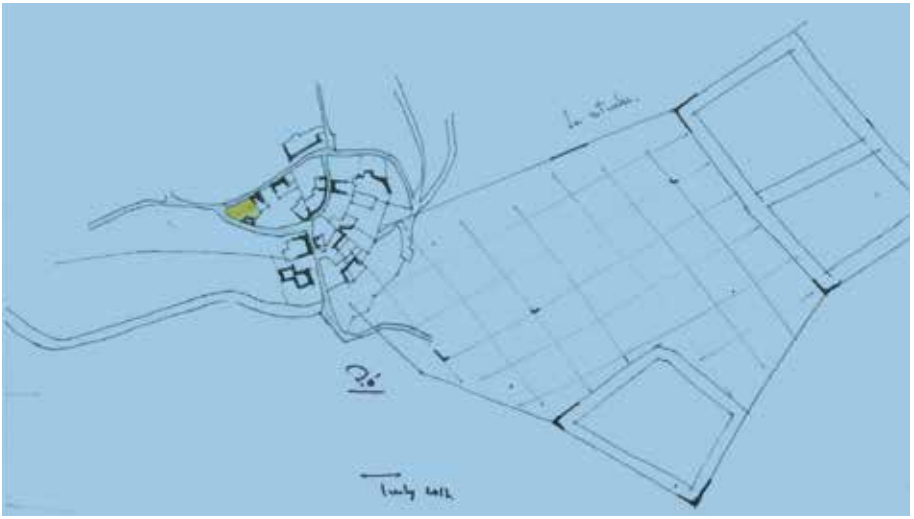
value (PITTALUGA 2009), to the morphological characteristics and to the environmental and landscape context, faithfully tracing the compositional morphology, but with essential, unequivocally contemporary forms.

The journey through Rosaro valley, with the reading of the existing and all that its presence is telling us, aims to reinterpret the techniques of the past with the purpose of revitalizing, beyond the individual settlements, the systems of relationship that linked them with their typological and morphological characteristics. Therefore the redevelopment of the ancient paths, which from Fivizzano, which has always been a renowned destination, lead to the Apennine mountains through walks surrounded by greenery, can expand the tourist offer and the urban centers that rest on this green ribbon and become meeting points for the relaxation, a stimulus for the restoration and reconstruction of buildings through innovative design solutions, paying particular attention to the historical-witness value, to the morphological characteristics and to the environmental and landscape context, faithfully tracing the compositional morphology, but with essential, unequivocally contemporary forms.

Fig. 7
Study sketches.

The project

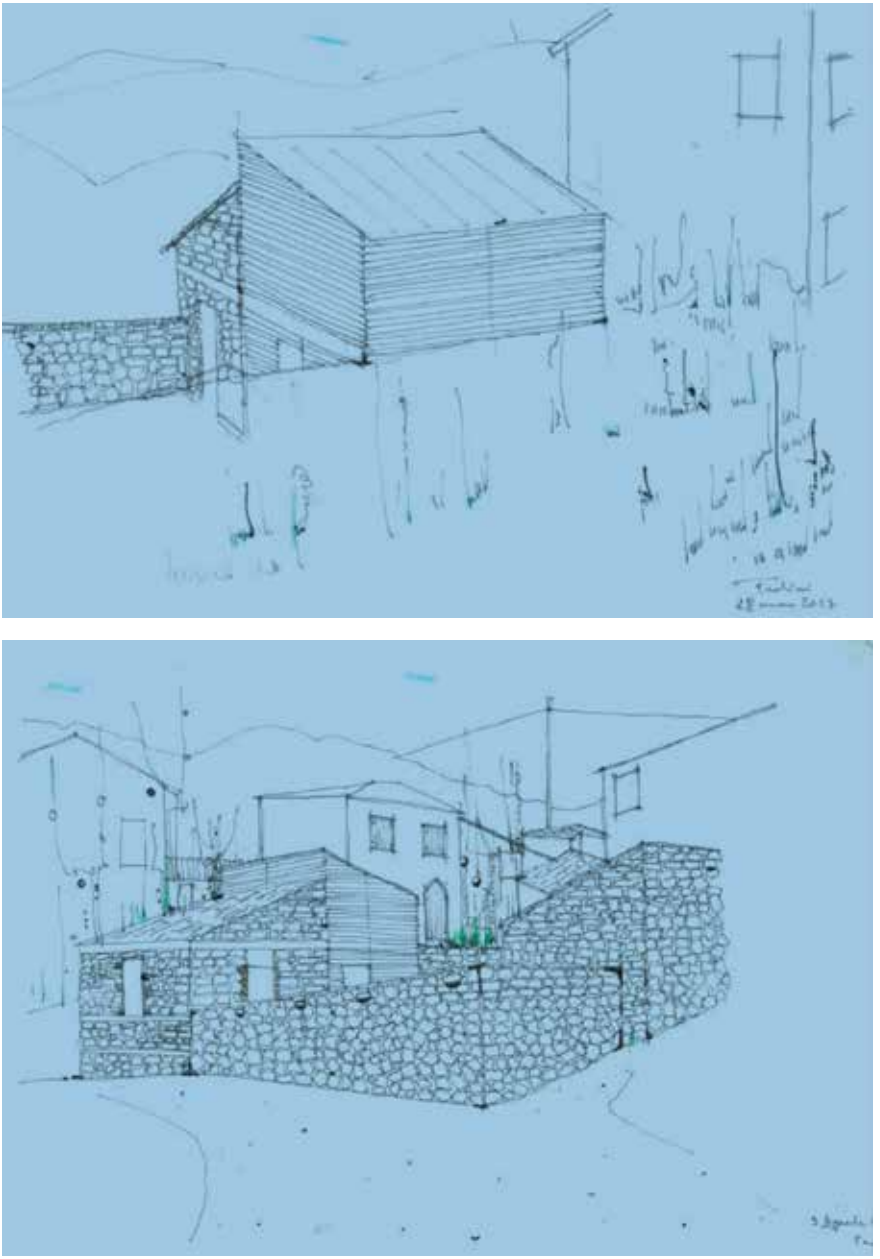
A stone dwelling lies at Uglianfreddo entrance, having strong character of the enclosed courtyard house Beside it use as a country house, it could also have had the function of controlling the entrance to the settlement. This is a dwelling consisting of two buildings, one of the two partially collapsed because of the earthquake of September 1920. The project involves the faithful reconstruction of the ruined volume, both in plan and in the elevations, with HEA-type steel pillars lined externally in stone, to which are anchored

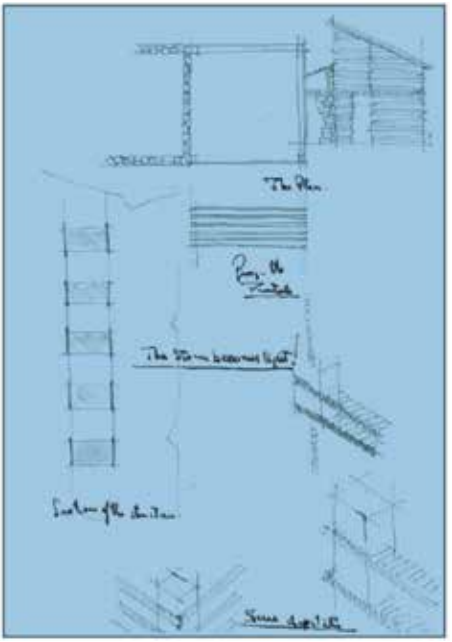


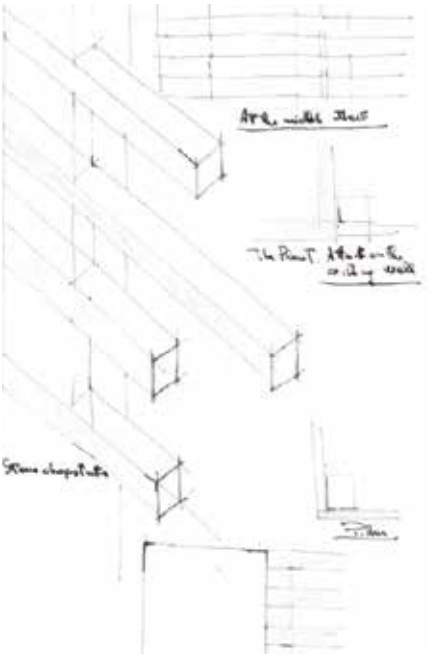
vestments consisting of strips of stone 30 x 60 x 2000 mm arranged at intervals of 70 mm to simulate the rows of regular ashlars organized in courses and firmly clamped within angular loops characteristic of the 14th and 15th centuries, thus creating a cage that protects inside a double-layered glass skin that shines in the evening like a lantern at the entrance to the settlement. The restoration of the existing volume, not contemporary as you can read from its stratification, provides for its conservation with a water cleaning of the masonry and subsequent transpiring protection.

It is the project that gave birth to this research on the ground and in the archives, looking for the key to enter the heart of these articulated stone clusters, showing what an irreplaceable contribution a small and simple recovery proposal is able to give to the reconstruction of the past. Material remains, visits to workshops, meeting with the locals and glimpses at the disused quarries, more often than not lead to reflections and acquire importance in establishing a relationship between the past and the present in the perspective of future choices.

Fig. 8-9-10
Study sketches.







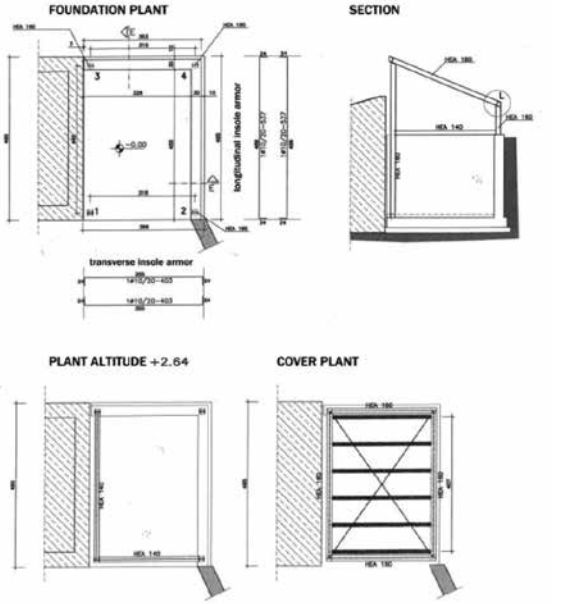


Fig.11
The steel structure.

Fig.12
Render.

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SIMIT

LES PROCESSUS D'ABANDON ET DE RESIGNIFICATION DES LIEUX APRÈS LE TREMBLEMENT DE TERRE: DEUX ÉTUDES DE CAS SICILIENNES EN COMPARAISON

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Belìice 1968 Démolitions suites au tremblement de terre de 1968 du centre ancien de Gibellina. Source: Archive CRESM.

The reconstruction processes consequential to the Belìce earthquake in the Seventies have generated phenomena of abandonment that interrupted the connection between places and communities. After fifty years from the earthquake, these processes are still unresolved and therefore question the principle of cultural responsibility towards the past and the cultural heritage. The persistent condition of abandonment of the survived historic centers has safeguarded the integrity of their heritage. Nonetheless, it denounces the inertia of the institutions in promoting actions of preservation and enhancement. As a result, we observe bottom-up resignification processes lead by cultural associations via episodic initiatives of valorization. In most of the cases, these initiatives fail as they are not systematic. The contribution is therefore intended to analyze two Sicilian case studies affected by the earthquake in 1968. From one side, the two examples were subjected to a different approach in the relocation process, where the abandonment of historical centers was a planned necessity. From the other, the abandon is now the result of a conscious choice that has favored hybridization between the old settlements and the new ones. Moreover, those hybrid processes result in a partial resignification of places. To conclude, the comparison of these Sicilian examples highlights the need to overcome the condition of abandonment through strategies and policies capable of triggering processes of valorization and resignification by leveraging the recognition of cultural values and memory.

Keywords: Belìce, earthquake, abandonment, resignification, identity

Introduction

L'abandon des villages est un témoignage culturel des processus historiques, sociaux et économiques qui reflètent le lien complexe entre les lieux et les communautés. En Italie, ce phénomène est généralement lié au dépeuplement des zones marginales "internes", d'autres fois il est dû à des événements traumatisants tels que les tremblements de terre, les inondations et les catastrophes en général. Dans les deux cas, la perte de contrôle sur le territoire interrompt le réseau de petites communautés grâce auxquelles les lieux peuvent continuer à "vivre" et à "raconter" leurs mémoires.

L'interruption des relations entre les communautés et les lieux détermine en fait un "traumatisme" qui constitue un tournant entre un "avant" et un "après". Les processus complexes de création de nouveaux modes de vie, de nouvelles valeurs et de lieux de reconnaissance qui en découlent, provoquent une désorientation qui se résout le plus souvent par un

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raccommodage avec le passé qui peut avoir lieu par des processus de résignation et des opérations de reconstruction de l'identité et de la mémoire collective. Le manque d'entretien des lieux provoque un lent processus de dégradation du patrimoine bâti qui, s'il n'est pas arrêté, peut aboutir à la perte irréversible de la consistance matérielle et à la création de véritables ruines, si celles-ci ne sont pas causées par des événements de nature traumatique et catastrophique. En particulier, l'abandon des centres habités à la suite d'événements sismiques et les politiques de relocalisation qui en ont résulté, lancées en Italie dans la deuxième moitié du XXe siècle, sont encore l'occasion de réfléchir au principe de responsabilité auquel nous sommes appelés, et de mieux comprendre la relation étroite entre abandon, refondation, resignification des lieux et reconstruction de l'identité.

Ce qui reste est en fait un témoignage de valeur historique et de culture matérielle, dont la préservation et la valorisation peuvent être considérées comme une occasion de déclencher un processus de partage et de réappropriation de l'identité, ainsi que la revitalisation du tissu socio-économique et culturel. En outre, conformément à la Convention de Faro, il constitue un patrimoine culturel dont nous sommes tous responsables[1] et qui doit être sauvegardé et transmis aux générations futures.

À partir d'enquêtes *in situ*, la contribution vise à analyser deux études de cas de la Sicile occidentale dans lesquelles l'abandon des villages, survenu après le tremblement de terre du Belìce en 1968 et lié aux processus de reconstruction basés sur des programmes de relocalisation totale ou partielle, ouvre des pistes de réflexion intéressantes sur les stratégies et les politiques lancées dans les zones touchées cinquante ans après l'événement sismique. En particulier, là où le séisme et les démolitions incontrôlées n'ont pas effacé les traces de l'histoire, il est possible de faire une lecture partielle des caractères et des valeurs identitaires des anciennes villages, en reconnaissant une dichotomie et une hybridation intéressantes entre les anciennes et les nouveaux villages. Dans certains cas, ces traces ont fait l'objet de processus de requalification au cours desquels il est possible de souligner l'importance du rôle des associations culturelles engagées dans l'entretien des lieux, dans la sensibilisation de la population et dans la promotion touristique du territoire. Dans d'autres cas, elles témoignent de l'inertie des institutions et de la nécessité d'une protection active garantissant la conservation d'un patrimoine commun et de valeurs culturelles, identitaires et mémorielles partagées, qui peuvent se traduire par des actions concrètes de restauration et de mise en valeur.

[1] Art. 1, *Convention de Faro*.

Le tremblement de terre de Belìce

Après la Seconde Guerre mondiale, l'Italie s'est trouvée confrontée à une nouvelle urgence: les 14 et 15 janvier 1968, la Sicile occidentale a été dévastée par un tremblement de terre qui a ravagé la Vallée de Belìce. L'événement sismique et les processus de reconstruction qui ont suivi ont déterminé de profondes transformations du tissu infrastructurel, socio-économique et politique et des matrices culturelles. La reconstruction a été abordée avec un système d'interventions qui ont entraîné des transformations dans le contexte socio-économique, urbain et paysager par le biais de programmes de relocalisation partielle ou totale[2] des établissements basés sur une planification imposée d'en haut.

La réorganisation après le séisme a eu des conséquences sur le patrimoine matériel et immatériel: la destruction des lieux et leur abandon consécutif ont entraîné une perte d'identité et de mémoire, qui n'a pas été suivie d'un processus de reconstruction "sociale" basé sur l'importance du psychologique[3] et la préservation des valeurs identitaires. Les processus de reconstruction ont en effet été marqués par le développement de lois spéciales et d'instruments de planification liés à l'aménagement du territoire qui ont favorisé la délocalisation et la fondation de nouveaux villages afin de les "faire entrer dans la modernité"[4]. Cela a, d'une part, accéléré les processus d'effacement et d'abandon du patrimoine concerné, en négligeant l'importance de la valeur de la mémoire dans la première phase, et d'autre part, a naturellement généré de nouveaux équilibres dans lesquels les communautés ont ressenti le besoin de rétablir le lien avec le passé et leur propre identité à travers des processus complexes de réappropriation des lieux abandonnés. Dans d'autres cas, cependant, la nécessité de préserver et de reconstruire l'identité a conduit à une re-signification des lieux et à des processus de construction d'une "nouvelle" mémoire collective qui est toujours en cours. En particulier, le séisme a remis en question non seulement la capacité de l'État et des institutions à faire face aux problèmes liés à la phase d'urgence et de reconstruction, mais aussi la capacité de la culture architecturale, urbanistique et de restauration à répondre aux besoins de la reconstruction par des plans, projets et interventions capables de combiner les besoins conservateurs et psychologiques liés à l'urgence de la reconstruction. Les anciens centres soumis à des programmes de relocalisation partielle ont été partiellement reconstruits et, cinquante ans plus tard, le patrimoine qui subsiste n'a été que peu touché par la logique de la récupération et est en grande partie en ruine et en état d'abandon, voire en attente de démolition pour des raisons de sécurité publique. Dans certains cas, des travaux de restauration et

[2] Rendus officiels par le décret présidentiel du 30/05/1968 et par la loi de reconstruction n. 241/1968.
[3] Pane, *Il canto dei tamburi di pietra*, 270-281.
[4] ISES. *L'ISES nella Valle del Belice*, 74-76.

de reconstruction ont été effectués sur des sections de la ville ou des monuments individuels, grâce à une relecture plus ou moins critique de ce qui a été perdu. Dans d'autres cas, des interventions ont prévalu qui ont tenté de restaurer l'image de la ville à partir de la reconstruction de ces espaces publics dans lesquels la communauté pouvait se reconnaître[5]. En particulier, la récupération de parties des anciens centres à proximité des zones nouvellement construites a généré de nouvelles relations avec le paysage et les systèmes de peuplement hybrides.

La relecture critique des résultats de ces processus cinquante ans après le séisme permet donc d'appréhender les transformations profondes des relations entre les communautés et les lieux. En particulier, l'analyse des centres de Santa Margherita di Belìce et de Poggioreale, touchés par des processus de reconstruction diamétralement opposés, permet de réfléchir sur les résultats des politiques menées et des processus d'abandon et de revalorisation des lieux encore en cours.

Santa Margherita di Belìce

Le village de Santa Margherita di Belìce, gravement endommagé par le séisme, a été inclus dans les programmes de relocalisation partielle[6]. Le déménagement a ainsi été évité, délimitant plutôt la possibilité de sauvegarder le tissu historique grâce à l'instrument du Plan détaillé pour la restauration des centres historiques[7]. En outre, l'action menée au cours des trente dernières années par les organismes de protection a garanti la préservation du noyau ancien et des urgences monumentales. Le processus de reconstruction n'a donc pas effacé les traces de l'histoire mais les a intégrées dans le tissu, qui a été partiellement reconstruit, favorisant la création de nouvelles relations. La conservation plus ou moins étendue du tissu historique et la reconnaissance de la valeur culturelle du tracé urbain d'origine ont en effet déterminé le développement d'un processus de reconstruction visant à restaurer partiellement l'image du vieux centre et à en reconstruire une nouvelle sur l'ancien tracé, donnant ainsi vie à un système de peuplement hybride dans lequel il est désormais possible de reconnaître la matrice historique.

Le développement, ces dernières années, de politiques de protection visant à garantir la préservation de ce qui subsiste encore a donc favorisé les interventions de reconstruction visant à reconfigurer l'image de la ville et de la place principale qui, aujourd'hui presque entièrement reconstruite, agit comme une "charnière" entre les ruines du noyau ancien,

[5] Voir les interventions réalisées sur l'église Mère et sur le Palais Filangeri-Cutò.
[6] Comme prévu par la loi n. 241/1968.
[7] Le plan détaillé a été approuvé en 1974.

preuve historique du tissu original du village, et les bâtiments modernes du nouvel établissement construits selon les directives de conception fournies par *Istituto per lo Sviluppo dell'Edilizia Sociale*[8] (ISES). En particulier, les zones de nouvelle expansion interrompent le maillage orthogonal original et rompent avec les caractéristiques historiques traditionnelles. Le lent processus de reconstruction a donc entraîné une transformation complexe de Santa Margherita, qui se caractérise aujourd'hui par une triple identité: une ville entièrement reconstruite sur la base de nouveaux modèles urbains et architecturaux, une partie du centre historique reconstruite de manière presque philologique, et une partie du tissu le plus ancien, datant du XVIe siècle, encore en ruine et en attente de reconstruction.

Cependant, l'imposition d'une contrainte de protection du paysage et la reconnaissance de la valeur historique et identitaire du tissu survivant, qui n'a eu lieu qu'en 2000[9], n'ont pas arrêté la dégradation progressive due à l'état d'abandon. Cela montre à quel point les politiques actives de protection et de conservation ont joué un rôle marginal dans le processus de reconstruction, malgré le fait que des instruments réglementaires étaient en vigueur pour la reconnaissance des valeurs culturelles des centres historiques siciliens[10]. Ce n'est que ces dernières années, en effet, qu'il y a eu une intervention progressive sur le patrimoine survivant et abandonné, visant à sauvegarder et à valoriser les caractéristiques du tissu urbain et du paysage en tant que valeurs d'identité et de mémoire. En particulier, le début de ce processus a été garanti à la fois par la loi régionale pour la protection des centres historiques et par une protection contraignante et des premières déclarations d'intérêt historique, artistique et architectural en vertu de la loi 1089/1939 relative à des portions du noyau ancien, en tant que témoignage de l'histoire et des événements urbains de Santa Margherita di Belice[11]. La reconnaissance de la valeur de mémoire historique du centre ancien a également été reconfirmée par le périmètre identifié par le Plan régulateur[12] en 1995 et par d'autres déclarations d'intérêt culturel émises en 2000 et 2015 visant à éviter des altérations irréversibles de l'état des lieux qui auraient pu endommager «les conditions de perspective, de décorum et de cadre environnemental des bâtiments d'intérêt historique et artistique»[13]. Cependant, les demandes de protection n'ont été suivies d'aucune action concrète de conservation et de mise en valeur. En fait, le patrimoine survivant, dont la municipalité détient la propriété, est

[8] Organisme chargé des interventions sur les bâtiments en cas de catastrophes naturelles sous la tutelle du Ministère des Travaux publics.
[9] *Dichiarazione di notevole interesse pubblico dell'area comprendente il centro antico e la circostante area rurale in agro di S. Margherita di Belice*.
[10] Définies par la loi régionale n. 70/1976.
[11] Décret de contrainte n. 1984 du 29/08/1988.
[12] Art. 23 *(Quartiere S. Vito e quartiere S. Calogero e S. Michele)*-ZONE A du PRGC.
[13] D.D.G. n. 4862 du 28/12/2015.

Fig. 2
Santa Margherita di Belice. Vue aérienne. Source: Cimino, 2018, 172-173.

toujours en état de ruine, dans un état d'abandon, la plupart du temps menacé de démolition pour des raisons de sécurité publique, en attendant que la protection se traduise par une prise de conscience collective de la valeur du patrimoine culturel, de manière à déclencher des actions visant à préserver et à transmettre ce patrimoine aux générations futures.

Fig. 3
Santa Margherita di Belice. Ruines de l'ancien noyau. Auteur: Nadia Frullo.

Ruderi di Poggioreale

Le centre habité de Poggioreale faisait partie des programmes de relocalisation totale élaborés par ISES qui supposaient l'abandon et la démolition des zones habitées détruites par le séisme et leur "refondation" dans un nouvel ordre territorial, urbain et socio-économique qui devait entraîner une transformation radicale de la structure sociale et du logement. Poggioreale a en effet été déclaré inhabitable, abandonné et reconstruit à quelques kilomètres en aval de la colonie d'origine. Cependant, contrairement à d'autres villes du Belìce, Poggioreale n'a jamais été démolie. Le seul abandon a donc garanti la préservation du noyau ancien en ruine, en sauvegardant la lisibilité du tracé orthogonal régulier typique des villes nouvellement fondées qui se sont développées en Sicile entre les XVIe et XVIIe siècles, et les caractéristiques de l'architecture locale traditionnelle[14].

[14] Antista e Sutera. *Belice 1968-2008*, 45-52.

Les ruines de Poggioreale sont en effet un témoignage d'une grande valeur culturelle et paysagère, elles sont le signe tangible de ce qui a été effacé de la reconstruction, et identifient les valeurs perdues au nom de la modernité et du développement économique qui auraient dû sortir la Vallée du Belice de son retard. En se promenant sur les anciennes routes du village, il est donc possible de reconnaître à la fois les signes de la destruction causée par le tremblement de terre et les signes d'une mémoire suspendue dans le temps, où chaque artefact conserve les traces de la culture matérielle.

Aujourd'hui, la zone du tissu historique est "protégée" par une contrainte d'inedificabilité absolue et est identifiée dans le Plan de paysage comme "Centre historique détruit par le tremblement de terre de 1968"[15]. La Municipalité est soumise à l'élaboration de Plans de Récupération à travers lesquels elle peut initier des politiques visant à sa revitalisation[16].

Les ruines de Poggioreale sont également protégées par le *Codice Urbani* et identifiées dans

[15] Art. 37, *Norme Tecniche di Attuazione*.
[16] Directive 11/06/2012: *Direttive da seguire, ai sensi dell'art. 3 comma 4 della L.R n. 15/1991, per l'aggiornamento e la rielaborazione del Piano Regolatore Generale del Comune di Poggioreale.*

Fig. 4
Ruderi di Poggioreale. Piazza Elimo. Auteur: Nadia Frullo.

Fig. 5
Ruderi di Poggioreale. Fontaine Largo Cannoli. Auteur: Nadia Frullo.

le Plan de paysage[17] comme "Centre, noyau historique, paysage urbain de valeur" caractérisé par des objectifs de protection et de mise en valeur en tant que patrimoine archéologique et nœud principal appartenant à un système culturel reconnu comme un objet identitaire complexe de protection du paysage. En particulier, la protection en tant que zone archéologique détermine la possibilité de réalisation et de valorisation également à travers l'inclusion dans des itinéraires culturels et des circuits muséaux capables de communiquer et de transmettre les caractères de l'histoire et de la mémoire liés à l'identité de la communauté du Belìce.

La reconnaissance de ces valeurs communes dans la communauté locale a conduit à la création d'une association culturelle appelée "Poggioreale Antica" qui, de 2011 à 2019, a joué un rôle actif important dans la promotion du tourisme culturel et la sensibilisation de la communauté à la conservation, la valorisation et la muséalisation du vieux noyau. Cela a permis de maintenir sa mémoire vivante également grâce à un soin constant des lieux qui a facilité la lecture et l'appréciation de la communauté en tant que musée en plein air. Ce processus déclenché "par le bas" peut être reconnu comme une action

[17] *Piano Paesaggistico degli ambiti 2 e 3 ricadenti nella provincia di Trapani.*

subsidiaire à celle de l'État dans la promotion de l'éducation au patrimoine[18], visant à former une communauté de patrimoine engagée à promouvoir la conservation et la transmission aux générations futures[19] de l'ancien noyau de Poggioreale. Cependant, en 2019, elle a subi un revers soudain qui a conduit à un "nouvel" abandon et a renouvelé le besoin de la communauté de devenir gardienne de l'histoire et de la mémoire, soulignant également le rôle stratégique des organisations bénévoles dans la promotion de la jouissance et de la compréhension du patrimoine culturel.

L'inertie des institutions locales vis-à-vis des actions de protection active et de valorisation a également favorisé des processus épisodiques de resignification des lieux. Ces dernières années, en effet, les ruines sont devenues un théâtre occasionnel d'exercices et d'entraînements pour les unités de pompiers et de protection civile[20], dans le but de simuler des activités visant à vérifier la praticabilité, la récupération, la conservation, le catalogage et le transport du patrimoine culturel et la formation du personnel sanitaire volontaire.

[18] Montanari, *Privati del patrimonio*, 127, 131.
[19] Art. 2, *Convention de Faro*.
[20] Voir "Protezione Civile".

La reconnaissance des traces du séisme comme valeurs à partir desquelles commencer les expériences et les activités de formation à l'intervention d'urgence montre que ces témoignages de l'histoire et de la mémoire peuvent être chargés d'une nouvelle signification sans annuler les valeurs identitaires du passé, et sauvegardés de l'oubli par l'attribution de nouvelles significations qui les lient au présent. La "renaissance" de ces lieux peut donc être liée à la possibilité d'imaginer une réutilisation utile à la communauté, de "valoriser" et de conserver une mémoire des lieux liés au séisme à partir de laquelle de nouvelles relations peuvent être construites. D'autre part, les ruines continuent d'être un élément constitutif du paysage et conservent leur valeur identitaire qui nous fait réfléchir sur le lien entre le passé et le présent, mais les nouvelles significations attribuées établissent une sorte de relation de continuité entre l'ancien et le nouveau liée à la mémoire du tremblement de terre qui les a générées.

Conclusions

Si, d'une part, le processus d'abandon imposé par le haut s'est avéré être un besoin immédiat de reconstruction après le séisme, aujourd'hui la poursuite de celui-ci semble être un choix conscient de l'impossibilité de préserver tout le patrimoine survivant[21]. De plus, l'immobilité des institutions qui caractérisait le processus de décision en matière de préservation et de restauration résiste encore aujourd'hui. Les lignes directrices pour la protection et la conservation ont été largement ignorées, à tel point que dans certains cas, des contextes et des calendriers entiers ont été "tabula rasa". Dans d'autres cas, l'abandon a généré de véritables "villes fantômes", comme Poggioreale, qui conservent encore aujourd'hui intacts les fragments d'une identité brisée. Dans d'autres, comme dans le cas de Santa Margherita, le désir de préserver partiellement le tissu historique ne s'est pas traduit par des actions concrètes visant à faire revivre les lieux et à réparer les relations interrompues par le tremblement de terre.

Les cas examinés montrent donc que le rappel du principe de la responsabilité culturelle ne suffit pas à interrompre le processus d'abandon. Il faut des politiques et des stratégies collectives qui déclenchent un processus de redéfinition des lieux par la reconnaissance des valeurs culturelles et de la mémoire, ainsi qu'un nouveau regard visant à la valorisation, dans lequel les paysages prennent forme et les relations entre les choses acquièrent un sens[22].

[21] Dal Pozzolo, *Il patrimonio culturale tra memoria e futuro*, 159-166.
[22] Castelnovi, Paolo. *Il risveglio del paesaggio genera rovine*. "Landscapefor".

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L'ABANDON DES VILLAGES EN ITALIE, DEPUIS LES ANNÉES '50 ET '60 À TRAVERS DES CAS EN LIGURIE

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Following the Second World War, a change both fast and radical occurred in the lifestyle in Italy as well as the rest of Europe. The ancient rural civilisation faces a critical crisis, as it gets replaced by an increasingly urbanised and industrialised society, where agriculture itself becomes more intensive and mechanised. In this context, pressure to leave rural villages behind became incredibly strong, a pressure also applied by politicians and the media, who painted a picture of the rural lifestyle as outdated and obsolete, the symbol of a poor history they were trying to leave behind. The new model being proposed, imported straight from the United States, was designed to incentivise consumption and industrial production. Between the 50s and the 70s, many rural villages experienced depopulation like never before, which led many of them to complete abandonment. In Liguria, where, historically, rural villages were abundantly scattered on the Apennines, which cover most of the region, this exodus towards industrial and coastal cities was especially relevant. In the last few decades, many historical centres situated both on the coast and in the hinterland, such as San Fruttuoso di Capodimonte and Varzi, launched important projects aimed at renovating the architecture and landscapes of settlements that are barely populated, if not downright abandoned. One such settlement is Velva, situated in Alta Val Petronio, where many abandoned spaces were taken over by the Dispersed Museum of Rural Culture (Museo diffuso della Cultura Contadina).

Keywords: abandon, villages, Ligurie, museum, conservation

En parallèle avec tout ce qui s'est passé dans les autres pays de l'Europe occidentale, les années '50 et '60 du XXème siècle ont représenté en Italie une rupture définitive du modèle de civilisation rurale installé depuis des milliers d'années.

Au début des années '40, les employés dans l'agriculture étaient 8.600.000, alors qu'au début des années '90 ils n'étaient plus que 1.800.000.[1] En 1936 la population vivant dans les centres de plus de 20.000 habitants correspondait à moins de 36% du total, elle avait dépassé 41% en 1951 et elle avait atteint 52,6 % en 1991.[2]

Après la Seconde Guerre Mondiale, le secteur agricole avait fourni un quart du PIB, mais

[1] Cianferoni, R,, Ciuffoletti, Z. e Rombai, L. *Storia dell'agricoltura italiana vo.III L'età contemporanea* Accademia dei Georgofili, Firenze, 2002 p.12
[2] Ibidem, p.11

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

aux années '90, il ne couvrait qu'environ 5%. Par contre, il avait plus que doublé sa production brute vendable.[3]

Ces chiffres montrent très clairement le changement total et même brutal de la manière de vivre, de produire et sa localisation. L'effondrement d'une civilisation s'était produit.

Tout cela ne pouvait avoir que de très lourdes répercussions sur les lieux où une grande partie de la population agricole s'était établie au cours des millénaires, c'est-à-dire les villages. Ceux-ci étaient très répandus et très actifs en Italie depuis l'antiquité et pendant tout le moyen âge et ce jusqu'à l'ère moderne.

De la création des villages à leur abandon

Au but de mieux se défendre, tant des ennemis que des zones marécageuses, les habitants avaient profité de la conformation territoriale de la péninsule italienne, avec les Apennins répartis tout au long de la botte, les Alpes au nord et plusieurs formations de collines.

Ils s'etaient réunis, souvent sous le contrôle et la protection d'un seigneur local, et ils avaient construit leurs bâtiments et les ruelles qui les reliaient, tout en s'adaptant aux caractéristiques du terrain. A l'intérieur du village il n'y avait ni l'espace, ni les autres conditions pour cultiver les champs pour la survie. Ceux-ci étaient hors de la ville et les célèbres fresques du Palais Public de Sienne du XIVème siècle, le montrent assez bien.

Les villages, où un pourcentage important de la population italienne se concentrait, ont subi l'affaiblissement du modèle économique traditionnel, de plus en plus miné par l'industrialisation croissante. Ils ont donc commencé à se dépeupler à partir de la seconde moitié du XIXème siècle.

Cependant, cette première vague d'éloignement des villages, également déterminée par des adversités naturelles, a coïncidé avec un mouvement migratoire croissant vers les pays européens industrialisés et l'Amérique. A la fin du XIXème siècle et dans les premières années du XXème, l'Italie avait le plus grand nombre d'émigrants par rapport à tous les autres pays européens. Ainsi, de 130 000 par an en 1880 ils sont passés à 540 000 en 1901 et à 872 000 en 1913.[4]

Mais l'émigration qui s'est réalisée jusqu'à la fin de la Seconde Guerre Mondiale a vu souvent le retour des habitants qui avaient quitté leurs villages. Une fois rentrés de l'étranger, ils allaient bien volontiers investir dans les terres agricoles.

Cette attitude des émigrants au retour à leur village d'origine a pu se vérifier jusqu'au

[3] Ibidem, p.12
[4] Amore, V. *L'emigrazione italiana agli inizi del Novecento* in www,circolopertinielba.org

moment où le modèle de vie et ses valeurs ont été bouleversés grâce à l'affirmation d'un nouveau modèle de société, basé sur l'industrialisation et l'urbanisation et sur l'agriculture mécanisée et intensive.

La civilisation rurale est finie et un nouveau modèle de vie s'affirme

Ce nouveau modèle, basé sur le consumérisme, a été puissamment poussé par les États vainqueurs de la Seconde Guerre Mondiale et particulièrement par les États-Unis, qui ont imposé leur type de développement.

Les appels du nouveau modèle social, avec ses niveaux de vie beaucoup plus confortables, liés à la forte et rapide industrialisation et à la richesse qui pouvait en dériver, résultaient irrésistibles. Les pouvoirs politiques nationaux et locaux, les médias tels que journaux, radio et télévision (qui avait commencé à se diffuser en Italie, depuis 1954) soutenaient totalement et de façon acritique le nouveau système de vie, identifié avec le progrès et la civilisation qui s'opposaient à la pauvreté et au retard paysans. Tous les messages étaient bien clairement visés à éloigner les paysans de leurs villages pour les rendre des ouvriers, une main d'œuvre dont toutes les entreprises avaient une nécessité tout à fait urgente !

Ce pressant appel et l'imposant exode qui en est suivi, se sont accompagnés d'une lourde dénigration qui contraposait la nouveauté, la beauté, la richesse de la nouvelle civilisation moderniste au retard, à la misère et à la pauvreté de la société rurale.

Le nouveau modèle de vie qui va de plus en plus s'imposer grâce aussi à tous les médias, est très favorisé par les souffrances vécues à cause de la guerre et par les difficultés énormes de l'après-guerre. Dans ce contexte il est très facile de montrer la ville, avec ses grandes routes, ses voitures, ses magasins qui s'imposent sur les décombres de la guerre, telle que le nouveau Paradis. Un Paradis où il est possible d'être enfin libérés du pénible et dur esclavage de la terre et de toutes ses incertitudes, pour aboutir à un salaire fixe, sûr, qui permet d'habiter des appartements petits, mais doués des conforts tels que l'eau courant et l'électricité.

Par rapport à tout cela la vie dans les petits villages, dans des maisons vieilles et très rustiques, méprisées par la propagande dominante, n'apparait pas du tout attrayante !

L'énorme patrimoine de la culture paysanne et les Musées qui la racontent

C'est précisément à ce moment crucial de la transition qu'un immense patrimoine d'outils et de mobilier du monde paysan a été dispersé ou délibérément détruit, en tant que signe de la pauvreté passée. Confrontés à cette situation, des anthropologues, des historiens, ainsi que des antiquaires et des brocanteurs, sont intervenus pour sauver une partie de ces témoignages matériels d'une civilisation millénaire.

Fig. 1
Chaudron pour préparer le fromage du Musée de Cassego.

Fig. 2
Village de Velva, haute vallée Petronio.

Ces premières collections sont à l'origine des musées ethnographiques, souvent enrichis de nombreux témoignages immatériels. Il s'agit d'entretiens avec les protagonistes de ces expériences superficiellement dénigrées et écartées par le nouveau pouvoir médiatique.

En Ligurie aussi (où la concentration de villages abandonnés est très importante), les premiers musées consacrés à la culture paysanne sont issus de ces premières collections, telles que celle du petit village de Cassego (Commune de Varese Ligure, province de La Spezia) (Fig. 1), collectée depuis les années '60 du XXème siècle par le curé de la paroisse, Don Sandro Lagomarsini. Ce musée a réuni autour de soi un groupe d'enseignants issus de l'école primaire jusqu'à l'Université, ainsi que des chercheurs et des gens passionnés par la culture paysanne. Il a représenté un modèle pour tous les autres, créés depuis la fin des années '70 en Ligurie. Parmi ceux-là, un Musée Diffus de la culture paysanne s'est installé dans le village fortement dépeuplé de Velva (Commune de Castiglione Chiavarese, province de Gênes), à l'intérieur des ateliers historiques de la vie rurale, Jusqu'au milieu des années '50, dans ces mêmes locaux, il y avait des charpentiers, des charretiers, des tonneliers, des forgerons, dont le dernier a cessé son activité en 1962.

Ici les contrats de métayage ont existé jusqu'à la première partie des années '50: il nous en reste un stipulé en 1952, pour une durée de trois ans. Grâce à ces contrats, les châtaignes et d'autres fruits ont été partagés. Depuis le début des années '50, il y a eu une vente massive de bois de châtaignier pour le tanin, vendu à une entreprise de Sestri Levante.

Jusqu'à l'après-guerre dans les villages et dans les lieuxdits dispersés dans ses alentours, il y avait environ 400 habitants. A partir de cette période, ils ont commencé à quitter de plus

en plus le pays, attirés par les industries de la côte. Beaucoup d'entre eux étaient des métayers des grands propriétaires Del Re et Navone.
D'autres ont abandonné leurs propres maisons et leurs terres. Le pic d'abandon a été enregistré aux années '70, période marquée par l'abandon total des campagnes, tandis qu'à partir des années '80 et '90, il y a eu des cas de retour dans les maisons laissées vides, mais sans y résider de manière permanente.

Le cas de Velva de Castiglione Chiavarese

Aujourd'hui dans le village de Velva (Fig. 2) il n'y a qu'une dizaine de résidents stables, qui arrivent autour de 50 en été et pendant les weekends de la belle saison. La plupart des lieux-dits dispersés autour de Velva sont maintenant en ruines, à l'exception de Zuccarella, où une famille vit en permanence et trois autres y passent l'été. Par contre, tout au long de la route qui passe à côté du village, une série d'anciennes et récentes villas sont habitées pendant presque toute l'année. Le nombre total d'habitants de toute la paroisse de Velva s'élève donc à une centaine.
Si jusqu'aux années '50 il y avaient dans ce village deux magasins d'alimentation et deux tavernes, il n'en reste aucun actuellement, ni ici, ni dans ses environs.
Une auberge a été récemment ouverte, construite à l'intérieur d'une maison paysanne qui marquait l'entrée du village historique, comme il est encore indiqué par un panneau. (Fig.3)
Malheureusement, aucun élément de son architecture rurale traditionnelle a été préservé, avec pour résultat le détournement d'un site qui avait jusqu'alors conservé, malgré son abandon, tout le charme que son passé lui avait donné et qui constituait une incitation à visiter ce qui apparaissait immédiatement comme un village rural. L'ancien bâtiment, avant la restructuration déformante, présentait une écurie au rez-de-chaussée et des plafonds caractérisés par des poutres en bois. Tout cela a disparu. L'espace environnant a été profondément modifié par la construction de trois murs en béton armé, réalisés pour soutenir une terrasse, qui a remplacé l'espace vert autour de la maison.
Un exemple d'architecture rurale a été radicalement modifié, en lui faisant perdre toute trace de son passé et de sa valeur. Des atouts que le nouvel exercice commercial aurait pu utiliser pour qualifier son image et offrir à ses clients une valeur ajoutée de beauté, d'histoire et d'anthropologie.
L'image historique a maintenant été remplacée par un bâtiment en série, entouré de béton et de volets en aluminium, qui ne fait que souligner l'inexpérience et l'insensibilité de ceux qui l'ont conçu et de ceux qui l'ont autorisé sous cette forme.

Fig. 3
Maison rurale bouleversée à l'entrée du village historique de Velva.

Il ne reste plus qu'à espérer que l'exemple ne sera pas suivi par d'autres dans le village. La multiplication de cette déplorable valorisation rendrait vain le grand engagement de faire de Velva un musée généralisé de la culture paysanne, un lieu privilégié où celle-ci est avant tout préservée, visible, protégée et ainsi merveilleusement valorisée.

Le Musée diffus de la culture paysanne de Velva: un moteur pour la revitalisation du village

Heureusement, toujours à Velva, il y a eu des cas très positifs de restauration d'anciens mais qualifiés batiments du village. Ce sont les descendants des vieux propriétaires qui ont récupérés et réutilisés ces immeubles, avec la volonté de se relier à leurs origines et de s'insérer dans un projet de valorisation générale de Velva. Ce projet, porté depuis des dizaines d'année par le Musée communal de la culture paysanne, a été diffusé dans plusieurs locaux historiques, à partir du vieil Oratoire de la Vierge Immaculée, qui constitue le principal site expositif et le point focal du Musée et du village tout entier. (Fig. 4)
Un accord avec la Paroisse de Saint Martin de Velva et d'autres avec des propriétaires d'espaces déjà consacrés aux habitations et aux activités de la vie rurale (notamment ceux de la famille de grands propriétaires terriers Del Re, y compris leurs maisons de

famille avec les caves et les dépôts pour les denrées alimentaires), ont créé les conditions pour la réalisation et l'extension du Musée. Il nous permet d'entrer dans la civilisation rurale typique de la Ligurie Orientale et représente aussi un remarquable centre de recherches, d'études et de formation. Ses partenariats sont multiples: il a tissu des conventions avec les écoles primaires et secondaires de la région, une collaboration avec le Laboratoire de Dendrochronologie de la fondation « Museo Civico di Rovereto».

Parallèlement il a donné lieu à la publication d'une série de recherches, réalisées par le fondateur et directeur du Musée, Fausto Figone, issues de sources documentaires et orales, sur des aspects historiques et anthropologiques de la haute vallée Petronio, là où le village de Velva est situé.

L'avenir du village est étroitement lié au sort du Musée. Celui-ci envisage d'amplifier ses espaces grâce à de nouvelles acquisitions et de valoriser son patrimoine au moyen du financement du projet européen Interreg Maritime «Racines», auxquels s'ajoutent des interventions de restauration financées par le Ministère de la Culture italien.

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THE S. APPIANO PIEVE IN BARBERINO VAL D'ELSA (TUSCANY, ITALY): RESTORATION AND ENHANCEMENT FOR A SUSTAINABLE REUSE

Sara Garuglieri, Valentina Puglisi
Università degli Studi di Firenze-Italia

Mastrodicasa C. (2019), Drone View of Pieve of Sant'Appiano in Barberino Val d'Elsa.

The proto Romanesque Pieve of Sant'Appiano, located in the municipality of Barberino Val d'Elsa-Tavarnelle, is one of the oldest and historically most interesting architectural complexes in the province of Florence.
Its millenary history is rooted in the Etruscan and Romans settlements that dotted Monteloro Hill. In the centuries, whose medieval structure has been affected by collapses, reconstructions and transformations over the centuries, was erected. All this construction activity, today offers the visitor a monument of great spatial complexity and interpretative difficulty.
The goal of the work presented here was to set ethically correct design choices that would allow interventions conscious and consistent on the historical construction, avoiding excesses and arbitrary decisions.
For this purpose, it was necessary to try to decode the complexity of the historical stratifications above described, using the technical tools and analytical methods available today to reach an adequate level of knowledge of the building.
The design choices then made will allow the rebirth of the complex into a brand new historical chapter, and the inclusion of this Romanesque jewel in the touristic circuit linked to the Via Francigena, which, in all probability, was the real engine of its birth and prosperity.
The reuse plan will allow obtaining large spaces to be used as guest quarters for devotional "slow tourism" linked to the Via Francigena and, at the same time, it will consent to create new social activities related to the culture and food and wine of the area.

Keyword: Restoration; Sustainable reuse; Enhancement; Financial sustainability; Francigena.

Introduction

The present research has been done for the Specialization Course thesis in Conservation of Architectural and Landscape Heritage (DiDA – UNIFI), entitled "The Pieve of Sant'Appiano in Barberino Val d'Elsa. Restoration and sustainable reuse"; the dissertation was presented in December 2019, Supervisor Prof. Arch. Maurizio De Vita and Assistant Supervisor Arch. Claudio Mastrodicasa.

Italy is worldwide renowned for its immense cultural heritage; a large part of this heritage, however, is not adequately resourced and promoted to meet its full cultural and touristic potential. It's the case of the proto romanesque Pieve of Sant'Appiano, a jewel set harmoniously in the Tuscany landscape, among the Val d'Elsa hills, few km away from the Francigena Route.

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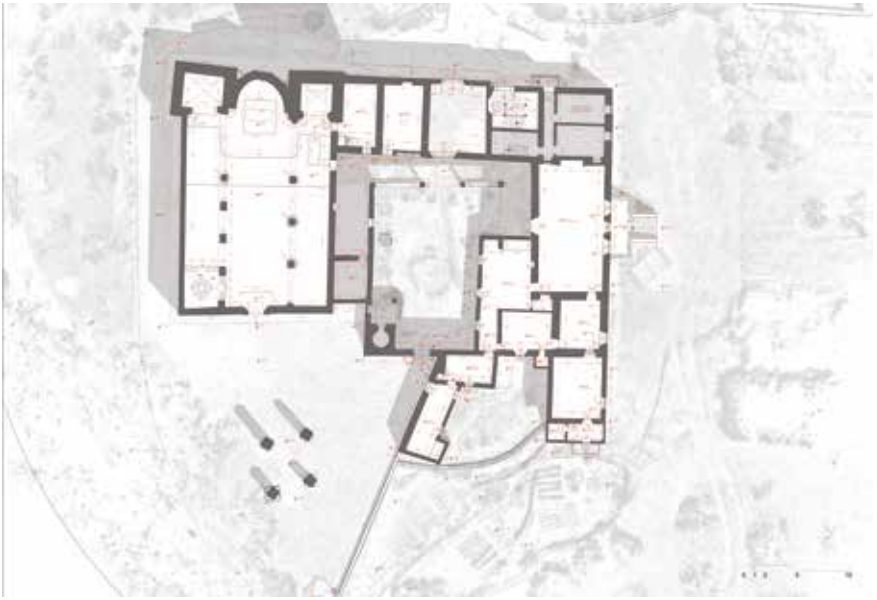


Authors (2019), Digital survey, Ground floor plan.

Authors (2019), Digital survey, Section.

Very well known by art historians and archaeologists, its touristic role is by contrast very marginal, relegated as target for locally organized tours or for a few niche visitors.
Moreover, the absence of any permanent custody staff gives the non-organized tourism just the opportunity to appreciate the exterior of the monumental complex.
This jewel of 'minor' holy architecture has been kept alive until today thanks to the care of Bishop Ferradino Fiorini (since the '70s of XX century) and to the initiatives fostered by the parish priest Father Slawomir Bogutyn (familiarly known as Don Soave) together with his religious community and the local cultural associations, by organizing in the Pieve area small touristic activities and cultural events.
This way, the Church, the Salone dei Cento (the Hall of One-hundreds), some rooms of the Rectory and the Antiquarium facilities are periodically in use, while some of the Pieve most interesting internal spaces, like the Chapter House and the amazing Wine Cellars from XV Century, leading to two Etruscan Tombs, are still underutilized or in state of neglect.
Another sore point is the presence, on the northeastern corner of the complex, of a two-story residential unit rented to private tenants, severely altered in its original structure and today completely inaccessible.

The attractiveness of this architectural complex and its tourist-receptive potential are disproportionally high in relation to the actual use. The church ant its outbuildings, especially the eastern wing of the complex, which is the most neglected portion, would highly benefit from tailored conservation and sustainable reuse interventions aimed to give back charming spaces to several visitor's targets, thus recreating the complex 'original grandeur.

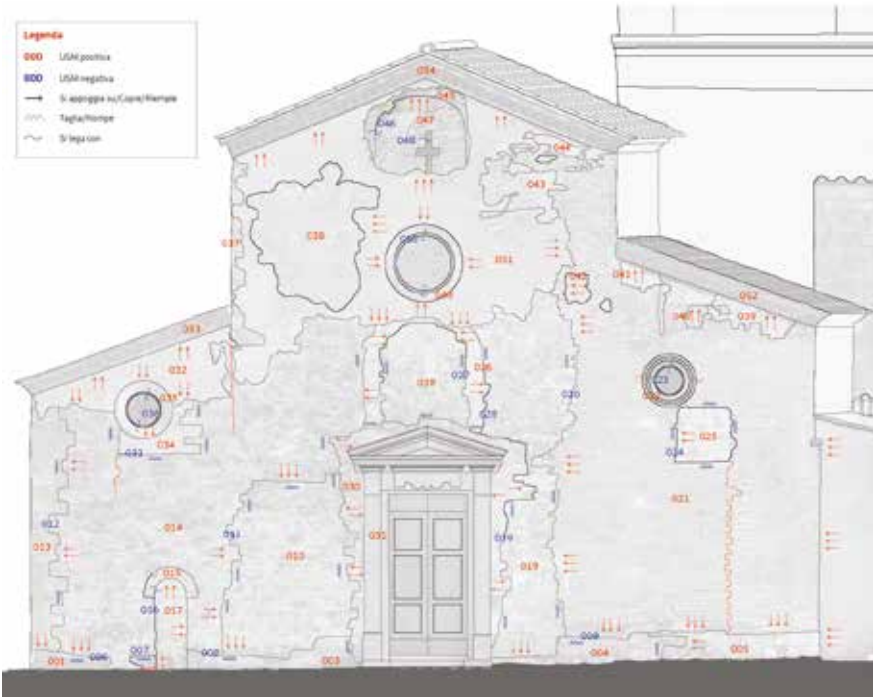
The Pieve of Sant'Appiano, with its cultural heritage and the several values that embodies, is transversal to the 'thematic tourism' itineraries: here visitors interested in historical-artistic, architectural, religious, naturalistic, eno-gastronomic journeys could easily cross their paths.

From the perspective of a compatible profitability of the Cultural Heritage, aimed to self-financing, the Pieve of Sant'Appiano can display several viable opportunities to intercept a substantial demand in touristic market segments still unexploited, meanwhile financing the daily management and ordinary maintenance of the complex, with positive spillover effects in the mid-long period.

The author's objective has been, thus, to investigate possible touristic development scenarios for the Pieve, synergetic with the actual stakeholder's needs and economically self-sustainable, hoping to attract public and private investors to foster a brand-new life for this architectural jewel.

Setting the knowledge plan:

In order to set a holistic conservation project for the whole Pieve complex, and in the perspective of making correct choices for the reuse of some of the outbuildings portions while



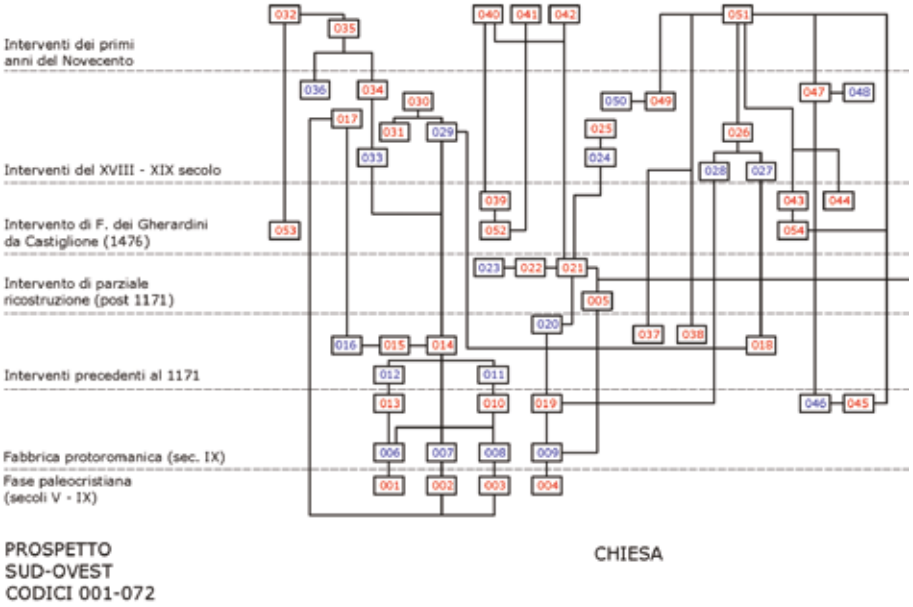
Authors (2019), Analysis of Stratigraphic Units and Harris' Matrix.

applying the 'minimum intervention' criterion, the knowledge of the building has a crucial relevance.

A careful knowledge plan to investigate the architectural and archaeological assets, and the stratifications that have taken place over the centuries, is the corner stone of a correct interpretation of the testimonial values of the monument's history, and the key to keep narrating this history nowadays.

Therefore, the research work has been organized first with a careful study of the wide reading list available on the Pieve, mostly dating from the second half of XIX century and the 70s of XX century, then with an accurate research in the Historical Archives of the Soprintendenza Archeologia, Belle Arti e Paesaggio of the provinces of Firenze, Prato and Pistoia. There, the available documentation was not enough complete to allow the reconstruction of the whole picture of the interventions carried out during the last 150 years.

So, the information gathered on the historical transformations of the ancient buildings have been critically confronted with the direct analysis of the architectural features of the complex, to verify the reliability of the data and to attempt an hypothetic decryption

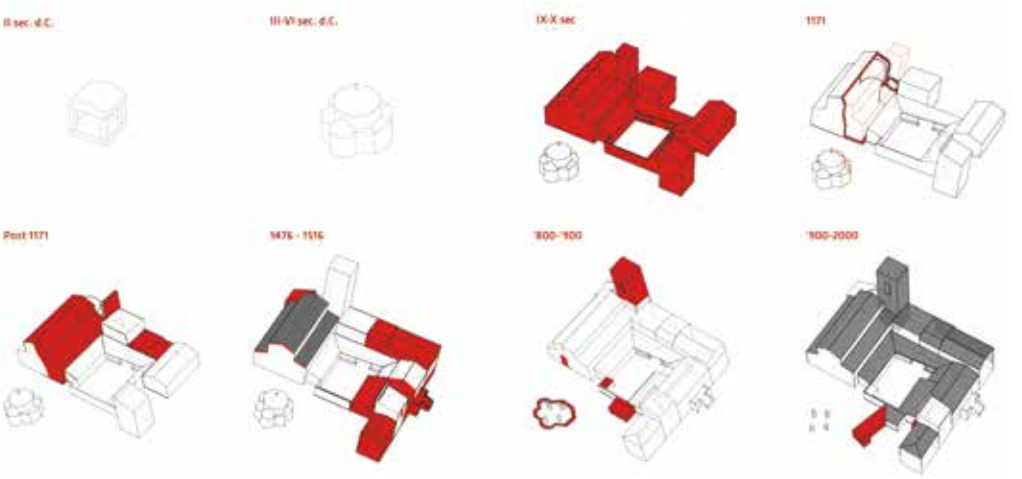


of the historical phases not yet fully investigated in this composite architectural palimpsest.

To improve the general knowledge level of the complex, in June 2019 an extensive digital survey campaign has been held, in order to gather morphometric data (through the range-based equipment Laser Scanner Faro® Focus 3D X 130), and chromatic data (through image-based techniques using a Nikon D610 Camera). The 3D point cloud obtained has been then elaborated in order to have 2D color representations achieved thanks to the combination of two softwares: Leica Cyclone 6.0.3 and Agisoft PhotoScan. These 2D representations show with great accuracy the constitutive materials and the building techniques for each internal and external façade

Based on the historical and morphometric data, the stratigraphic study of all the un-plastered facades has been conducted, according to the guidelines given by Prof. F. Doglioni[1] and Prof. G. P. Brogiolo[2], thus allowing a scientific and objective restitution of the wall text, and helping to avoid the stylistic interpretations widely available in the literary sources. Wall Stratigraphic Units have been identified, and their stratigraphic relationships established in

[1]Doglioni, F., Torsello, B. P., & Ciarocchi, M. (1997). *Stratigrafia e restauro: Tra conoscenza e conservazione dell'architettura*. Trieste.
[2]Brogiolo, G. P., & Cagnana, A. (2012). *Archeologia dell'architettura: Metodi e interpretazioni*, Firenze.



Authors (2019), the resulting evaluations allowed making a hypothesis related to the main building phases, resumed by schemes.

order to determine historical macro-phases. The related ICCD Catalogue forms have been also compiled and the Harris Matrix filled.

The proto Romanesque macro phase, (IX-X century), the phase post-collapse of the Bell Tower and of the eastern Church portion (end of XII century) and the transformation phase by Messer Francesco dei Catellini da Castiglione (years around 1476) have been determined. More uncertain are the constructive events of the centuries XVII e XVIII, while precise dating refer to interventions of the XIX century, of whom physical traces are available in inscriptions on stone elements and plaster. Moreover, for the interventions of XX and XIX centuries, the constructive events reconstruction has been referred mainly to the archival data available.

Then, the characterization and record of the wall textures and the study of constitutive materials and building techniques have been carried out.

The integration between the stratigraphic study study of constitutive materials and building techniques made possible to read the built heritage in the most scientific possible way. Eventually, the analysis of the existing decay phenomena according to the directive UNI EN 1182:2006 (former Normal 1/88) completed the complex' surfaces study.

Authors (2019), The Tau symbol: the pilgrim staff.

Towards a sustainable reuse:

As previously mentioned, the number and variety of people that today hang around the Pieve, even though complicit in keeping this place alive, create a mixed and multifaceted

situation that might jeopardize the Pieve and its legitimate status as cultural heritage to be protected and as cultural attraction to be valorized.

Indeed, the Pieve finds itself in an intermediate condition: on one hand it is a monument of great historical and artistic relevance, targeted by niche visitors and art historians; on the other hand it is a parochial center hosting recreational activities for children and private religious events.

New possible use scenarios have thus been investigated in order to keep going the actual activities while meeting the conservative and enhancement needs of such an important complex; in particular, the role of some historically relevant internal spaces must be protected by improper usages, while more adequate spaces can be made available for recreational uses.

Another important aspect that has been considered in the frame of general planning is related to the future financial and management sustainability of the monumental complex, today operating just because of the volunteers that serve as custodians, touristic guides, and maintenance staff and of private sponsors that donate small amounts of money for spot interventions. This system, by nature, does not allow any organic planning, nor for the organization of the needed extraordinary maintenance works, neither for a far-sighted valorization policy able to meet the needs of the cultural heritage and integrated in the territory.

At a planning level, a systemic and integrated approach has been privileged, considering the Pieve of Sant'Appiano just a piece of a wider territorial puzzle.

Authors (2019), the Via Francigena route (in red line) and the Pieve of Sant'Appiano.

Authors (2019), Groundfloor Plan Detail: Guesthouse project.

Based on the Pieve's characteristics and vocation, the territorial context and social system have been analyzed through a SWOT Analysis; then, the thematic touristic trends, the actual and potential touristic demand (targeting) and the activity of possible local competitors have been investigated through sector inquiries.

Today, the touristic policies at a national[3] and European level, aim to promote the transnational sustainable tourism through creating thematic itineraries able to link people and places tied to each other by a common cultural heritage. [4]

Originally, the Pieve was built along one of the routes privileged by Florentines to go to Rome, named 'roman route', or, as defined by Paolo Guicciardini, 'southern Volterrana route'.

Crossing San Casciano and Tavarnelle (Pieve of San Pietro in Bossolo), this road reached Barberino entering the Valdelsa and eventually met the via Francigena between Certaldo and Poggibonsi, through a bundle of roads fanning out and getting to the Pieve of Sant'Appiano and Linari, to Pastine and Vico and to Poneta.

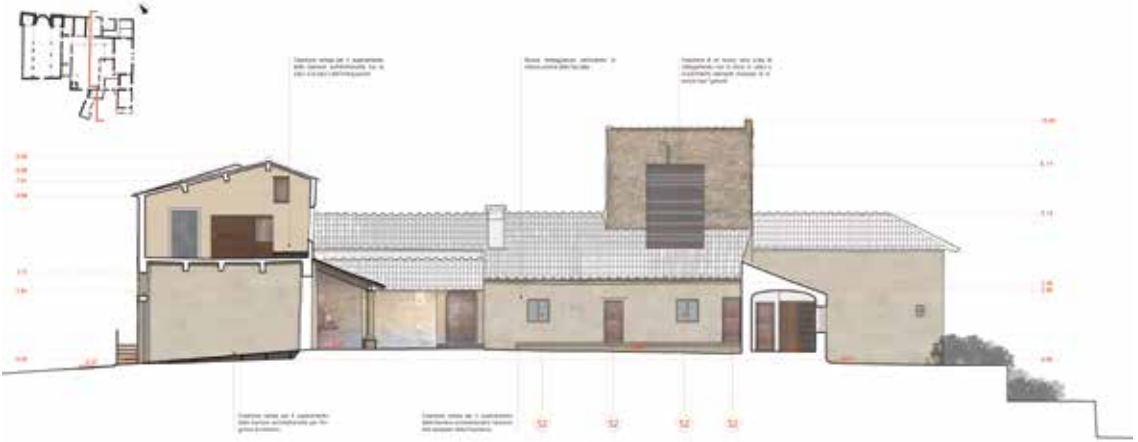
[3] 2019 has been the 'slow tourism' year, a new trend that has become an opportunity to re discover and enhance the less known Italian touristic places by the international tourism. Martellotta, M., *Turismo lento: il 2019 è l'anno nazionale*, in www.architetturaecosostenibile.it;

[4] 4 Since 1954 the Cultural Itineraries of the European Council have been established as tools of the cultural European cooperation adopted through the "Cultral European Conventio". The Via Francigena is one of such itineraries, certified since 1994. European Council, *Gli itinerari culturali del Consiglio d'Europa*, in www.coe.int;

Thanks to its location, the Pieve of Sant'Appiano represented since the antiquity a pilgrimage destination, as witnessed by the symbols available on the capitals of the lost Baptistry. To the authors, this pilgrimage vocation could represent the *fil rouge* between past and future.
The check of potential local competitors between the Municipalities of San Gimignano, Colle Val d'Elsa, Barberino Val d'Elsa and Poggibonsi, as expected, revealed that the majority of tourist accommodations is located in San Gimignano and, however, close to historical villages. Anyway, very few accommodations meet the needs of pilgrims, that is to say 'low cost' accommodations or 'free offer' religious hostels.
Besides, the network of accommodation facilities along the Via Francigena is not punctual and cheap as the one established along the Santiago Route; for this reason, the development of facilities linked to the 'slow tourism' towards Barberino Valdelsa could prove to be a winning choice, given the absence of such facilities in the surroundings.
In light of the results obtained, the reuse choice to be pursued has been that of re-using some of the complex spaces as guesthouse for the pilgrims (Rectory) and as banqueting and event hall (wine caves), also integrating the Antiquarium itinerary and the visit to the Salone dei Cento and to the Etruscan Tombs.
Then, new management opportunities have been evaluated: being the Pieve property of a religious institution, the *no profit* model has been chosen as the best one, reinvesting the possible income surplus in the conservation and valorization of the Pieve itself.
A cost-benefit analysis confirmed the selected model and established the principle of avoiding any kind of assignment (rent, sale) to private subjects, thus keeping the full control on the whole property. All the spaces should be defined with clear, unmixed functions; at least one personnel unit should be regularly hired for the guarding service and guest's reception; the creation of the brand, together with an effective communication and promotion strategy, could lead to a successful insertion in the local touristic offer.

The Pieve di Sant'Appiano as a new *slow turism* destination:

In order to reach the above-mentioned objectives, it is unavoidable the completion of some conservative and architectural interventions on the historical buildings, aimed to meet distributive necessities and contemporary functionality needs related to the spaces dedicated to hospitality, to touristic visits, and to the cultural events, such as the removal of architectural barriers and the put in place of fruition strategies dedicated to people with special needs.
The ancient grandeur of internal and external spaces will be restored using finishing materials compatible both on the conservative and philological – aesthetical point of view.



Authors (2019), Functional scheme and operating hour.
Authors (2019), Section or view of the new staircase.

The only substantial transformation of the complex' facades layout is represented by the insertion of a new volume in the Eastern Tower, towards the Cloister, hosting a new staircase linking the first floor of the Tower to the rest of the building, today accessible only through a trapdoor. The casing is planned to be built in glass framed by terracotta elements, in order to maintain a certain transparency and to recall in a modern way the terracotta elements characterizing this complex during the XII century phase.

Conclusions:

The historical research and the study of the territorial context in which the ancient Pieve of Sant'Appiano is located have been crucial to find a viable way leading to successful reuse, management and self-financing strategies.

To this respect, the design proposal foresees a possible sustainable reuse scenario able to meet the most genuine needs of this monument, inserting it in a consolidated touristic circuit, still to be developed and enhanced with the creation of new itineraries along the via Francigena. At the same time, the proposal will allow to improve the actual religious and social functions of the complex, implementing new hospitality facilities to host the historical, cultural and religious pilgrims; the ancient caves will be re-opened to host events linked to classical music, culture and eno-gastronomic events in order to ensure the monument the financial sustainability necessary to avoid a new phase of decay.

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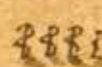
Spiegazione delle diverse marche

 Alberi d'oliva

 Filagnate di Vigna

 Alberi di Castagno

 Piante di Roveri, e Cerri

 Pini Selvatici

Cipressi

 Case

 Case rovinate

 Fornaci di Calcina

 Termini, e linea di Confine

 Cisterne

 Pozzi

 Strade, o Stradelli

VILLAS, BÂTIMENTS RURAUX ET ARCHITECTURES MILITAIRES ENTRE ABANDON ET RÉCUPÉRATION: L'HABITAT HISTORIQUE RURAL DISPERSÉ DE L'ÎLE PALMARIA (LA SPEZIA - ITALIE)

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G. Brusco, L'Isola Palmara divisa nelle Tenute delli Particolari, 1790, détail : la légende. La Spezia, Bibliothèque "U. Mazzini", muro 6, 2DR11.

Palmaria Island, the largest of the small islands of the Ligurian Sea (1.89 km2) is an interesting case study, for having crossed the season of intense building speculation that has affected the coast of Liguria since the post-war period. This "distraction" is due in part to military easements and in part to the territorial protection exercised by the population of the Gulf of La Spezia which has preverted the construction of hotel settlements with a strong environmental-landscape impact and the massive spread of second homes. It's not a casuality that the island, due to its naturalistic and landscape heritage, has become part of the UNESCO heritage.

Our research it's about reconstruction of the original characteristics of the historic settlement, result of a succession of very different territorialisation phases. Without linger on the medieval age, when a inhabited nucleus – of which only traces remain – was located on the island, we can recognize:

1. a long period of intense cultivation of the terraces, well highlighted in the cartography of the late 18th century, with the corollary of a very dispersed settlement of small rural buildings;
2. the period of the spread of military artifacts as a consequence of the defense role of the Gulf assigned to the island during the nineteenth century and beyond;
3. the phase of exploitation of the *Portoro* marble, linked to the construction of modest-sized quarries;
4. the most recent affirmation of a "light" and essentially day-to-day tourist use.

As for the settlement, there were different and sometimes opposite trends, regarding the abandonment of most of the agricultural artifacts and the different fate of the two remarkable and rare examples of stately mansions: villa San Giovanni, (sixteenth-century origin), and villa Smith (nineteenth-century foundation). The first in good conservation conditions; the second in total ruin. The same happened to military artifacts.

This work aims to offer a periodization of the aforementioned territorialisation phases – on the basis of field surveys and analysis of the archival sources available (written and iconographic) – and, at the same time, show a geographical-historical research methodology applicable to the study of settlements.

The study is also offered as food for thought considering the important urban projects now underway.

Keywords: rural heritage; military heritage; historical cartography; dynamics of abandonment; tourist transformation.

Préface

L'Ile Palmaria est l'île principale du petit archipel situé dans le Golfe de la Spezia, inséré depuis 1997, avec l'ancien bourg génois de Porto Venere et les Cinque Terre, dans la liste du patrimoine mondial de l'UNESCO. Elle est aussi la principale des îles liguriennes qui

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

comprennent, outre Palmaria, Tino, Tinetto et, le long de la côte du Ponent de la région, Gallinara et Bergeggi. La Palmaria est la seule à avoir eu une population stable et durable, même si actuellement très limité : 32 habitants sur une surface de 1,89 km².
L'île est le prolongement géographique et physique de la presqu'île dont la pointe est occupée par l'ancien bourg génois de Porto Venere auquel la Palmaria est rattaché pour les institutions qui l'ont gouvernée et la gouvernent et pour les activités qui y ont été effectuées : agriculture, pêche, excavation du marbre « portoro » qui constitue la charpente de l'ensemble. De la terre ferme, la Palmaria a également répliqué la fonction défensive « naturelle » - en raison de sa position stratégique à l'embouchure du Golfe - et la spécificité des paysages, soulignée par les écrivains et les peintres de l'âge romantique,-précurseurs d'une importante , du point de vue qualitatif, tradition touristique (Marcenaro, 1994).
La présence de la Marine militaire italienne (qui dans la seconde moitié du XIXe siècle et dans la première moitié du XXe siècle a soustrait aux usages civils une partie importante du territoire de la Palmaria et presque totalement celui de la plus petite île du Tino), associée au désintérêt pour un lieu en hiver mal relié à la terre ferme et à la vigilance de la population locale ont, ensemble, accompli le miracle de faire sortir presque indemne l'île de la « Grande Trasformazione » responsable du bétonnage d'une bonne partie de la côte ligure. Elle est arrivée à nos jours avec un héritage historique et environnemental considérable.
Pour son patrimoine paysager, dont la formation et l'évolution est attestée par une documentation cartographique couvrant sans interruption les XVIIIe et XIXe siècles (Rossi, 2008b), la Palmaria représente le lieu réel et idéal pour une réflexion sur les dynamiques de l'abandon et (du point de vue du respect des valeurs paysagers), de la correcte récupération du patrimoine rural et militaire en cours dans notre Pays, non seulement dans les zones internes mais aussi dans des contextes côtiers célèbres (Gemignani et Rossi, 2019).

Processus de territorialisation à travers les sources cartographiques et documentaires

Le territoire de Porto Venere est caractérisé historiquement par la présence d'un port remontant à la domination de l'ancienne République maritime génoise. Cet élément, associé à la présence de la route carrossable construite au début du XIXe siècle par les ingénieurs napoléoniens, a contribué à lui donner une importance urbanistique et architecturale considérable. L'île Palmaria a été touchée au cours des siècles par de nombreuses expropriations militaires visant à la construction de fortifications érigées pour

défendre le Golfe de la Spezia. L'occupation militaire du milieu, bien que dominante dans la dernière phase historique, n'est cependant pas le résultat de l'unique vocation de l'île, comme en témoigne la présence actuelle de bâtiments de différents types fonctionnels : villas historiques, maisons rurales, modestes bâtiments industriels, infrastructures touristiques d'usage essentiellement local. Ces données matérielles, qui au fil du temps ont souvent changé leur fonction d'utilisation, renvoient à un palimpseste paysager complexe qui émerge de sources historiques différentes par époque et par typologie. L'île - et plus en général tout le domaine territorial de Porto Venere - a eu la chance de devenir théâtre d'une série d'opérations topographiques (majoritairement à très grande échelle et à l'avant-garde du point de vue technique) qui nous permettent d'en lire les transformations dans les moindres détails et même de détecter des évidences et des criticités des phases d'abandon du paysage rural local. (Fig. 1)

La carte dessinée en 1790 par l'ingénieur génois Giacomo Brusco[1] donne une centralité absolue à ce dernier. C'est à lui que renvoie avec précision l'appareil symbolique rappelé par la légende : «Oliviers, *Filagnate di Vigna*, Châtaigniers, plantes de Chêne et Chênes chevelus, Pins sauvages » ainsi que « Cyprès », très rares sur la côte ligure. Un long panneau latéral [fig. 1] enregistre les caractéristiques des terrains : noms des propriétaires, taille, l'espèce de culture de chaque parcelle avec indication des associations (« Vitato e Campivo », « Olivato, Vitato »), surface occupée par les bâtiments.

La carte de Brusco doit être comparée avec le *Libro Delle Denunzie dei Stabili*, réalisé en 1798 sous la République Ligurienne (1797-1805) lorsque la « commune démocratique » d'époque révolutionnaire de Porto Venere décida le recensement de toutes les propriétés immobilières locales. Ce document de caractère descriptif, compilé sur la base des dénonciations des mêmes propriétaires et usufruitiers de terrains et de bâtiments, contient trois registres séparés, *l'État de section* (sur lequel nous ne nous arrêterons pas), la *Description des terrains* et la *Description des maisons*[2]. Pour chaque terrain recensé sont enregistrés la valeur, la localisation, les noms des propriétaires des parcelles limitrophes, l'utilisation du sol et la présence d'annexes construites. Les types d'utilisation du sol rapportés sont : potager, terre plantée de vignes, terre plantée d'oliviers, terre fruitière, terre semée, terre plantée de châtaigniers, terre herbeuse, terre boisée et terre inculte, forêt de pins, forêt de taillis, bois chêne et bois de châtaigniers. Le registre de la *Description des Maisons* contient des informations sur

[1] G. Brusco, *L'Isola Palmara divisa nelle Tenute delli Particolari Possidenti colla Cannellazione, e specie di Coltura contenuta nelle medesime*, 1790, échelle approx.1:1300, Biblioteca Civica "U. Mazzini", La Spezia, muro 6, 2DR11; voir La Ferla, 2007.

[2] *Libro Delle Denunzie dei Stabili della Municipalità di Porto Venere*, 1798, Archivio Storico del Comune di Porto Venere, Archivio dell'Antico Comune, 212,

Fig. 2
Villa S. Giovanni. Photo C.A. Gemignani, octobre 2009.

les agglomérations urbaines présentes sur le territoire de la Municipalité et se concentre donc sur le bourg de Porto Venere : dans ce cas également, des informations sont fournies sur l'emplacement de chaque bâtiment et sur les propriétaires limitrophes.
A travers ces documents l'île, comprenant 119 parcelles pour 37 propriétaires, se révèle être cultivée surtout le long de sa côte septentrionale (celle qui regarde Porto Venere). La plus grande quantité de parcelles se concentre dans les localités du Terrizzo (indiqué sous le nom de Terisso, Tericcio ou Terriccio), de Villa San Giovanni et du Monte. Le reste de l'île est principalement recouvert d'un manteau boisé entrecoupé de rares zones cultivées, comme celles du Roccio, du Pozzale (enregistré comme Pozzallo) et du Schenello, situées sur la côte sud de l'île. Une fois de plus, la vigne et l'olivier sont les cultures les plus répandues, présentes soit en monoculture, soit en culture mixte. La vigne est cultivée en 37 parcelles, dont 13 à monoculture. Les autres parcelles présentent des cultures mixtes : dans dix cas le vignoble est associé à des terres arables et dans cinq on trouve la vigne avec les figuiers. L'olivier est présent sur 25 terrains : neuf fois à monoculture, treize avec la vigne et d'autres arbres dont se distingue le châtaignier. Pas moins

de 46 des terres réparties sur la superficie de l'île sont laissées en forêt : il s'agit par ailleurs des plus étendues. L'arbre le plus répandu dans ces derniers se révèle être le pin, même si on enregistre la présence de châtaigniers, de chênes et de quelques solitaire cyprès.

La *Denunzia* fait état de l'existence de différents types de bâtiments : 18 au total. Il s'agit pour la plupart de maisons rustiques pour paysans et métayers, d'un magasin et d'une étable mais il y a aussi la maison de maître (Villa San Giovanni). Au total, quatre bâtiments sont inhabités ou détruits. L'existence de maisons délabrées, comme de terrasses d'oliveraies et de vignobles menacés par la forêt ou en état de semi-abandon, témoignent de la diminution de l'activité agricole sur le territoire insulaire par rapport au passé. Activité entrée en crise avec les expropriations et les servitudes militaires définitivement entamées avec la construction de l'Arsenal de la Spezia (1862-1869), qui fera de l'île une partie du plus vaste système fortifié du Golfe.

Les étapes suivantes de l'évolution territoriale de l'île peuvent être reconstruites en se référant à la documentation cartographique postérieure comme les 18 grandes feuilles de la carte à courbes de niveau de la Brigade topographique napoléonienne commandée par le capitaine du Génie Pierre-Antoine Clerc (Rossi, 2007 ; Rossi, 2008a). La carte, relevée en 1809-1811 (c'est-à-dire seulement une vingtaine d'années après celle de Brusco) à grande échelle (1:1000), et déjà rédigée avec les symboles abstraits de la cartographie moderne, est un document précieux pour compléter les connaissances fournies par les documents qu'on vient de décrire. Elle montre parfaitement le territoire de l'île dans tous ses détails, et en particulier du patrimoine bâti : des maisons de toutes tailles à l'intense réseau des chemins, des murets de pierres sèches, des escaliers qui les lient.

Si les tablettes relevées par le Corps d'État-Major de l'Armée Sarde dans les années Dix et Trente du XIXe siècle sont moins exactes par rapport au travail des topographes français, leur langage, très pictural, contribue à la compréhension du paysage historique de l'île. Notre travail de déchiffrement du paysage de l'île se termine par la prise en considération des premières cartes de l'Institut Géographique Militaire, de la Carte Technique Régionale et de la cartographie satellitaire.

Trois sites, parmi les nombreux qu'il est possible d'identifier, peuvent être considérés comme des exemples significatifs des - opposés - dynamiques en place : Villa San Giovanni; Villa Smith; Forte Cavour. (Fig. 2)

Le complexe de la villa rustique de San Giovanni (Fig. 2) se dresse sur le bord plat d'une petite baie située en face au bourg de Porto Venere. Dans le site se trouvait, à l'époque médiévale, un petit village avec son église (de San Giovanni, précisément). De l'ancien noyau il reste seulement témoignage dans les documents pendant qu'il survécut longtemps la petite

Fig. 3
Brusco, L'Isola Palmara divisa nelle Tenute delli Particolari..., 1790, détail : Villa S. Giovanni et alentours. La Spezia, Bibliothèque "U. Mazzini", muro 6, 2DR11.

Fig. 4
P.-A. Clerc, Lever nivelé du bord et des îles du Golfe de la Spezzia..., 1809-1811, détail : Villa San Giovanni et ses alentours. Roma, Istituto di Storia e Cultura dell'Arma del Genio (ISCAG), FT 64/A et FT 64/B.

Fig. 5
Corpo di Stato Maggiore dell'Armata Sarda, Carta degli Stati di Terraferma..., 1816-1832, détail. Firenze, IGM, Archivio cartografico, 0.28 A.32 D.252.

église ou chapelle à laquelle il s'adjoignit, à la fin du XVIe siècle la villa, rare exemple, dans l'extrême Levant ligure, de ces « villas marines » plus répandues dans le Ponent. Elle a également connu plusieurs transformations (dont l'incorporation de la chapelle), déterminées par les passages de propriété (en 1862 elle fut achetée par le comte Pieri-Nerli) et des différentes fonctions remplies dans le temps : « casino de délices » et résidence seigneuriale, maison du maire, atelier pour la salaison des anchois (localement dit « saladero ») et, actuellement, la multipropriété résidentielle de vacances. Les équipements importants du complexe sont le jardin arrière (du dessin primitif « à l'italienne » restent aujourd'hui peu de traces) et le petit terrain plat adjacent encore cultivé (bien que de façon très marginale) délimité et protégé sur le versant marin par un mur original en pierre avec les typiques piliers en maçonnerie qui soutenaient la pergola. Dans le versant montagneux qui domine la villa, les anciennes terrasses cultivées, sauf des petites parties récupérées, sont aujourd'hui couvertes par la forêt.

Dans la carte de Brusco de 1790 (Fig. 3), on reconnaît bien les zones à l'époque destinées à des usages distincts : jardin, potager, vignoble dans la partie plate et terrasses plantées d'oliviers dans la pente derrière la villa. Cette organisation de l'ancien espace rural est encore plus explicite dans la carte de Clerc (Fig. 4) et dans les tablettes de la *Carta degli Stati di Terraferma di S. M. il Re di Sardegna* (Fig. 5): alors que dans la pente on lit parfaitement la trame des murs à sec qui soutenaient les terrasses. Dans la courte plaine côtière de la villa on remarque un aménagement du terrain qui, dans ses géométries, révèle des œuvres antiques de canalisation imprimées au cours du fossé de San Giovanni qui descendait de la petite vallée arrière. Mis à part les manipulations du bâtiment du XVIe siècle et l'abandon des cultures dans la pente maintenant recouverte de végétation spontanée, le complexe de San Giovanni conserve, pour l'essentiel, son unité et son intégrité. Il ne fut pas compromis par le fait d'avoir traversé au fil du temps des phases différentes de l'utilisation de la villa et de l'organisation territoriale des alentours. (Fig. 3) (Fig. 4)(Fig. 5)

Le site appelé Villa Smith (Figg. 6-8) concerne par contre une courte terrasse côtière donnant sur le bras de mer dit « Canale di Porto Venere » dans la partie nord-orientale de l'île. Le site comprend aujourd'hui cinq bâtiments, tous situés au bord de la mer. L'appellation actuelle est due à Mr. Giovanni Smith qui, dans la seconde moitié du XIXe siècle, fit construire le bâtiment à deux étages puis confisqué par la Marine militaire pour des raisons stratégiques.Près de la Pointe Scola on trouve un bâtiment militaire, architecturalement très intéressant, du XIXe siècle : la « Torre corazzata Umberto I » qui devait neutraliser d'éventuelles offensives maritimes dans le golfe de la Spezia désormais militarisé. Cette fortification a été restaurée il y a quelques années en espace culturel. (Fig. 6)

Villa San Giovanni, Villa Smith et le Fort Umberto I, ainsi que les terrasses environnantes, constituent un patrimoine important, car ils comportent des aspects maritimes et ruraux. En particulier, ces derniers conduisent à l'intense exploitation du territoire environnant, facilement accessible et relativement plat (même s'il n'y avait pas de sources d'eau douce) dédié au vignoble et à l'oliveraie (mais l'élevage n'était peut-être pas exclu). Le mur de pierre qui longe la côte est également itéressant, de nature à conférer au domaine historique (documenté vers 1830 comme « C.sa Remissa [?] ») l'aspect de « jardin muré ». Derrière Villa Smith s'étend également un jardin avec des parterres et des terrasses (aujourd'hui complètement abandonnés). Depuis environ un siècle, dans le miroir aqueux en face se trouvent de nombreuses installations d'élevage de moules qui peuvent profiter du soutenu renouvellement de l'eau par les courantes. (Fig. 7)

Les quatre bâtiments de service et la Villa (qui présente un aspect très simple) sont actuellement en état d'abandon total (Fig. 9), même si jusqu'à il y a quelques années les locaux de la villa étaient loués au personnel de la Marine. Aujourd'hui l'ensemble du complexe est signalé comme « dangereux », les accès sont scellés et envahis par les ronces. Le complexe est inclus dans les biens à titriser. Le risque est donc celui de l'aliénation et d'une restructuration (par ailleurs inévitable) qui peut altérer lourdement la fragile et équilibrée physionomie du complexe, en introduisant des éléments de construction ou « récréatifs » étrangers ou susceptibles de modifier la nature « maritime-rurale du site ». (Fig. 8)

Le sommet est-ouest de l'île est indiquée dans la carte de Brusco comme « Le Plan » (Fig. 10). L'île Palmaria culminait en effet avec un vaste plateau, à l'époque occupé par des parcelles cultivées.

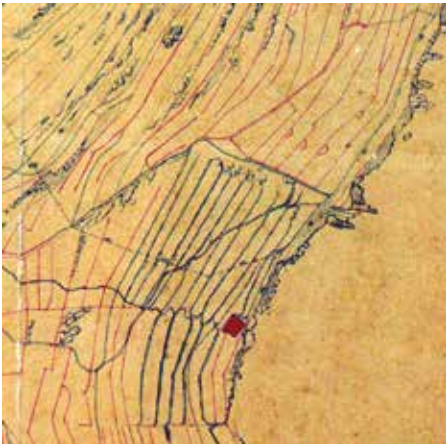
Du plateau descendaient quelques terrasses, toujours cultivées en vignes, avec quelques oliviers dispersés ou des pentes couvertes de « pins sauvages ». Sur la même carte étaient marqués, en outre, environ au milieu du plateau, deux bâtiments dont l'un « ruiné ». Il n'y a plus aucune trace de ce paysage rural. (Fig. 9)

Fig. 6
L'ensemble de Villa Smith. Photo O. Strati, octobre 2009.

Fig. 7
G. Brusco, L'Isola Palmara divisa nelle Tenute delli Particolari..., 1790, détail : le site de Villa Smith. La Spezia, Bibliothèque "U. Mazzini", muro 6, 2DR11.

Fig. 8
P.-A. Clerc, Lever nivelé du bord et des îles du Golfe de la Spezzia..., 1809-1811, détail : Villa Smith. Roma, Istituto di Storia e Cultura dell'Arma del Genio (ISCAG), , FT 64/A et FT 64/B.

Juste au sommet du « Piano » commença le 23 mars 1862 la construction du fort Cavour (Fig. 11) et toute la zone fut soumise à un régime de servitude militaire. L'imposante structure s'étend sur une portion de territoire qui a complètement perdu les caractéristiques indiquées par Brusco mais le plan du fort reprend, comme cela avait déjà été le cas pour le dessin des cultures, la forme du plateau. Actuellement, de la partie sud-orientale du fort, se développe une végétation identifiable dans la catégorie de la « pseudosteppa » tandis que de l'autre côté prévaut la brousse mixte avec présence de chênes verts. Le fort doit son projet définitif (rédigé entre 1857 et 1859) au capitaine du génie Ernesto Belli qui reprenait, dans ses lignes générales, un précédent projet napoléonien, caractérisé par les deux « chevaliers » d'ouest et d'est et par le fossé continu. D'autres éléments particuliers de cette fortification sont le toit de la caserne défensive, constitué d'une « couverture à l'épreuve des bombes » (de la couche surélevée de terre végétale et tuiles « à la toscane » pour la récolte de l'eau de pluie) et le « rivellino » central, élément constructif nouveau pour les fortifications du Golfe de la Spezia. La forteresse, jusqu'à des temps très récents de propriété de la Marine militaire et maintenant transférée à la Commune de Porto Venere, est actuellement en état d'abandon et de forte dégradation. Comme dans le cas de Villa Smith le risque est que l'aliénation de l'objet conduise à une restructuration à fins touristiques qui, en plus de conduire à un inévitable bouleversement des structures originaires, privera définitivement toute possibilité de jouissance publique du bien. (Fig. 10).



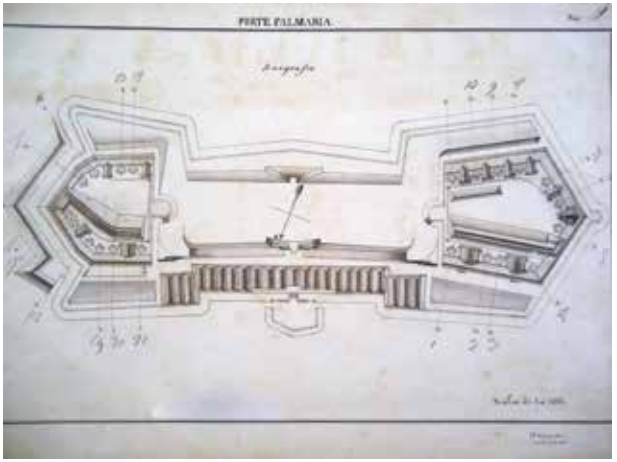
En conclusion : processus en cours

En effet, après le protocole signé en 2016 entre les administrations locales (Regione Liguria et Comune di Porto Venere) et la Marine militaire, un vaste patrimoine immobilier de la Palmaria appartenant à la Marine (environ 120 biens entre terrains immeubles pour une surface totale d'environ 400.000 m2) est devenu propriété de la Commune de Porto Venere. Il s'agit de terres agricoles et d'immeubles : bâtiments ruraux, forteresses et anciens logements militaires de service, anciennes batteries.

La motivation de ce passage était de favoriser le processus de requalification de l'île Palmaria à travers la vente aux particuliers ou, dans le cas des deux grands forts (restés inaliénables) leurs attributions à des concessionnaires.

La décision a rencontré l'hostilité des habitants de l'île et d'un grand nombre de citoyens de la Spezia qui, privés à partir de la deuxième moitié du XVIII e siècle de la presque totalité du pourtour côtier du Golfe par l'occupation militaires et par les établissements industriels, bénéficient de la Palmaria pour leurs loisirs : balnéation, trekking, jouissance des paysages. Sans compter les craintes soulevées par l'exemple offert par la mauvaise organisation du territoire côtier ligurien effectuée, comme on disait, dans les décennies passées, territoire presque partout sacrifié au tourisme spéculatif.

En effet, l'aliénation du domaine côtier public en cours en Italie c'est exactement le contraire des mesures prises en France en 1972 avec la création du *Conservatoire du Littoral* dédié à l'acquisition au patrimoine public inaliénable des nombreux sites côtier (Rossi et Balletti, 2005).



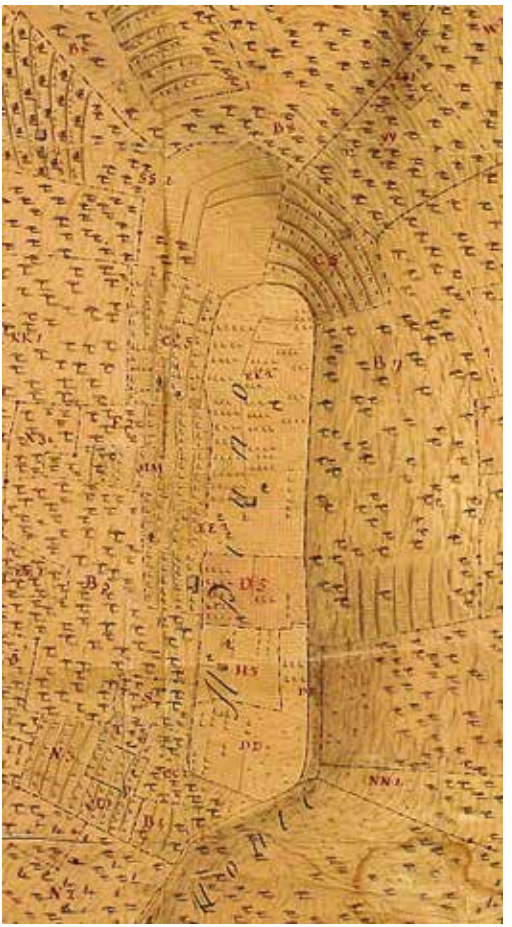


Fig. 9
Isola Palmaria, bâtiment en abandon. Photo 0. Strati, juin 2009.

Fig. 10
G. Brusco, L'Isola Palmara divisa nelle Tenute delli Particolari..., 1790, détail : Il Piano, site sommital de l'Ile Palmaria.
La Spezia, Bibliothèque "U. Mazzini", muro 6, 2DR11.

Fig. 11
Plan du « Forte Cavour », deuxième moitié du XIXe siècle, échelle orig. 1.1000. Roma, Istituto di Storia e Cultura dell'Arma del Genio (ISCAG).

Face au projet de réorganisation territoriale élaboré par l'administration de Porto Venere, défini « Masterplan », qui sous-couvert de la « requalification éco-durable de l'île Palmaria, qui protège les particularités historiques, paysagères et naturalistes de l'île » (Agence du Domaine, 2016) ouvre son exploitation à des intérêts privés, la population du Golfe, réunie en associations, s'est engagée dans un travail de recherche, d'étude, de communication afin de protéger cette précieuse pièce du puzzle méditerranéen (www.palmariaSI.org).(Fig. 11)

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HOLISTIC APPROACH TO THE MEDITERRANEAN ARCHITECTURAL HERITAGE AT RISK OF ABANDONMENT: THE CASE STUDY OF MONTALBANO ELICONA (ITALY)

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Argimusco Plateau. Photo G. De Domenico November 2018 (authorization granted).

A conceptual and methodological renewal is needed in the field of formation, transformation and management of the built environment. This need also concerns the architectural heritage, a non-renewable resource threatened by various types of risk factors, including abandonment. A similar phenomenon (intended as a lack of usage, which leaves room for improper or harmful utilization) is juxtaposed with overuse (intended as too intense and continuous a usage), which today is even more unacceptable, due to the need for social distancing as part of the containment measures of COVID-19. There is a wide and varied case history regarding abandonment, with reference to possible causes and consequences. Some intrinsic factors (stratification, heterogeneity) and contextual (geo-political structure and financial crisis; territorial imbalances; overlap with the ordinary built environment, etc.) increase the risk threatening the Mediterranean architectural heritage; this is connected to the multifaceted cultural identity of this area and is a consequence of long-term factors, in which natural and anthropic aspects are interlinked. New or aggravating challenges place even more emphasis on the theme of the sustainable use of the architectural heritage, rooted in the culture of conservation ever since its inception and in a state of constant evolution. The paper proposes the village of Montalbano Elicona, with its wealth of remarkable natural and cultural heritage in north-eastern Sicily, as a significant case study for experimenting the application of a holistic approach (oriented towards a high quality *Baukultur*) to various design opportunities.

Keywords: Mediterranean Built Heritage; Historical town; Sustainable Use; Holistic Approach; *Baukultur*.

Specific risks in the Mediterranean architectural heritage

The built environment, also in the case of architectural heritage (CoE 1985), has a multiple essence that is the result of tangible and intangible factors and of dynamics deeply rooted in the specificity of the place, which can be better assessed from a multi-scalar perspective. For this reason, some particular characteristics can be observed in the Mediterranean architectural heritage, linked to the multifaceted cultural identity of this area, and considered as a consequence of *longue durée* factors, in which natural and anthropic aspects are intertwined (Brauduel 1985): 1) since ancient times, the Mediterranean has been a melting pot of cultures, facilitating contamination between different populations; 2) the continuing human presence in the same places, and a building culture not inclined towards substitution, have

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determined a built heritage that often bears witness to stratifications from different eras, widespread throughout the region; 3) the wide and varied case history of the heritage presents a very heterogeneous picture in terms of level of knowledge, state of conservation and enhancement strategies.

Specific characteristics can also be identified in the risk to which the Mediterranean architectural heritage is exposed with regard to the global framework, in which the main threats to the *spirit of place* (ICOMOS 2008) derive from factors that have been out of control and increasing (climatic change, mass tourism, armed conflict and urban development) [www.icomos.org/en/get-involved/inform-us/heritage-alert/heritage-at-risk-reports]. In particular, intrinsic factors (stratification, heterogeneity) and, above all, contextual factors (such as: the intertwining with tangible and intangible aspects of the ordinary built environment; pressing contemporary needs conflicting with conservation; and imbalances between densely inhabited urban areas not far from internal areas, always or seasonally unpopulated) increase the complexity of the risk. Other specific contextual risk factors derive from the geo-political framework of the Mediterranean Sea, which has lost its ancient centrality, to become the border between southern Europe and the MENA (Middle East and North Africa) area, the scene of increasing and structural migratory flows. Furthermore, the continuing financial crises and a poorly *objective-based* mentality increase the criticality of the scenario, bearing in mind the fact that in the Mediterranean area the public authority usually plays a prominent role, both in the direct management of the architectural heritage and in the definition of relative guidelines.

Therefore, there is a pressing need for identify unitary strategies, based on a holistic vision, in order to effectively address risk factors and leverage opportunities, enhancing the potential of the architectural heritage, understood as both a tangible basis of cultural identity, and a cornerstone of regional development.

Risk of abandonment and sustainable use

The *Carta del rischio* [*Risk Charter*], a government decision support system launched in Italy in the last quarter of the 20th century, can provide some useful insights in focusing on the risk of abandonment. The system was based on the criterion of monitoring the potential conditions impeding the conservation of the built heritage, starting from the distinction between intrinsic conditions and territorial danger (static-structural, environmental and anthropic risk) [http://www.cartadelrischio.it]. The *Risk Charter* should have provided a tool, geared towards planned conservation, for complete and wide-ranging knowledge of the built heritage. Instead, this ambitious project was implemented

unevenly over the national territory and then abandoned, giving way to sectoral visions, such as the one focused on seismic vulnerability (Petraroia 2014).

Actually, the clear separation of risk factors on the basis of the distinction between intrinsic and contextual causes or between natural and anthropic factors, may today appear to be a forced or excessive simplification. Abandonment in particular, a risk arising from anthropogenic factors, may be connected to other contextual risk categories: for example, whole settlements being definitively abandoned as a result of natural events (earthquakes, landslides). Furthermore, abandonment can also derive from intrinsic conditions of the built heritage, such as access difficulties, conditions of incompleteness or vulnerable and unreliable building structures.

In general, adopting an appropriate long-term vision, the risk of abandonment is similar to the risks in certain types of unsustainable use. In fact, the absence of any kind of activity, and therefore of direct or indirect users in the architectural heritage, renders almost meaningless any testament to the past and amplifies the phenomenon of inattentiveness, which then jeopardizes conservation. On the other hand, *overuse* (too intense and continuous a use) can also be considered a risk factor because it increases wear damage, thus compromising satisfactory utilization. Apart from the quantitative aspects, the unsustainable use of architectural heritage, may present qualitative aspects, in the event of *abuse* (illegal use; improper occupation) or *misuse* (Sulfaro 2018).

The issue regarding the appropriate and sustainable use of the architectural heritage has distant theoretical origins, which have developed in parallel with the importance gradually attributed to interaction with the social sphere. Since the early 20th century, the important role of heritage conservation has been recognized in contemporary use, despite the possible conflict with conservation: one might mention the *use-value* defined by Alois Riegl (1903) and the well-known distinction made between *living* and *dead monuments* (Locke 1904). The *Venice Charter* underlined the correctness of contemporary use, placing decisive limitations on the operational level (ICOMOS 1964, art. 5). Subsequently, contemporary use became an explicit prerequisite for the conservation of the architectural heritage, imposing references to the socio-economic dimension. From a European perspective, in the context of *integrated conservation*, it was specified that «The conservation effort to be made must be measured not only against the cultural value of the buildings but also against their use-value» (CoE 1975).

Again within the European reference framework, where the social value of cultural heritage is particularly felt, the 2005 *Faro Convention* should be remembered (aimed *inter alia* at «emphasise that the conservation of cultural heritage and its sustainable use have human

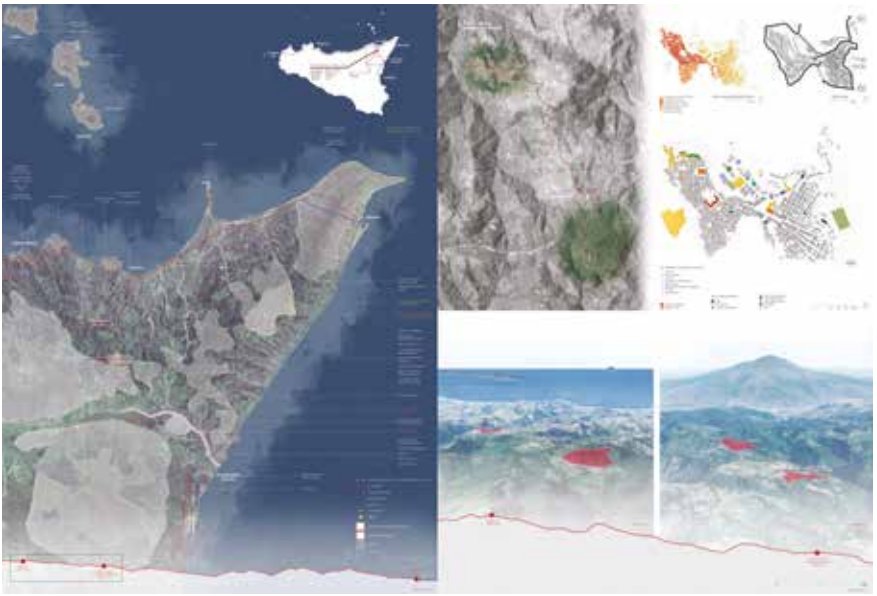


Fig.1
Territorial framework of Montalbano Elicona (Lo Giudice 2019).

development and quality of life as their goal») which devotes an entire article to the *Sustainable use of the cultural heritage* (CoE 2005, art. 9). On a global level, the contribution of use in defining the *Cultural Significance* of a place was highlighted in the 2013 *Burra Charter*, which underlines the need for *compatible use*, meaning «a use which respects the cultural significance of a place. Such a use involves no, or minimal, impact on cultural significance» specifying that «Retaining, modifying or reintroducing a significant use may be appropriate and preferred forms of conservation» (ICOMOS 2013, art. 1.11 and 23).

In light of the theoretical developments mentioned here, and of wide-ranging operational experience, awareness is now mature regarding the centrality of the issue of use, in counteracting abandonment or unreliable conservation. This is demonstrated by the fact that the separation between *living* and *dead monuments* has been definitively overcome by *people-centred approaches* to conservation, based on an all-encompassing vision of *Living Heritage* (Wijesuriya 2015:6).

The holistic approach and *Baukultur*

In order to tackle the risk of abandonment of the built heritage, especially when the social component assumes an even more important role, realistic and long-term revitalization

strategies are needed, which look at the entire built environment holistically (taking into account the specific features of the parts with cultural significance within a general framework) and which are based on the principle of including the users (both members of the host communities and visitors).

Two different considerations reinforce this need, bearing in mind the specific conditions of the Mediterranean architectural heritage: the complex intertwining of different types of built environment (in which the parts with cultural value do not have precise physical boundaries when compared to the rest of the built environment); the current trend towards a *people-centred* approach to heritage, which gives the visitor/user a central role in the processes, because of the focus on the objectives of *human development* and *quality of life* (CoE 2005).

The trend towards a holistic approach to architectural heritage must be considered within a broader vision of «integrated urban development as a prerequisite for successful urban sustainability», considered as appropriate to European poly-centralism (EU 2007). Therefore, the concept of *Baukultur* (*culture of construction*), which originated in Germany, was institutionalized, especially in Switzerland; it was shared in 2018 by the European Ministers of Culture in Davos, and may offer significant insights. Despite being a concept rooted in the Central European mentality, *Baukultur* offers a theoretical and operational framework that is globally useful for a holistic approach to the built environment. In fact, the term perfectly summarizes the interrelationships between cultural identity and any human activity that produces consequences on the built environment, in which infrastructure, public space, ordinary buildings and architectural heritage are considered as a single systemic entity, intertwined with the anthropic and natural environment [https://davosdeclaration2018.ch/].

The unitary vision of *Baukultur* goes beyond the distinctions between the building process that regards new constructions or existing ones, in the same way as the concept of *building quality*, as defined according to the *performance approach* developed in the last quarter of the 20th century, may already refer to existing performance (downstream of the building process, in the management phase) or to performance objectives/design requirements (upstream of the building process, in the planning and design phase) (UNI 2005).

However, when compared to this approach, to which the orientation towards building quality owes so much, the concept of *Baukultur* also helps to remind us that quality is not a mere technical aspect, limited to the sphere of experts, and that, on the contrary, it is a strategic objective to be traced back to the sphere of users, centred around organizational and cultural aspects (Pacey 1983).

Fig. 3
The town of Montalbano Elicona seen from the south. Photo Belfiore. May 2019 (authorization granted).

The *Davos Declaration* points out that, in order to achieve a *high-quality Baukultur*, shared responsibility is needed, for which the current generation will be called to respond to posterity. There is the need for the continuous and integrated commitment of public institutions and private stakeholders, technicians and economic operators, individuals and communities. The concept of *Baukultur* helps to identify a holistic approach that can be applied operationally, in the analytical, planning and management fields, focusing on the same objectives (safeguarding: tangible and intangible cultural identity; social cohesion; environmental sustainability; inclusive health; and well-being), without neglecting the specificities of the field of application.

Montalbano Elicona as a case study

The theme of the holistic approach to architectural heritage is part of a line of research, explored over the last twenty years at the Department of Architecture of the University of Palermo, based on three fundamental theoretical bedrocks of Architectural Technology: systemic vision, processual dimension and quality orientation. The agreement signed in 2019 with the Municipality of Montalbano Elicona (a town of about 2100 inhabitants that rises up 900 m a.s.l. in the north-eastern part of Sicily; Fig. 1) offered a stimulating opportunity to apply it in practice, adding an important step to the *third-mission* activity (in the Italian university system, understood as the transfer of scientific knowledge to the needs of the territory).

Montalbano Elicona can be considered a case study of general interest, because it has many specific characteristics of the Mediterranean architectural heritage mentioned above. The strategic location with regard to ancient trails, the abundance of water of

excellent quality, the extraordinary beauty of a landscape suspended between the Etna volcano to the south and the Aeolian islands to the north, are the main factors that have dictated the continuity of human permanence in this area since very remote times.

Despite the depopulation (-25% fall in resident population from 2001 to 2019), Montalbano Elicona today can be considered anything but an abandoned village,; the human factor and the vitality of the intangible heritage (religious traditions; historical commemorative events; traditional activities in the artisanal, agricultural and gastronomic fields, etc.) greatly nurture the *spirit of the place*, with regard to the connotations mentioned above. In recent years, the municipal administration has made huge efforts to enhance the natural and cultural heritage, involving the local community and counting on its remarkable renown (we might mention the Argimusco plateau, the imposing Swabian-Aragonese castle, the annual *Festa Aragonese*; Figs. 2-4). Among the numerous initiatives, we should recall the victory in the national competition *Borgo dei borghi* in 2015, which was followed by selection as the setting for the annual conference ICOMOS ICHAM *Discover Sicily's Argimusco a holistic approach to heritage management*, which projected Montalbano Elicona on to the international stage [http://icahm.icomos.org/2018-icahm-annual-meeting-sicily/].

However, looking at the buildings of the village as a whole, some concern remains regarding the risk of abandonment; this insidious factor is limited to some areas of the town and to the scattered settlements. Especially in the areas less affected by the flows of visitors, advanced ruination is underway in numerous smaller buildings that have not been used for years, mostly residential. Paradoxically, the effects of abandonment appear greater in those building interventions that were carried out during the second half of the 20th century and have distorted the original technological solidity, with the insertion of foreign construction materials, both in the structures and in the finishes. Similar pockets of abandonment and loss of identity in the building structure are symptoms of development that is still uncertain; it requires further efforts to consolidate it, by addressing broader and more lasting objectives than those achievable with single initiatives and by aiming at *sustainable use*, integrating the heritage with contemporaneity (Fig. 5).

On the one hand, the main risks in the lack of an overall picture are uncontrolled *touristification*, with distortion by *gentrification* (Ojeda and Kieffer 2020), and, on the other, the accentuation of economic and demographic imbalances already in place, with an increase in the pockets of abandonment, also including the actual replacement of buildings, without the indispensable, procedural and holistic vision.

Three studies have so far been carried out on Montalbano Elicona, being only apparently disconnected because they are applied to distinct design occasions (oriented to bio-climatic and

Fig. 4
Festa Aragonese in the village of Montalbano Elicona. Photo M.L.G. August 2015.

Fig. 5
Montalbano Elicona. View of one of the oldest parts of the town. Photo G. De Domenico September 2015 (authorization granted).

design for all criteria); they demonstrate the multi-scalar potential of the holistic approach described above in general. The design solutions identified could still be perfected and studied in depth, but the basic approach remains methodologically fixed on the identification of the expressed and implicit needs of three categories of stakeholders: the municipal administration as managing body; the local community and the visitors as users. The first experimentation focused on the need to improve the use of Argimusco, a plateau characterized by monumental rocks featuring zoomorphic and anthropomorphic

forms, whose candidacy as a UNESCO Geopark has been prefigured. Some archaeological evidence from the surrounding area and the archaeo-astronomical interpretation have led to the hypothesis of a sort of natural sanctuary intended for rituals linked to the mountain, Rocca Novara, as equinox indicator (Orlando 2017). Any anthropogenic modification intervention that may be envisaged in the Argimusco area, risks compromising an extraordinary and evocative landscape. Guided by this awareness, the proposal for enhancement included the identification of trails, with different degrees of accessibility, which connect most of the more significant points of the area, and the preferred location for a visitors' center, sized and oriented with reference to a geometric mesh originating from the ruins of a non-too-distant medieval *fondaco* [warehouse] (Fig. 6). The new building, of minimal size and partially-underground, is intended to offer certain essential services, applying passive solutions and using dry construction techniques and renewable energy sources (Fig. 7).

The second experiment focused attention on the urban fabric of the village, developed in successive phases around the Swabian-Aragonese castle, analysing the conditions of accessibility and identifying possible solutions for improving it. In the awareness that total accessibility remains unattainable in steep urban contexts (with an ancient layout), certain homogeneous sectors have been identified (for their altimetric characteristics, urban conformation, building consistency, and user flows). Minimal, widespread interventions (arrangement of simple handrails in strategic points) and two public elevators in the proximity of

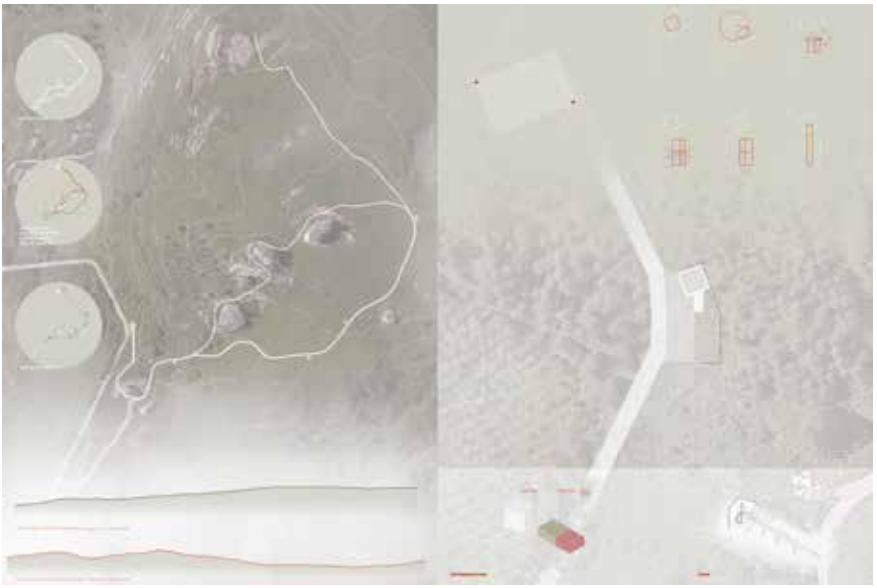
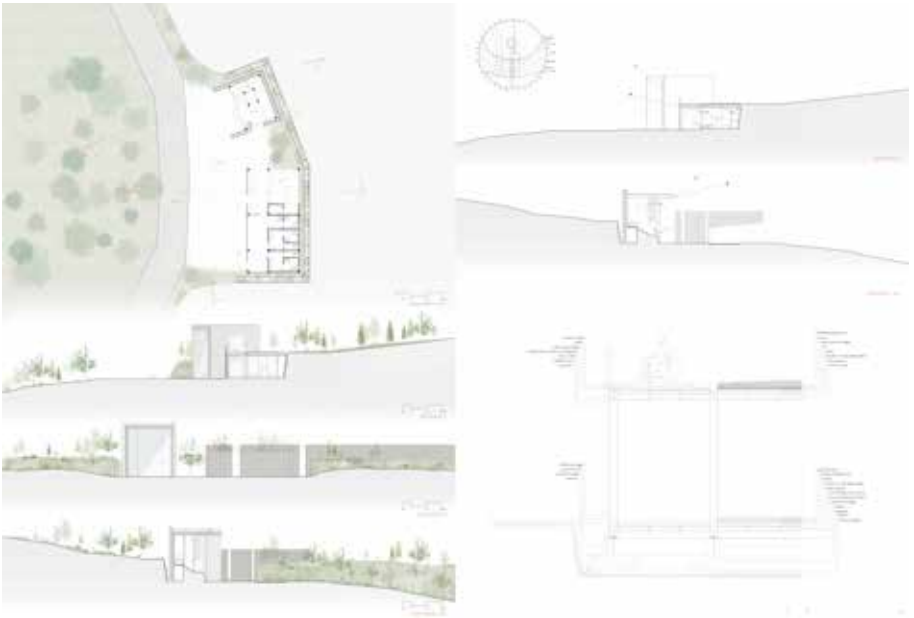


Fig. 6
Design for the Argimusco trails and studies for the location of the visitors' centre (Lo Giudice 2019).

Fig. 7
Visitors' center design for Argimusco (Lo Giudice 2019).

ruined buildings, (integrated with urban furniture solutions) (Figs. 8-9), aim to facilitate mobility around the village for people with walking difficulties ; all this would improve the lives of residents and, in view of the expected general aging of the population, would prove more attractive to visitors.

The third experiment concerns the completion of a building originally intended to house a bus station; only structural elements of reinforced concrete, based on the interesting architectural design from the early 1990s, had been put in place (Fig. 9). The location and the considerable size (which were originally related to urban planning forecasts never carried out) give the unfinished building the potential role of: 1) *call card* for those arriving at the village from the Tyrrhenian coast; 2) urban junction connecting a twentieth-century expansion area and the town hall square, located at different heights; 3) space to accommodate disparate activities, of which the local community feels the need, which could clash with the conservation of ancient buildings due to regulatory problems or distributive and functional conditions. This experimentation was linked to another line of design research devoted to unfinished constructions; it saw the involvement of dozens of students from the degree course in Architecture and is still the subject of in-depth study.



Conclusions

In recent months, the COVID-19 pandemic has cast a shadow of uncertainty that is hindering all medium and long-term forecasts by individuals, families, communities and institutions, imposing on the international community, a search for the *next normal*, and also heavily affecting the cultural sector [https://en.unesco.org/covid19]. The disparity of the consequences of the *lockdown* on the various economic and productive activities and the *digital divide* (which has further privileged those who can continue their activities, making use of the benefits of the *Fourth Industrial Revolution*) have rendered pre-existing socio-economic inequalities, discrimination and exclusion ever more evident.
At the same time, many have expressed the hope that such an extraordinary contingency could constitute a historic opportunity to concretize the paradigm shift invoked for almost forty years, with the concept of *sustainable development*, starting from a fuller awareness of the consequences of human actions [https://www.youtube.com/watch?time_continue=1043&v=YtxP7Ya98uk&feature=emb_title&ab_channel=VaticanNews-Italiano].
As for the specific field of cultural heritage, the impact of COVID-19 «remains rather unknown and largely undocumented» and, for this reason, some *Tools for Identifying Risks,*

Fig. 8
Studies to improve accessibility to the village of Montalbano Elicona. Wide-ranging interventions (Coppola 2020).

Fig. 9
Studies to improve accessibility to the village of Montalbano Elicona. Design for a public elevator (Coppola 2020)

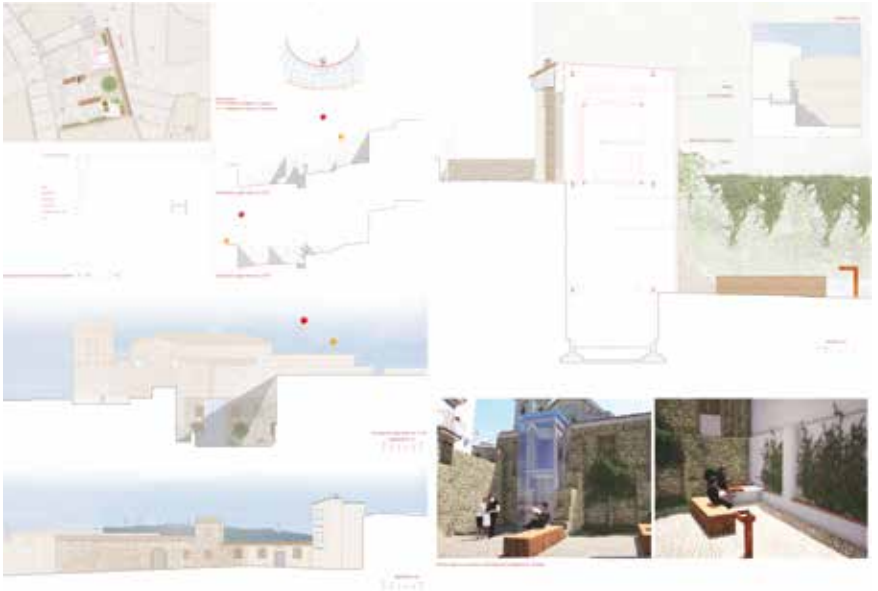


Fig. 10
The unfinished public building, seen from the top of the Swabian-Aragonese castle of Montalbano Elicona (Photo M.L.G. August 2020).

Monitoring Impacts, Assessing Needs have been developed [https://www.iccrom.org/heritage-times-covid]. Focusing our attention on the Mediterranean architectural heritage, the pandemic is threatening the specific characteristics of the area with various interacting effects: the limitation of funds directly devoted to cultural heritage; the diminishing tourist flows that contributed to support local economies in the previous normality; robust and reliable interventions are even more indispensable, aimed at minimizing all forms of risk; prevention or hindrance of integration between tangible and intangible assets.

Despite all this uncertainty, however, we might envisage a rapid evolution of the contemporary scenario, leading to a transformation of the relationships between human beings and the built environment (especially the public, both ordinary and with cultural significance), renewing and integrating the notion of sustainable use. The immediate and direct actions regarding the material aspects (aimed at implementing the necessary distancing to contain the contagion) are already being accompanied by a conceptual renewal of the architectural space, which will provide an opportunity for a methodological and procedural renewal. This renewal will necessarily be gradual and its effects may well be more incisive, owing to the contribution of a holistic approach and unitary strategies.

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AUTOUR DES VILLAGES HISTORIQUES ABANDONNÉS: VALORISATION, MISE EN RÉSEAU DES RESSOURCES ET STRATÉGIES COMMUNES DE GESTION DU PAYSAGE

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Triora (IM): le village est construit sur la crête d'un promontoire, en continuité avec le système de terrasses, qui caractérise les champs cultivés et aussi la forêt anthropique de châtaigniers fruitiers, @ A. Ghersi.

Many abandoned villages of the Italian Alps and Apennines were part of rural systems, based on the use of resources, from woods to cultivated land.
Liguria presents examples of these ghost towns, for which revitalization hypotheses were put forward, as in Giancarlo De Carlo's project for the "cable village" of Colletta di Castelbianco, proposing, many years ago, the use of new technologies to relieve physical insulation.
What has been lost is the perception of the value of the landscape: what reasons can attract new inhabitants to these internal valleys?
An effective strategy must be able to understand the reason and effect of the abandonment, to interpret the village subsistence systems, the existing resources, aiming to the recovery of the entire landscape contest. The landscape approach integrates the analysis of architectural artefacts with the analysis on a larger scale, to understand the landscape transformation, the abandonment phases, expansion of invasive species, hydrogeological instabilities.
The multidimensional and interdisciplinary study allows an interpretation/evaluation of the critical issues and existing values, to plan actions for a networking of resources, a global improvement of the landscape heritage. The involvement of possible local actors and the reconstruction of shared projects (restoration of buildings and resumption of agricultural activities, typical products, uses and traditions of the past, reestablishment of an emotional relationship with the places) are the only way to guarantee lasting effects, to foster socially enriching projects.

Mots clés: Effets de l'abandon du paysage, Programmes stratégiques de valorization, Agriculture créative, Gestion du paysage

Approche et stratégies paysagères

Les nombreux villages abandonnés des Alpes et des Apennins italiens sont souvent des villages ruraux, qui étaient basés sur l'utilisation des ressources, des bois aux terres cultivées, plus près des habitations. La Ligurie présente de nombreux exemples de ces villes fantômes, pour lesquelles de nombreuses hypothèses de revitalisation ont été avancées, comme dans le projet de Giancarlo De Carlo pour le "village câblé" de Colletta di Castelbianco, proposant, il y a de nombreuses années, l'utilisation de nouvelles technologies pour soulager l'isolement physique. Dans chaque cas particulier, il est important de comprendre quelle est la raison et l'effet de l'abandon et quelle relation peut être reconstruite entre les nouveaux

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Fig. 2
Un petit bâtiment rural abandonné dans le paysage en terrasses des Cinqueterre (SP): on peut voir une niche créée dans le mur amont, qui faisait partie du mobilier intérieur du bâtiment, @ A. Ghersi.

habitants et le contexte, pour encourager la récupération des villages et du système qui les entoure. Dans la plupart des cas, l'abandon du village est lié à l'abandon de l'exploitation du paysage. Les villages inhabités ne sont en fait qu'un élément d'un contexte paysager plus large, dans lequel la survie des communautés était basée sur un système intégré d'utilisation de l'eau, des terres arables, des pentes boisées et des pâturages au sommet, selon stratégies et modèles d'organisation de la vie qui ont aujourd'hui perdu leur sens, jusqu'à déterminer leur abandon. Ce qui a été perdu, c'est la perception de la valeur du paysage: quelles raisons peuvent attirer de nouveaux habitants dans des zones éloignées des zones côtières denses? Il faut repenser le rôle des vallées internes, redécouvrir plusieurs avantages possibles d'une relation avec un paysage de montagne, raide, difficile, mais riche en ressources différentes, liées à la nature, au manque de pollution, à l'articulation des terrasses en continuité évidente avec les habitations, en plus de la valeur historique-architecturale et sociale des villages.

Une stratégie efficace doit être capable d'interpréter les ressources existantes, plaçant la récupération de l'ensemble du système paysager comme objectif de requalification. L'approche paysagère intègre l'analyse des artefacts architecturaux à l'analyse à plus grande échelle, pour comprendre les transformations du paysage, à partir de la lecture du système qui garantissait la subsistance du village (grâce à la connaissance de la vocation du terrain, selon le type du sol, de l'exposition de la pente, des caractéristiques microclimatiques), puis analyser les phases d'abandon et de dégradation, d'expansion d'espèces envahissantes, d'instabilités hydrogéologiques, dues en grande partie au manque d'action d'entretien par les communautés. L'étude, multidimensionnelle et interdisciplinaire, permet une interprétation et une évaluation des enjeux et des valeurs critiques présents, à l'égard desquelles des interventions peuvent être planifiées pour une mise en réseau des ressources, une amélioration globale et une redécouverte de nos racines identitaires (Steiner, 1991). Le thème le plus significatif concerne la gestion active[1] du patrimoine paysager, qui devient l'élément clé sur lequel travailler. L'implication d'éventuels acteurs locaux et la reconstruction de projets partagés (restauration des bâtiments et reprise des activités agricoles, produits typiques, usages et traditions du passé, rétablissement d'une relation émotionnelle avec les lieux) sont le seul moyen de garantir des effets durables, capables de faire grandir des projets complets, accueillants et d'enrichissement social.

Les motivations de l'abandon

Pour comprendre les raisons de l'abandon des villages intérieurs, il est important l'étude des transformations du paysage, à commencer par l'exploitation des ressources (forêts et pâturages) et la construction de systèmes de culture (qui en Ligurie coïncident avec des systèmes complexes de terrasses en pierre sèche[2], sur lesquels les maisons sont également construites, dans une relation inséparable), en lien avec la construction des zones habitées. A l'abandon suit une progressive dégradation, avec l'expansion des mauvaises herbes et des bois de basse qualité, la perte d'efficacité des systèmes de drainage et l'apparition de l'instabilité sur les coteaux (en particulier là où la nécessaire maintenance des systèmes en terrasses fait défaut).

Certains villages ont été abandonnés en raison d'événements naturels désastreux (tremblements de terre, glissements de terrain), en raison de l'épuisement des ressources locales (par exemple les mines) ou en raison du manque d'accessibilité aux allées, mais en général, de

[1] Le thème de la gestion du paysage s'inscrit dans les objectifs de la Convention Européenne du Paysage (Florence, 2000) et fait partie intégrante du projet.

[2] L'art de la construction de murs en pierres sèches est inscrite au patrimoine culturel immatériel de l'humanité de l'Unesco depuis 2018.

Fig. 3
Le vieux village de Balestrino (SV), construit sur un éperon rocheux dans une position stratégique avec vue sur la mer, dominé par le château Del Carretto, est aujourd'hui abandonné et interdit au public. Le village a été le décor cinématographique idéal du film Inkheart, en 2008, et de la série fantastique Games of Kings, en 2018, @ A. Ghersi.

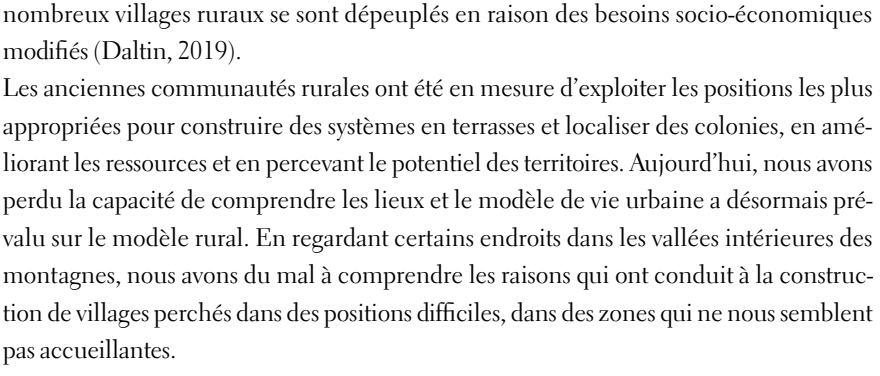

Fig. 4
Les terrasses encore cultivées, au pied du vieux village de Balestrino, avec les oliviers qui, avec vignobles, légumes et céreales, constituaient l'essentiel de l'économie locale, @ A. Ghersi.

nombreux villages ruraux se sont dépeuplés en raison des besoins socio-économiques modifiés (Daltin, 2019).

Les anciennes communautés rurales ont été en mesure d'exploiter les positions les plus appropriées pour construire des systèmes en terrasses et localiser des colonies, en améliorant les ressources et en percevant le potentiel des territoires. Aujourd'hui, nous avons perdu la capacité de comprendre les lieux et le modèle de vie urbaine a désormais prévalu sur le modèle rural. En regardant certains endroits dans les vallées intérieures des montagnes, nous avons du mal à comprendre les raisons qui ont conduit à la construction de villages perchés dans des positions difficiles, dans des zones qui ne nous semblent pas accueillantes.

La principale cause d'abandon et de dégradation est justement «l'ignorance collective» (Ferrara, 2017), due à la perte de la conscience spontanée et de la culture des lieux, qui nous a rendus insensibles aux valeurs des communautés rurales du passé.

La vie dans ces lieux était décidément différente de ce que nous pensons indispensable, basée sur des conditions de vie très simples (civilisation du châtaignier[3]) et des ressources

[3] Citi D., Solari F. (2007). Elementi costitutivi fondamentali del paesaggio dell'entroterra del Levante ligure: alberi monumentali e insediamenti produttivi in pietra. Dans: Ghersi A. (dir.), *Politiche europee per il paesaggio:*

extrêmement limitées, selon une économie de subsistance frugale, désormais inappropriée aux besoins de la société contemporaine de consommation. Le paysage rurale italien, bigarré et pourtant unifié, s'est largement désintégré, avant même la construction sauvage, en raison de la dissolution de la douloureuse, mais mesurée et patiente, trame séculaire de «l'Italie des paysans».

L'analyse des transformations du paysage, à travers l'interprétation de cartographies et de documents historiques et la comparaison avec l'état actuel, permet de comprendre comment le paysage a changé et quelles sont les tendances de développement les plus significatives en cours.

Ce que nous observons aujourd'hui représente l'effet des actions entreprises et des changements qui en résultent, mais c'est déjà une «photocopie de ce qui était dans le passé» (Ferrara 2017) ou le miroir[4] dans lequel nous ne pouvons plus nous reconnaître, et que ce n'est plus le "théâtre de beaucoup de nos sentiments" (Emiliani, 2016). Il contient le code génétique

proposte operative. Roma: Gangemi, pp. 310-329.

[4] Ghersi A. (2006). *Il paesaggio come specchio*. Dans: G. Gaggero, A. Ghersi (dir.). «Paesaggi di Liguria». Genova: De Ferrari, pag. VIII.

du passé mais porte les signes indicatifs du développement futur, qui nécessitent cependant des compétences de lecture spécifiques.

Dans les paysages des villages il faut récuperer la mémoire historique, le sens des lieux (Teti, 2004) et la signification de certains éléments et matériaux (Citi, 2013), qui témoignent le lien entre habitants et paysage. Quelquefois on retrouve les documents physiques de la structure complexe d'une communauté rurale, avec différents niveaux sociales, comme dans l'exemple de Velva (Castiglione chiavarese), dans la Vallée Petronio, aux épaules de Sestri Levante, où les maisons des familles importantes sont à coté des abitations des paysans, avec caves et des boutiques spécialisées, qui racontent le passé. Aujourd'hui Velva se transforme, grâce au Musée de la Culture Agricole (Figone, 2017), autour duquel historiens et passionnés locaux tentent de retracer les traditions (comme la fête du blé) et de ramener des activités au village[5], pour pouvoir reconstruire au moins une histoire de la façon dont les gens vivaient dans la vallée et le rôle de passage le long d'un chemin de connexion entre la Ligurie et l'Émilie.

Reconstruire une relation entre la communauté humaine et le paysage

Les villages historiques abandonnés ne sont qu'un élément d'un contexte plus large de paysage abandonné, où les stratégies d'organisation de la vie des communautés locales ont perdu leur sens. Par conséquent, si nous considérons les villages abandonnés comme un élément d'un système rural plus large (extraordinaire dépôt de culture matérielle, de connaissances et de techniques, de valeurs naturelles et socioculturelles[6]), les actions de conservation et de restauration doivent être intégrées à des actions stratégiques pour valoriser le contexte paysager.

Surtout, il est nécessaire de reconstruire et de réactiver une relation directe entre les habitants et les ressources existantes, en redéfinissant la relation entre la communauté humaine et le paysage.

Dans le cas de villages complètement abandonnés, il faut créer les conditions pour attirer des acteurs capables de réhabiter ces lieux extraordinaires, riches de souvenirs et de valeurs de témoignage.

Moins complexe est la mise en valeur des villages semi-abandonnés, où certains habitants peuvent encore assurer la protection du territoire et constituer le premier noyau d'une communauté à reconstruire.

[5] La ferme Pino Gino, qui produit du vin dans la vallée, a placé sa cave à barriques au fond d'un bâtiment restauré, contribuant à la revatilisation du village de Velva, à travers la proposition de visites et dégustations de vins.
[6] Comme les études de géographie ont bien mis en evidence, à partir de l'oeuvre de Emilio Sereni (1961), pour le paysage rural italien.

Les activités nécessaires à la conservation du patrimoine paysager doivent être de nature à garantir le partage d'actions continues d'entretien, de culture et de soins.
L'élément clé est la construction de la perception de la valeur, la capacité de voir ce paysage particulier et cette diverse dimension sociale, comme une ressource (Farina, 2019), par rapport à laquelle mettre en place une éventuelle nouvelle économie de vie.
Les systèmes de terrasses, par example, sont restées pratiquement invisibles pendant des décennies, ils n'étaient plus reconnues, et donc laissées à l'abandon. Seulement récemment[7], ils sont retournés à être interprétés comme des éléments de notre patrimoine culturel (Murtas, 2015).
En plus de la restauration et de la mise en valeur du patrimoine historique et architectural des villages, il est nécessaire de reconstruire une relation productive avec le système rural environnant, également à travers des systèmes mixtes qui intègrent l'agriculture traditionnelle avec des fonctions différenciées, du tourisme rural aux produits de niche. Biodiversité, mémoire, histoire, patrimoine culturel ne sont que quelques-unes des ressources, tant matérielles qu'immatérielles, que l'on peut encore trouver dans ces paysages dépeuplés.
La revitalisation durable de ces territoires dépend du modèle économique exploité: la dimension économique doit se baser sur la gestion du paysage et non seulement sur la récupération des villages comme résidences éloignées des zones périurbaines les plus denses. Le repeuplement, soit par des immigrés, soit par de riches touristes, qui n'ont pas une relation avec les traditions locaux, doit réussir à créer une nouvelle relation profonde entre nouveaux habitants et environnement rural, pour sauvegarder la durée de la gestion et de l'entretien du paysage. Dans les vallées montagneuses intérieures, derrière la côte ligure, qui révèlent leur fragilité face aux événements climatiques extrêmes, déterminant des situations de risque hydrogéologique, si l'action quotidienne de réaménagement des bandes fait défaut, le rôle de contrôle territorial que peut assumer la reprise de la culture est particulièrement importante (Bonardi, Varotto, 2016).
Certaines expériences liguriennes, de récupération de villages abandonnés et de construction de nouvelles communautés accueillantes (Bonesio, 2003; Paolella, 2019), constituent des cas d'étude intéressantes, notamment en ce qui concerne l'évolution dans le temps de la relation avec les terrasses environnantes.
Le village médiéval abandonné de Torri Superiore (IM) a été repeuplé, à partir des années 90, par une petite communauté de nouveaux résidents, qui l'ont transformé en un

[7] Grâce aussi au travail de mise en valeur promu par l'ITLA (Italian Terraced Landscapes Alliance) et par d'importantes conférences mondiales, parmi lesquelles nous rappelons en particulier la troisième, qui a eu lieu en Italie en 2016 (Alberti et al., 2018).

Fig. 5
Les oliviers sur les terrasses au pied du village de Balestrino (SV), @ A. Ghersi.

écovillage pour une hospitalité généralisée, dans le strict respect de la durabilité environnementale et de l'application des principes de la culture en permaculture (Berizzi, Rocchelli, 2019), à travers laquelle même les zones cultivées font partie intégrante du projet.

A Colletta di Castelbianco (SV), abandonné depuis les années 1920, le projet de De Carlo identifie et réinterprète un «code génétique» à respecter pour la restauration, entre 1993 et 1999, d'une soixantaine de logements au sein du village qui, avec le haut débit, il devient un modèle de référence en tant que «cybervillage». Une communauté multiculturelle internationale est l'architecte de la revitalisation (Wiig, 2019), également à travers des ateliers d'architecture et art[8]. La relation avec les cultures se reconstruit à partir d'une vaste oliveraie, gérée de manière communautaire, qui a conduit à la mise en place de la fête des olives, qui sont récoltées depuis 2005. Ces dernières années, la culture du blé a également été réintroduite sur bandes.

Agriculture créative et gestion partagée

Aujourd'hui, le rapport entre la campagne et la ville est en train de changer: la ressource de la campagne est redécouverte tant d'un point de vue historico-culturel que du point de vue de la santé et du bien-être.

[8] Une communauté internationale d'artistes a été le moteur de la mise en valeur du village de Bussana vecchia (IM), qui, abandonné en raison du tremblement de terre de 1887, a été «occupé» par des artistes dans les années 1960, selon un modèle d'utilisation temporaire des bâtiments. Aujourd'hui la situation a beaucoup changé d'un point de vue politique et philosophique, et le différend avec la Municipalité relatif à la propriété des propriétés est en cours de résolution, pour favoriser la valorisation touristique du village (Ivaldi, Marro, 1994).

La redécouverte et la revitalisation de la richesse des paysages ruraux, à travers à travers un parcour de participation (Magnaghi, 2000; Chambers, 2002) et interprétation de la vocation des lieux, permet la récupération des villages abandonnés et des artefacts (moulins, séchoirs …), et reconstruit le système économico-productif, en commençant par les productions locales, mais en arrivant à la redécouverte des traditions passées.

Le modèle de l'agriculture multifonctionnelle peut représenter une alternative intéressante au modèle de vie urbaine. Le concept d'«agriculture créative»[9] remonte à ceci: une stratégie visant à impliquer les communautés locales dans des projets de mise en réseau des compétences de chacun, en respectant des valeurs partagées, pour s'associer et construire des modèles d'accueil et une nouvelle interprétation des différentes agricultures possibles, comme une œuvre à potentiel intéressant, pour attirer nouveaux jeunes habitants.

L'exemple de la viticulture[10], un secteur en pleine croissance en Ligurie, après un très long abandon, représente l'activité motrice et l'opportunité pour de nombreuses entreprises de valoriser les véritables trésors œnologiques encore présents, à travers la promotion de produits de qualité et lié à des formes d'œnotourisme qui permettent des propositions différentes[11].

Le défi complexe regarde l'entretien de la nature des lieux, en essayant d'éviter la marchandisation (Settis, 2002) et la muséalisation, par l'expérimentation d'un modèle socio-économique basé sur la cohérence avec les ressources existantes à valoriser.

Il est nécessaire de reconstruire une communauté aux intentions partagées (Berry, 2002), qui puisse mener un projet de gestion active du patrimoine, offrant l'hospitalité, des produits locaux et un nouveau mode d'accueil généralisé, de mise en réseau et de valorisation des particularités locales.

Outre la culture et l'entretien des paysages ruraux, les itinéraires culturels, gastronomiques et œnologiques, les randonnées découverte, les activités éducatives et ludiques, le tourisme expérientiel, l'hôtellerie généralisée, sont quelques-unes des différentes déclinaisons possibles d'une offre diversifiée pour des utilisateurs avertis.

La revitalisation de ces territoires est fortement liée aux énergies de transformation nécessaires à la re-signification de ces contextes, avec la participation et le soutien des parties prenantes (*stakeholders)* privés et publiques, (par exemple les municipalités, les villes

[9] La référence au concept-clé de «agriculture créative» découle de l'expérience des ateliers de participation publique organisés à Carro (SP) en 2008, pour la construction partagée du schéma directeur pour l'aménagement urbain locale (Ghersi, Villa, 2010; Pizziolo, Giacomozzi, Rubino, 2017).

[10] La présence de barriques et pressoirs dans de nombreux villages liguriens abandonnés (voir par exemple Felettino (SP) à Canate (GE), accessible uniquement à pied), témoigne de la présence de vignobles: le vin était un aliment important pour les populations interne.

[11] Dans plusieurs exemples, la récupération du terrassement du vignoble devient également un moyen de protéger les zones habitées en contrebas des glissements de terrain et des glissements de terrain. Découvrez le vaste vignoble au-dessus du village d'Airole (IM), également réaménagé grâce à un financement régional et européen.

Fig. 6-7
Détails du vieux village de Balestrino (SV), @ A. Ghersi.

métropolitaines de référence[12], les gouvernements régionaux et nationaux, ou d'autres entités internationales comme l'Union européenne[13]). Pour pouvoir engager un véritable processus de valorisation durable, le projet de ces lieux doit partir de l'analyse intégrée et multidisciplinaire, pour prendre en charge la programmation des différentes actions, de la restauration des bâtiments à la restauration des cultures, à la planification des actions de promotion et d'implication des acteurs locaux, qui devront assurer la gestion et l'utilisation du patrimoine récupéré, en devenant ses gardiens.

[12] Dans la zone de la ville métropolitaine de Gênes, il y a des villages abandonnés et des paysages ruraux, comme dans l'exemple, au milieu du Val Bisagno, dans la ville de Canate, accessible uniquement par un sentier pédestre (Stringa, 2008).

[13] Pour certains paysages ruraux historiques de qualité (Agnoletti, 2013), l'inscription sur la Liste du patrimoine mondial de l'Unesco ou la reconnaissance par la FAO en tant que GIAHS, systèmes historiques agricoles d'importance mondiale, constitue un moteur important pour le développement touristique et culturel Ces récompenses font toutefois suite à d'importantes actions devalorisation à mener de manière intégrée, revitalisant des paysages significatifs dans leur ensemble. Dans le cas des paysages de villages abandonnés, il pourrait être possible d'entrer dans le réseau de mise en valeur de zones plus fortes et voisines, déjà considérablement réaménagées.

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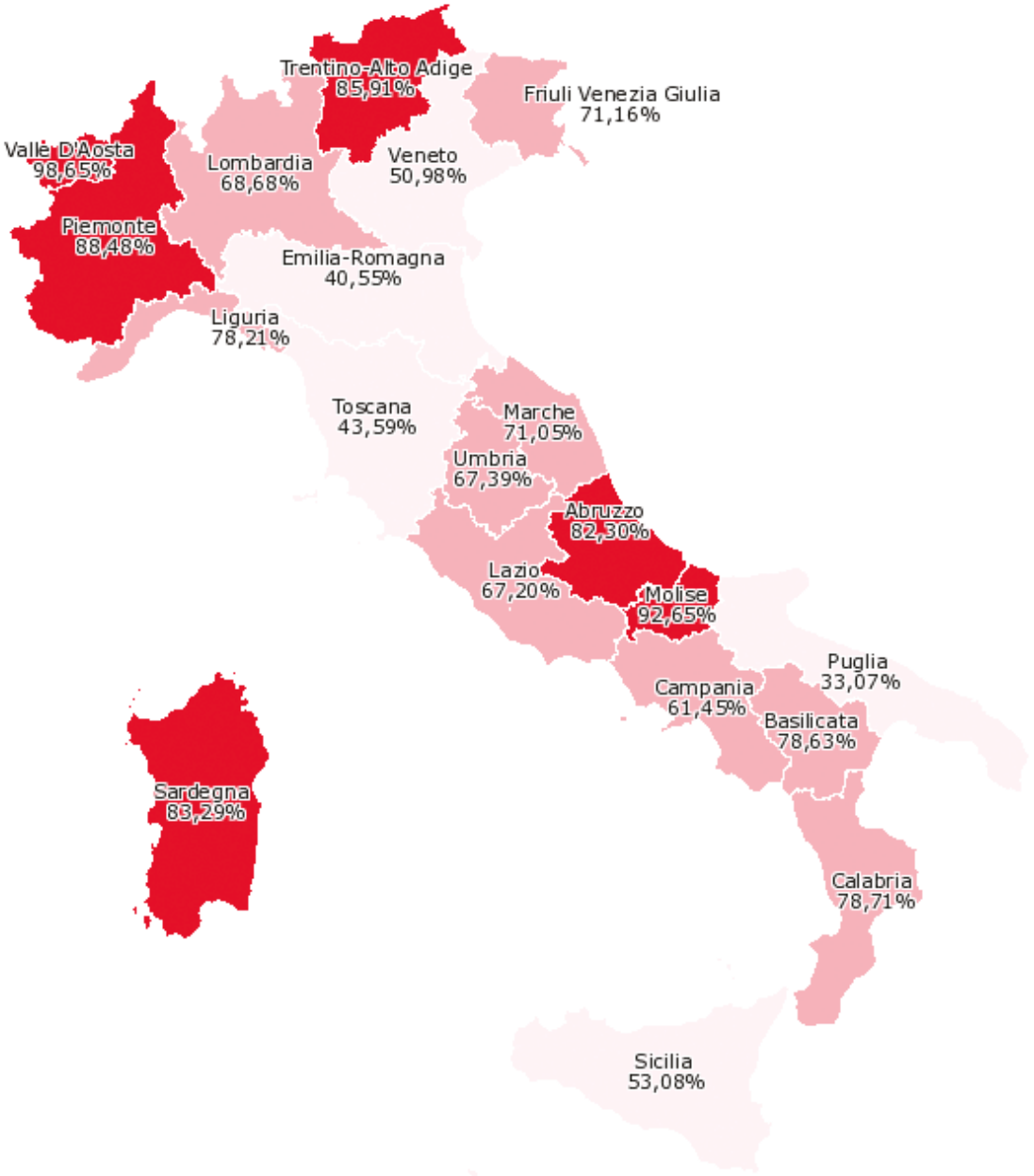
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Sicilia
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BACK TO THE SMALL VILLAGES. CRITICAL ISSUES AND PROSPECTS FOR A POST-COVID RE-APPROPRIATION OF BUILT HERITAGE IN THE MARGINAL INTERNAL AREAS IN LOMBARDY

Mariacristina Giambruno, Sonia Pistidda
Politecnico di Milano-Italia

Percentage of small Municipalities in relation to the total ones, divided by Region. Anticel processing based on ISTAT data (1st January 2019). Source: http://www.comuniverso.it/index.cfm?Mappa_Piccoli_Comuni&maplist=picomxreg&menu=590&legend=250,70 (last access 15th September 2020).

In the COVID-19 emergency, small villages have become the focus of debate regarding a renovated living model, distant from metropolitan areas' density across Europe. These reflections brought to light the discussion around a possible return to the small villages and marginal areas, pointing out the beneficial aspects: the possibility of living in places with a great sense of community, usable open green spaces, and lower density. But is a return really possible if the structural conditions of these places do not change? The prolonged and still unresolved pandemic has perhaps changed its perception and attracted interest. Even the conditions that led to its depopulation have not changed: the digital divide, distance from primary services (education, health, mobility), and economic stillness are critical points still waiting for a coordinated and systematic answer in terms of policies. The paper wants to analyze the critical issues, and the opportunities arising from a possible return to marginal villages within the general framework outlined above and reflect on practical tools to evaluate these places' potentialities, using as a case study the Lombardy region context, specifically the Lecco province.[1]

Key words: Historic abandoned villages; marginal areas; built heritage conservation; repopulation strategies; "reactivation" potential

Back to the small villages? A new emergency, old problems

The depopulation of places marginalized by the twentieth century's development processes is certainly not a recent phenomenon; more recent is the awareness of its extent and adverse effects on the territory, made more fragile by abandonment. The decrease in the resident population, sometimes wholly absent, has interrupted the daily care process that protected the environment from collapse and the built heritage from destruction.

Against, during the present health emergency, the urban model highlighted its critical issues concerning the housing density, the lack of green spaces, the overcrowding of public transport, and the difficulty in using private vehicles for sustainable transportation.

Those who had to face the long lockdown period in big cities experienced a challenging moment from a psychological point of view: homes of small size, minimal outdoor spaces,

[1] Although the paper is the result of a joint work of all authors. Mariacristina Giambruno is responsible in particular of the first paragraph and Sonia Pistidda of the second paragraph.
The conclusions have been drafted jointly.

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

without a neighborhood network in case of need, difficulties in supplying primary goods, and in contacting the health facilities. Furthermore, smart working and distance learning forced us to test new forms of everyday life, not always easy to manage. These are some of the reasons why the pandemic has rekindled the attention and the debate on small villages and the opportunity to return to more sustainable life models, assuming a possible exodus from the big cities.

So the critical issues suffered by the marginal territories in our country, but also the potential they could offer in terms of quality of life have gone beyond the narrow circle of experts and 'technicians' to reach the general public, thanks to the large space dedicated by the press to the invitation to repopulate these contexts made by famous architects.

It is a fact that during this period, many have returned to native places (which led to coining the term "south working") or to second homes, relocating many activities usually carried out in large cities. However, these initiatives' practical effects on the conservation and revitalization of the villages and the landscape remain unclear.

It is still too early to assess whether this pandemic will lead to a lasting return to marginal villages, especially in the absence of structural measures to recover the gap that led them to depopulation[2], even if some signs seem to be there[3]. This new attention has, in any case, highlighted the real problems that still prevent an immediate and significant return to the historic villages.

The gaps are the same that have led to the progressive abandonment and, at the same time, they are the causes that make difficult a return: physical connections, essential services, infrastructure (water, gas, and electricity), schools, healthcare, transport, welfare and the digital divide that still penalizes large areas of the country. In fact, there are still too many "white areas" in Italy, i.e., municipalities only partially covered by the connection infrastructures, focused mainly on the Alps and along the Apennine.

These areas have suffered a lot from this gap in the past months: smart working, distance-learning, or even merely the desire to overcome social distancing have been a

[2] Some signs in this sense are contained, for example, in the Decree of 10 August 2020, *Definizione dei parametri per la determinazione delle tipologie dei piccoli comuni che possono beneficiare dei finanziamenti previsti dalla legge 6 ottobre 2017, n. 158 [Definition of the parameters for determining the types of small municipalities that can benefit from the funding provided by law n. 158]* (GU General Serie n. 213, 27 August 2020). In the Decree, which comes three years after the law's approval, the criteria that "small municipalities" must have to access the contributions are precisely determined. A further signal in this sense appears in the *Linee guida per la definizione del Piano nazionale di ripresa e resilienza [Guidelines for the definition of the national recovery and resilience Plan]*: "attuazione della Strategia Nazionale delle Aree Interne e rigenerazione e riqualificazione dei contesti urbani e borghi rurali" [implementation of the National Strategy for Inner Areas and regeneration of the urban contexts and rural villages].

[3] «In the villages that are part of the Borghi più belli d'Italia network, Bandiere Arancioni and Borghi Autentici, houses are worth 15% more than ten years ago. The recovery projects of buildings today in ruins are increasing by 22% in the monitored Valley […]», Marco Bussone (president UNCEM), [UNCEM, 2020].

severe test. Yet, in Italy, 8,2 million people could continue to work from home (Gabanelli, Querzé, 2020): an interesting fact that could bring people back to repopulate these places stably.

A series of policies, strategies, and initiatives of different breadth and cogency seek an answer to abandonment, following the Covid emergency that has brought these places into the spotlight. The ongoing pandemic has indeed put in crisis one of the most stressed repopulation strategies in the past: tourism. In fact, it has represented one of the strengths of the repopulation of small villages, as underlined e.g. by the Law 6 October, n. 158 (2017), known as "Legge salvaborghi", that includes among the objectives the "contrasting depopulation phenomena and encouraging tourism" (art. 1).

The issue was also highlighted by the annual report of SNAI in 2018 (Lezzi), underlining the role of tourism and cultural heritage among the most crucial development factors.

Indeed, the tourism economy is an essential resource for revitalizing these areas, especially for its effects on the micro-economies of the different key sectors. However, tourism concentrated only in specific periods of the year does not favor these places' significant repopulation. Second homes remain closed for most of the year, schools and essential services do not reach the minimum numbers to be activated, and problems come back to the starting point. Furthermore, the tourism development, particularly from the seventies to the nineties, has undoubtedly brought some economic improvements for the population directly involved in the activities. Still, it has not had a widespread impact on making these territories less fragile. The development of the so-called "second homes" has further consumed the land, from one side leaving the widespread built heritage abandoned and, on the other, transforming it so profoundly to adapt it to the new temporary inhabitants with the results of losing its historical character.

If the pandemic emergency has once again focused the attention on these places, highlighting their resilient capacity compared to a new fragility demonstrated by cities, it has also underlined still existing ancient criticalities. One of the most relevant problems that the recent period has brought to light is the digital divide that characterizes most of these places[4].

A document by Uncem, Fondazione Montagne Italia, and Caire of July (2020) highlighted the issues. Being part of the "network" for these places represents a crucial node.

Bridging the digital divide that separates urban areas from inland and mountain areas could be a decisive step to make these areas more attractive and competitive. They are not only places of a tourist attraction but places to live.

[4] The digital divide regards three aspects: mobile phone, tv signal and internet connection.

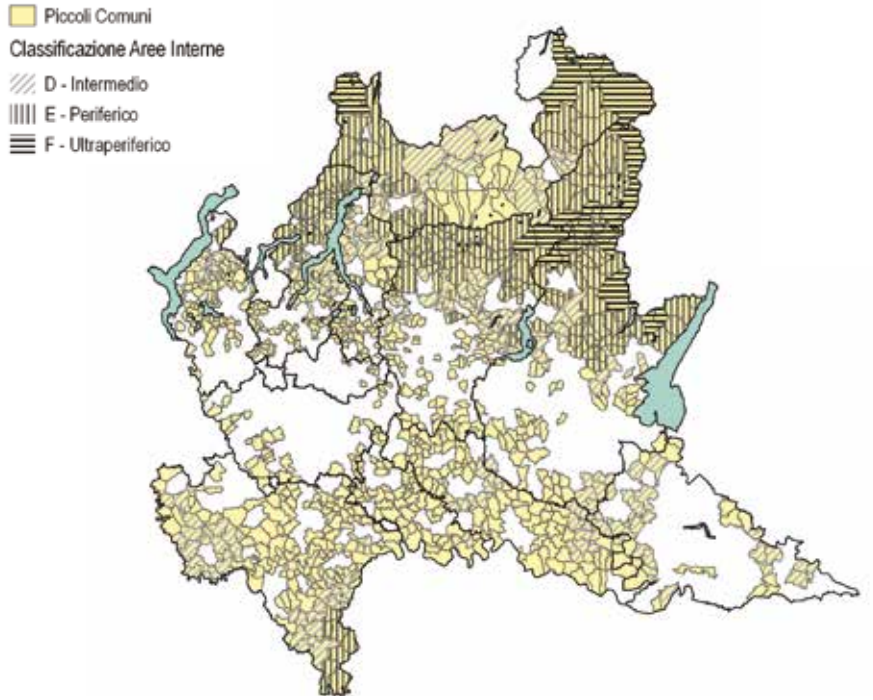


Fig. 2
A map of the Lombardy region shows the distribution of small municipalities. The data have been intersected with the SNAI classification for inland areas. Elaboration by the authors on Istat data (http://www.e-migrate.polimi.it/).

A step towards "digital inclusion" has been made in line with the Banda Ultralarga Plan (Ministero dello Sviluppo Economico), still very limited in Italy. On 24 July 2020, during the Stati Generali della Montagna (Uncem), the Minister for technological innovation and digitalization Paola Pisano signed a memorandum of understanding with Uncem "to implement coordinated actions program for the innovation and digitalization of Italian mountain municipalities". Connectivity means shortening the physical distances between the "polarities" and the marginal areas, certainly not in a physical sense but an "instant" and perhaps more effective way.

It means allowing the possibility to work in places different from the cities and have quality services for health and training. These are fundamental conditions for triggering a stable return in these areas, overcoming the pandemic's contingency, and making permanent what currently is only an escape from cities in an emergency condition. To make this possible, it will be necessary to have "mixed" functions in the marginal villages, combining the permanent residence with the seasonal one and intertwining the recovery of traditional agricultural activities with sustainable tourism.

If the trend of the return to marginal villages were to be confirmed in the long term, the widespread built heritage would play a significant role because it represents the driving force of the quality of these places. What should be the recovery process to allow coexistence between the housing needs and the maintenance of its historical substance?

The return of old inhabitants or the arrival of new ones is, at the same time, an opportunity and a threat to the "minor" architectural heritage, as well as the main incentives like the "façade bonus", the "energy-saving bonus," or the "super bonus", recently introduced also about the pandemic.

In the next paragraph, these general reflections become the opportunity to systematize some actions through a specific case study, the Province of Lecco.

"Reactivation" starts from the built heritage. The case study of the Lombardy region

The Lombardy region, the most densely populated in Italy, contrary to what one might imagine, is sprinkled with a large number of small municipalities[5]. This issue does not necessarily mean that the abandonment has an extensive character in the region, but it's undoubtedly a peculiarity that unites it to many other Italian areas (Fig. 1 and Fig. 2).

Recent research developed by the authors[6] focused on the Lombardy region has demonstrated the depopulation phenomena from 1951 to today.

The data processing showed the distribution of the phenomenon (see picture below): the shades of yellow and orange highlight the municipalities that have demonstrated an increase in the resident population. In contrast, the shades of gray underline those that have undergone a decrease. The territorial polarization appears very strong: the population increase in the central area, in the Varese province, and some alpine areas. On the contrary, the inhabitants decrease in large part of the mountains (Oltrepò Pavese and alpine valley), but also in lowland areas such as Lomellina, Sorinese, Cremonese, Casalasco, and Oltrepò mantovano (Fig. 3 and Fig. 4).

[5] The Lombardy region, with 12 provinces, has a total of 1507 municipalities (Data at 1 January 2019, source: ISTAT). Among these, 1035 are classified by the Law 6 October 2017, n. 158 as Small Municipalities (population of fewer than 5000 inhabitants), with an incidence of 68.68% in relation to the entire national territory's data.
These are mostly concentrated in mountain areas, but also many areas of the plain.

[6] Project E/MIGRATE: community-supported historical centers. Regenerating cultural heritage for sustainable hospitality received funding from FARB program 2016. The multidisciplinary team is formed by Politecnico di Milano, S. Pistidda (scientific manager), E. Bersani, M. Giambruno, Y. Mastromattei, L. Ottolini; Istituto Europeo di Psicotraumatologia e Stress Management (IEO), R. E. Fioravanzo. The research wants to explore the possibilities to interlink two parallel issues. From one side, the depopulation phenomena affected many inland areas, and the other the discussed topic of migrant hospitality. For further information, see http://www.e-migrate.polimi.it/.

Tab. 1
Table of the relationships between the number of Municipalities in each Province and number of ones with significant depopulation phenomena (elaboration by authors on Istat data).

Provinces	Number of small Municipalities	Number of Municipalities with significant depopulation phenomena from 1951 to date
VARESE	89	4
SONDRIO	71	38
PAVIA	164	125
MONZA BRIANZA	9	0
MILANO	35	1
MANTOVA	40	30
LODI	53	26
LECCO	72	16
CREMONA	103	73
COMO	117	39
BRESCIA	134	61
BERGAMO	167	62

A further investigation explores the Provinces and Municipal scale, highlighting the relationship between a number of small Municipalities and significant depopulation phenomena (Tab.1).

This first screening represents a useful instrument to identify the more critical areas. On these, more investigations can be developed to discover the depopulation process' causes, the characters of built heritage, and its potentialities to counter the phenomena. The province of Lecco was been used as a test to experiment the different steps of the process as main actions. The data collection on the main topics, applied to a specific case study, permits to define the elements on which focus the attention.

In the selected areas, the first action consists of the verification of all databases (regional and local) to collect information about the history, the territorial risks, the policies (the plan of government of the territory). From this action, it's possible to extract thematic maps that give an overview of the territory according to different insights.

A second and useful action directly involves local administrations, well aware of their territory's potential and criticalities, producing a sort of "self-assessment". Simple factsheets

to send to the Municipalities allow collecting detailed information on the condition of the built heritage and the availability of free buildings. These data can be compared with different municipal and supra-municipal scale realities to offer general guidelines. The goal is to collect homogeneous data, organized in the form of a factsheet, to sensitize the municipalities to interpret their places in terms of a possible, stable repopulation, making the different aspects comparable. The document has to be organized in a simple way to allow for quick compilation, considering that small villages often have limited staff and, therefore, little time to devote to extra work.

The first part of the form provides the collection of general data such as the number of hamlets present in the municipal area, the average age of the inhabitants, the number of foreign inhabitants.

A second part, filled for the main centers and the hamlets, has the purpose of collecting information about the services present and, if absent, information about the distance needed to reach them.

Specifically, for the hamlets, which suffer most from depopulation, the following information is required:

- the resident population;
- the distance from the main center and the ways of connection with it;
- the presence of infrastructural networks;
- the possibility of internet connection;
- the urban system and the quality of public spaces;
- the existence of public buildings and their level of occupancy;
- the state of abandonment of existing buildings (as a percentage);
- the presence of buildings in severe conditions and second homes.

The data collected permitted to define a general information sheet about the places' conditions, the potential, and the critical issues concerning the return of new, or old, inhabitants.

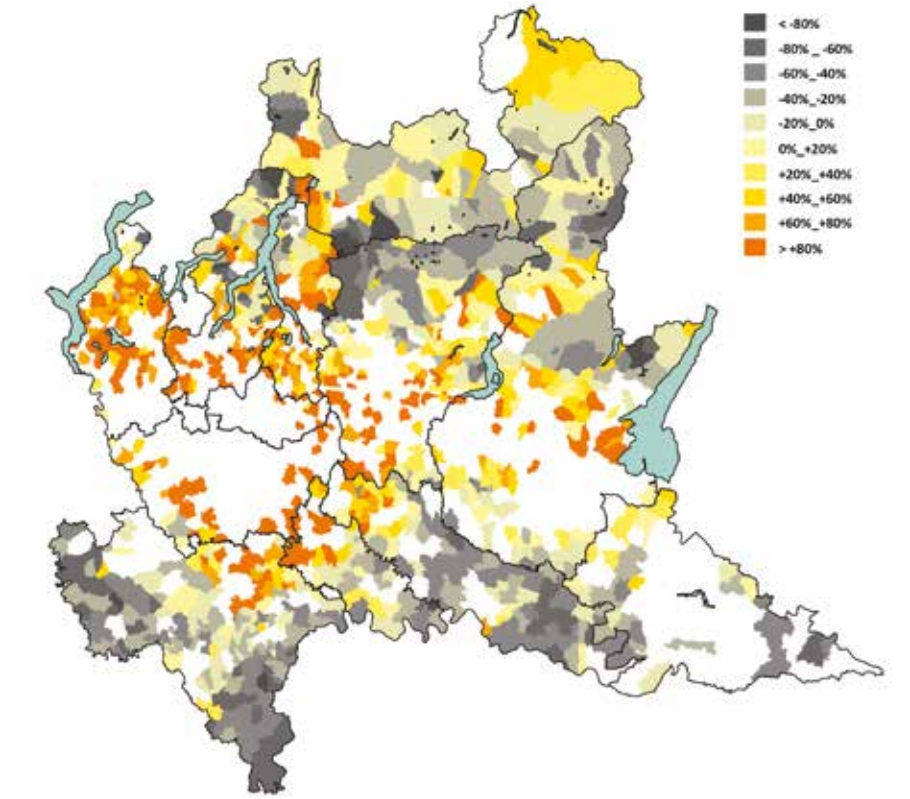
This action was experimented in the territory of Valsassina: only a limited number of municipalities[7] responded to the data collection by filling in the form. Therefore, it is a little sample, but it has provided some first indication of the consistency of these marginal areas. As reported by Municipalities, there are second homes (40% in the village of Primaluna) and buildings in a severe state of conservation. Vehicular and pedestrian paths connect all the hamlets to the main center. Essential services and infrastructural networks are present or reachable in a short time.

[7] Cassago Brianza, Malgrate, Primaluna, Sirone and Tremenico.

Fig. 3-4
Maps of the Lombardy region show the division of the Provinces and the distribution in percentage of depopulation phenomena. Elaboration by authors on Istat data (http://www.e-migrate.polimi.it/).

The investigations in Valsassina and Valvarrone (province of Lecco) underline that the total abandonment of the marginal villages mainly concerns those municipal districts once intended for mountain pastures or, in any case, not reached by driveways and located in arduous positions.

For the area identified as more critical in terms of depopulation, some site surveys are necessary to understand more the territorial and buildings characters, particularly the state of preservation and use of the built heritage, information not available from other documentary sources. This action permits constructing a more precise map focused on the built heritage as a starting point and resource (many of these centers already have excellent urban quality) for the reactivation policies (Fig. 5 and Fig. 6).



These initial reflections and data collection offers the opportunity to reflect on some questions that can open successive research paths. Is it possible to build a tool that "measures" an abandoned village's opportunities to reverse this trend and become vital again? The definition of a sort of "reactivation potential" could help to concentrate the resources, always scarce, on a specific place that can act as a driving force for triggering virtuous reactivation processes on a broader territory. A concrete action plan is needed to make this return truly possible. Firstly, we need to accelerate the resolution of structural issues, but it is also necessary to reflect on the places. Due to endogenous resources and structural conditions (built heritage conservation, service network, ongoing policies), not all sites have the same possibility of being regenerated. Identifying a sort of "reactivation" potential could be a useful tool for the administrations for targeting the interventions and direct resources and funding correctly (Fig. 7 and Fig. 8).

Fig. 5
The Municipality of Pagnona in Alta Valvarrone. Photo S. Pistidda, 2019.

Fig. 6
The Municipality of Tremenico (Province of Lecco). Photo S. Pistidda, 2019.

Fig. 7
The Municipality of Tremenico with the ancient hamlet of Fenile (Province of Lecco). An ancient building recovered as second home. Photo S. Pistidda, 2019.

Fig. 8
Municipality of Margno (Province of Lecco), an old building refurbished. Photo S. Pistidda, 2019.

Future steps. Towards a possible "reactivation potential" of the abandoned villages

The experience conducted in the Lecco province allows us to read some dynamics common to many parts of our country. First of all, the depopulation phenomena, even in the most densely populated region of Italy, is concentrated in the so-called small municipalities and in particular in those that are marginal to the main roads. Secondly, the abandonment by the inhabitants is frequently contrasted by a recent residential development concerning the construction of second homes with, in some cases, an equal percentage between permanent and temporary residences.

Another essential issue still emerges from the territories examined: there is no real and in-depth knowledge of the widespread architectural heritage of these villages, not necessarily in public ownership, nor about its state of use and preservation.

In-depth knowledge of these territory' characteristics (geographical position, services, and distance from them, consistency of the built heritage) can help identify a sort of "vocation for use" implicit in every place. This awareness could better guide the strategic actions to implement for their "revitalization". Reflecting with the resident population and local administrations on the role that their municipality could have in the territory starting from an in-depth and shared knowledge of its characters could be a first step building a sort of checklist. This tool can make evident and shared the place's potential and leads to awareness of its criticalities.

Building a checklist, a pre-filled tool from which each reality can understand its "position" within a broader context, is not simple.

This way should take into account the specificities of the place but at the same time, allow comparison with different contexts on a territorial scale. This would enable homogeneously collecting data to have a unique and comparable reference framework. Furthermore, the checklist should stimulate with its filling new visions of the territorial potential that often those who live there don't have due to the habit.

The ongoing research aims to continue constructing a checklist with these purposes, to proceed towards the self-definition by local realities of that 'reactivation potential' mentioned above.

In fact, from one side, it is not possible to describe the complexity of a territory and the historical signs with a numerical value. Undoubtedly, the awareness of those who already live in these places is a fundamental step to develop bottom-up strategies, no longer based only on the "emergencies" of the historical heritage and the consequent tourist flows but focused on the built heritage as a whole, as a resource for a quality and sustainable life.

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A METHODOLOGY FOR THE SEISMIC RISK ASSESSMENT OF POMPEII'S ARCHAEOLOGICAL SITE

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The Foro of Pompeii.

Since the discovery in the Eighteenth century, the archaeological site of Pompeii - and in general of the Vesuvius centres - has been, and it is still today, the field of a battle, which attempts to ensure the survival of ruins. These artefacts are characterized by "fatigued" materials, have not roof structures and, therefore, are lacking in constraints. Furthermore, they are exposed to the strongly aggressive atmospheric pollution of the cities of the 21th century and are located in areas where the expected ground acceleration values are of medium degree. Moreover, the methods necessarily of "integral" conservation aimed at preserving both the material and the original configuration allow "soft interventions" that moderately improve the response of ruins to the stresses deriving from gravitational loads and, primarily, from seismic actions.

This paper is framed in the context of the research project *Analysis, interpretation and evaluation of the seismic vulnerability of the construction elements constituting the archaeological apparatus of the Pompeii site*, signed in March 2018 between the Department of Architecture of the University of Florence and the Parco Archeologico di Pompei.

The herein contribution is aimed at describing the methodology used for the definition of a thematic reference map, based on the definition of the values of the site risk indices. Preliminarily, the developed methodology includes investigations on the seismic behaviour of the single construction elements - arches, vaults, colonnades, free walls and walls with various types of constraints, non-structural elements etc. - in their variability of geometry, masonry organization and material characteristics, crack and deformation pattern. The evolutionary aspect of the construction, with particular regard to the strategies put in place by the ancient Romans to repair or reinforce the damaged buildings, is also taken into account. Such a detected potential level of damage, in terms of limit states, will be obtained through calculation codes (some of them have also been developed by the authors) developed to predict the behaviour of ancient artefacts. Subsequently, the achieved data will be related and implemented considering the occurrences of single construction elements in the archaeological site, the interactions with contiguous buildings as well as possible site-effects, thus creating a seismic risk map for each individual *insula*.

Keywords: Pompeii; Archaeological Ruins; Seismic Vulnerability; Seismic Risk Zoning

Introduction

Unlike the numerous studies on historical centres which have been deeply addressed, the seismic risk of archaeological sites is a topic not much discussed in the scientific literature. It represents a complex assessment aimed at mitigating the vulnerability of ancient artefacts to earthquakes and, therefore, to reduce the loss of inestimable historic and artistic heritage.

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This research aims at describing a methodology useful for assessing the potential damage level, as limit states, for each constructive typology, that can be identified in the archaeological site of Pompeii, in order to draw a map of the seismic hazard of the area.
Buildings of archaeological sites usually lack constructive portions, thus bearing witness to the events of their long life. Cracks and deformed configurations are clear signs of past earthquakes, but also determine high vulnerability levels to upcoming seismic actions and makes archaeological remains completely different from other historical centres. Such conditions led to the development of a specific methodology for the seismic vulnerability assessment of archaeological remains.

Methodology for the seismic vulnerability index of archaeological remains

The existing procedures for the seismic vulnerability assessment of historical centres are based on the observation of damages[1] or the prediction of damages through numerical procedures (Vulnus, Famive etc.). The proposed methodology relies, instead, on the analysis of geometrical and constructive characteristics of archaeological remains and on historical records reporting the effects of the main earthquakes which struck Pompeii through centuries. In particular, the seismic events of the I Century A.D. and the 1980 earthquake are considered, taking into account the differences between the ancient and current condition of buildings. These aspects are compared, implemented and completed with information achieved through proper numerical analyses suited to the prediction of the mechanical behaviour of masonry constructions in archaeological sites. Some of the numerical procedures were developed by the authors.
The proposed methodology consists of five steps:

1. Identification and classification of specific constructive typologies: vaults, colonnades, isolated walls, walls with different constraint types and non-structural elements.
2. Classification of parameters of seismic vulnerability for each structural typology in **four** groups (A to D in table 1) by means of an in-depth survey - i.e., building techniques, materials, quality, plan regularity, height regularity, dimensions and locations of the openings, constraints, conservation status, structural reinforcements -
3. Attribution of different weights to each parameter considering the system of elements that determines the response to seismic actions.

[1] GNDT (2010) GNDT-INGV II Level Form for Masonry Buildings, in Italian, Department of Civil Protection; Grünthal, G. (ed.), (1998), European Macroseismic Scale 1998 (EMS-98). Cahiers du Centre Européen de Géodynamique et de Séismologie 15, Centre Européen de Géodynamique et de Séismologie, Luxembourg.

4. The proposed vulnerability index corresponds to the sum of these parameters, according to equation (1):

$$\left(I_v = \sum_{i=1}^{8} v_i \times p_i \right)$$

where v_i are the vulnerability parameters and the p_i the corresponding "weights". As reported in table 1, I_v ranges from 0 to 270 according to increasing vulnerability levels.

5. Computation of the expected damage starting from the vulnerability index. Adapting the classification proposed by Grunthal (1998), five possible damage levels can be obtained, denoted as Dx, where x = 1 to 5:

- D1: slight structural damages, material expulsions, fall of small pieces of plaster and possible cracks in frescos and stuccos;
- D2: detachment and fall of plasters and stuccos, beginning of out-of-plane mechanisms of columns and walls, occurrence of sliding drums in columns due to slenderness and constraint conditions;
- D3: slight cracks in walls characterised by fixed edge constraints, overturning of freestanding columns and consistent rotation of wall panels;
- D4: overturning of isolated walls, partial overturning of walls with edge constraints, collapse of columns, extensive cracks in walls;
- D5: severe damages involving both structural and non-structural elements and collapse of the entire building. (Fig. 1)

Historical survey

In the following paragraphs the main effects of the earthquake of the 1st century A.D. and ~~of~~ the 23rd of November 1980 are listed. Data have been collected from the scientific literature[2] and through direct observation.

1st century A.D. earthquakes

Overturning of isolated wall panels can be considered the most recurrent mechanism of this period. In fact, until the Julius Claudian age, the lack of constraints was a widespread condition of wall panels. Collapse mechanisms of the structure subdivided into rigid portions are anyway recorded, highlighting that connections between orthogonal walls were present. The most vulnerable constructions resulted to be the Eumachia building, the Vespasian's

[2] Ministero dei Beni Culturali, (1982). Bollettino d'arte. *Sisma 1980. Effetti del patrimonio artistico della Campania e della Basilicata*, in «Bollettino d'arte», serie VI, 2 supplemento; Ruggieri, N., Galassi, S., Tempesta, G., (2018). Pompeii's Stabian Baths. *Mechanical behaviour assessment of selected masonry structures during the 1st century seismic events*, Int. J. Archit. Herit., 12(5), 859-878, doi.org/10.1080/15583058.2017.1422571; Ruggieri, N., (2019), *Prima di quel giorno a Pompei*, Aracne Editore: Roma.

Fig. 2
The Stabian Bath.

Fig. 3
The façade of the Paquius Proculus' domus.

Temple and the Macellum, due to the considerable length of their walls and the absence of intermediate constraints. Some front elevations, built with calcareous ashlars arranged with isodomic technique, reported minor damages. For instance, the Casa del Chirurgo is still well preserved, nonetheless a slight out-of-plane of the façade can be observed nowadays.

The east part of the *destrictarium* of the Stabian Baths is nowadays still deformed. The thrusting action of timber roof beams and the hammering of the first floor of peristilium provoked the activation of damage mechanisms, which were also characterised by partial collapse of masonry. The lack of interlocking between orthogonal walls and the large opening of commercial units probably caused the overturning of the façade on via Consolare. In-plane damages are highlighted by the indenting interventions carried out before 79 A.D., which allow to interpret the crack pattern, as can be observed in the façade of Paquius's Domus on via dell'Abbondanza (I,7,1). (Fig. 2), (Fig. 3).

The earthquake of the 23rd of November, 1980

The earthquake, with epicentre in Irpinia, produced widespread damages on the archaeological site of Pompeii, especially in Regiones VI, VII, VIII (that had been excavated

earlier) and Regio I. Partial rotations and collapses affected mostly rubble masonries, such as in the Casa della Statuetta Indiana (I, VIII, 5) and in II, I, 8. Material expulsions, which especially occurred from the top of wall panels, affected the seismic response of some masonry walls (Giulia Felice's House). The presence of horizontal roof coverings reduced the overturning phenomenon and provoked the occurrence of cracks, as observed in the tuff masonries of Pansa's House (VI, VI, 1). The Fauno's House and the Labyrinth House, as well as other villas belonging to prosperous families, reported slight damages.

Columns behaved differently, according to their constructive feature, such as height and constraint conditions. Instead, regardless of their contractive features, collapse occurred for free-standing columns (Peristilium of the Siroco's House). Conversely columns still supporting the lintel were affected by slighter damages, characterised by the beginning of their overturning, clearly visible by their current leaning configuration (Eastern colonnade of the Forum). Furthermore, dislocations of single drums were observed (Triangular Forum). Columns of in-plane complete porticoes, with reconstructed timber roofs, were not affected by damages, also due to the presence of parapet walls between columns that have reduced their slenderness (Villa dei Misteri).(Fig. 4)

Tab.1
Parameters for the evaluation of the vulnerability index Iv, with increasing vulnerability from A to D1.

Vulnerability Parameters	A	B	C	D	Weight (p)
Building techniques and materials (v_1)	0	5	25	45	0,75
Quality (v_2)	0	5	25	45	1,00
Height regularity (v_3)	0	5	25	45	0,75
Plan regularity (v_4)	0	5	25	45	0,50
Location and size of openings (v_5)	0	5	25	45	0,50
Constraints (v_6)	0	5	25	45	1,00
Maintenance state (v_7)	0	5	25	45	1,00
Reinforcements (v_8)	0	5	25	45	0,50

Fig. 4
Villa dei Misteri, the internal portico.

Geological survey and site-effects

The geological stratification is composed by 6 to 8 meters deep upper layer, constituted by fall-out deposits, mainly cemented pumices and ashes. Underneath the upper layer, there is a lithoid bench that emerges in different areas of the south front. Site morphology is characterised on the south-east boundary by hills, with around 5% slope and 35m height above the sea level. A cliff delimits, instead, the south boundary of the site. According to the seismic classification of the Italian territory, updated in March 2015, Pompeii is classified in zone 2, which means that expected ground accelerations are of medium intensity and vary between $0.015a_g$ and $0.25a_g$. Nonetheless, strong earthquakes are possible, even though the archaeological site is far from the seismogenic areas of the Apennine and the seismic intensity may be mitigated by geological stratigraphy. A quite homogeneous geomorphological and stratification structure of the area prevents local amplification of seismic waves.

Parameters of seismic vulnerability

Different materials and building techniques have been employed in Pompeii trough centuries. Consequently, materials and brickwork vary according to the construction period

of buildings. The Archaic Age (VI-V cent. B.C.) and the Sannitic Age (IV-III cent. B.C.) are characterised by sedimentary or magmatic stones arranged in *opus quadratum*, which proved to have a good behaviour under seismic actions. Afterwards, until 79 A.D., walls were usually made by a cement fill with two facings - *crustae* - arranged in *opus reticulatus*, *opus mixtum*, *opus latericium* or *opus incertum*. Clearly, the seismic vulnerability of these walls is tightly dependent on the binder quality of the cement infill. The classification for the attribution of vulnerability coefficients was carried out taking into consideration both the brickwork typology and its compliance with the rule of the art. In fact, public buildings and those belonging to the affluent classes show a higher quality of materials and construction technologies. Plan and height irregularities are also considered as vulnerability parameters. Residential and commercial buildings were usually up to two storeys high and had a plan and height regular distribution of masses and stiffnesses. (Fig. 5)

The basic residential building typology is the *atrio* house[3], where rooms develop from the internal core, represented by the *atrium*, and are arranged with an axial or centripetal

[3] Maiuri A., (1958), *Pompei ed Ercolano: fra case e abitanti*, Napoli.

Fig. 5
Opus quadratum characterizes the walls of Vesonio Primo's House.

disposition (Casa del Chirurgo, VI, 1, 9-10). These floorplans often result in a bi-axial symmetry, where the centre of gravity matches the centre of stiffnesses, largely preventing torsional effects during seismic actions[4]. A similar symmetrical arrangement of rooms can be observed in the Stabian Baths (VII, 2), around the inner *peristilium*, where resisting masses are disposed on the boundary of the building. Nonetheless, not all buildings are compact and symmetrical. Due to various modifications occurred, the Sacerdos Amandus' House (I,7,7) has an irregular shape, which determines non-uniform dynamic load distributions, and consequently a high local demand for ductility.

Another key aspect for building seismic response is the presence and disposition of the openings, that influence the shear stiffness of walls. In this regard, the wide entrances of the *tabernae* are clearly vulnerable features.

The lack of constraints between transversal wall panels is a common condition in Pompeian construction. Frequently, corners and joints between main and orthogonal walls are built without an effective connection. Furthermore, existing constraints are wide apart. It is also to consider that partial collapse transformed many masonry buildings into

[4] Arnold C., Reitherman R., (1982), *Building configuration and seismic design*, Wiley: New York.

isolated walls. However, some buildings are complete thanks to recent restorations that introduced timber, metallic or brick-concrete floors and roofs.
The vulnerability to seismic actions depends also on the conservation condition of the structures. The presence of cracks and deformations have been considered in the analysis, along with the material decay due to the exposure to aggressive atmospheres typical of the 21st Century urban environment.
Furthermore, the contribution provided by reinforcements of the Roman age - such as buttresses and technical devices for bocks interlockings - or of the Borbone period and recent years - such tie-rods of different shape and materials - was also taken into account.

Conclusions

This research introduces a methodology for the assessment of the seismic risk in the archaeological site of Pompeii, which is currently subject to implementation and validation. Values of the vulnerability parameters are being calibrated by the authors[5] through specific calculation codes for the prediction of the seismic behaviour of masonry structures in archaeological sites.
The in-depth knowledge of the structural behaviour of archaeological artefacts is of extreme importance both to ensure the safety of visitors to the archaeological site but, above all, to prepare correct conservation interventions. The methods necessarily of "integral" conservation aimed at preserving both the material and the original configuration allow only "minimum" interventions that moderately improve the response of ruins to the stresses deriving from gravitational loads and, in particular, from seismic actions.

[5] Galassi, S., Ruggieri, N., Tempesta, G., (2018), *A novel numerical tool for seismic vulnerability analysis of ruins in archaeological sites*, Int. J. Archit. Herit., 14(1), 1-22, doi.org/10.1080/15583058.2018.1492647; Galassi, S., Ruggieri, N., Tempesta, G., (2018). *Ruins and archaeological artifacts: vulnerabilities analysis for their conservation through the original computer program BrickWORK*, in: «Structural Analysis of Historical Constructions», Aguilar, R., Torrealva, D., Moreira, S., Pando, M., Ramos, L.F. (eds.), RILEM bookseries 18, Springer International Publishing, pp. 1839-1848. doi.org/10.1007/978-3-319-99441-3_197, Proc. of 11th International Conference on structural analysis of historical constructions (SAHC2018), (11-13 September 2018, Cusco, Perù).

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AGRI-INDUSTRIAL DYNAMICS AND SETTLEMENT HERITAGE AT RISK. THE CASE OF THE ALBENGA SUB-REGION

Giampiero Lombardini
Università degli studi di Genova-Italia

Densification processes of the settlement and rural areas (growth of greenhouse plants) in contemporary times - Source: GIS elaborations by the author of Liguria Region cartographic data.

The Albenga agricultural plain, together with the hilly territory of the valleys that converge into it, today is one of the most dynamic economic areas in Liguria. The long-standing tradition that has seen this peculiar regional area characterized by a strong agricultural component (competitive at national level and not only) has profoundly modified, starting from the post-war period, the settlement structures of the entire urban region, historically identifiable in the city of Albenga and in the settlements connected to it, as one of the most ancient Ligurian settlement environments. The intensive use of the land for agricultural purposes and then for productive and tertiary functions of the plain has determined the detriment of the more inland (in abandonment) valleys. Land take, conflicts in land use, environmental instability, abandonment of small inner villages, give back today the picture of a territory that is experiencing an environmental-settlement crisis that threatens the possibility of maintaining balanced economic and social arrangements. So, the urbanization and the agri-industrialization processes of recent decades has radically changed the original morphology of territorial systems. Recognize the traces of long-term urban form, first of all at a large scale (and then at the medium territoral scale), can help land planning actors in order to make settlements more sustainable and resilient. The aim of the paper is, in a fist step, to analyze the long-term urban plan for the territory of Albenga area. Settlements are analyzed together with the basic territorial structures that have generated them during the historic long period. The study starts from the diachronic reading of cycles of territorial development that have gradually formed the present settlement. The matrix elements that determine the shape of the settlements are, in the first instance, the paths and the plots (including land uses), detectable by comparing different historical maps. Subsequently the different built forms are classified into "morpho-territorial typologies". The representation of the settlement into different temporal stages is the result of processing carried out through the use of GIS and simulation models based on cellular automata and multi-agent systems. In a second step the contribution, starting from the the infra-regional scale, the contribution attempts a reconstruction of settlement dynamics during the period 1981-2020 which tends to highlight the constant loss of patrimonial value of the valley settlements (abandonment of the villages and shrinking of agricultural production areas, economic impoverishment of the most internal areas), is associated with an analysis of the local economic cycles which led to a transition from a condition of balanced polycentrism to a dissipative dispersion. The relationships that link economic dynamics (socio-economic production models), which in turn generate specific patterns of land uses and spatial configurations of the settlement constitutes the central nucleus of an infra-regional metabolic model centered on the assets and the risks associated with them.

Keywords: Settlement cycles, territorial heritage, risk, abandonment, regional modelling.

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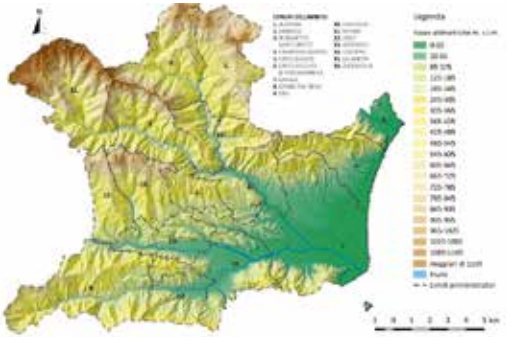
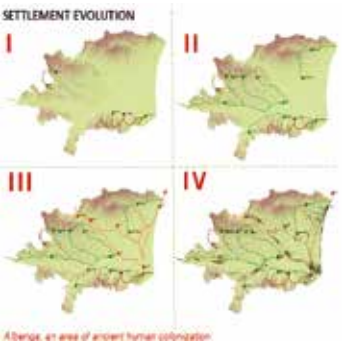




The Albenganese area (province of Savona) - Source: GIS elaborations by the author of Liguria Region cartographic data.

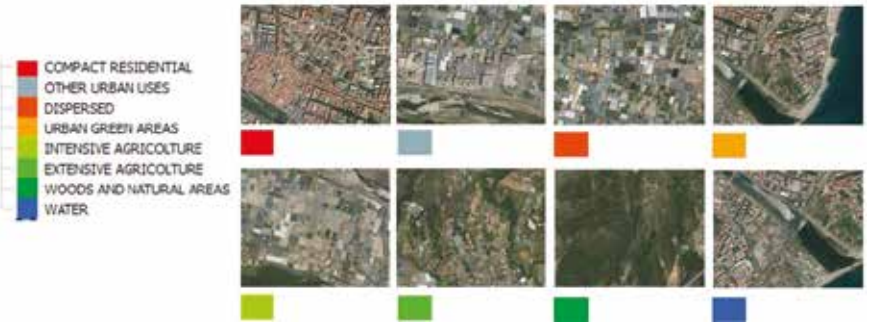
Territorialization cycles in the Albenganese area - Source: author's elaborations on Liguria Region cartographic data.

The study area: the Albenga valleys

The study area concerns a western region of Liguria (Albenga), characterized by the presence of an important coastal plain that was formed, from a geomorphological point of view, by the confluence of some mountain streams. It is one of the few flat areas in Liguria and its shape has influenced the forms of settlement over the centuries. The area is represented by the municipalities of the coastal cities and town of Albenga, Borghetto, Ceriale and the four valleys that make up the catchment area of the Centa river: the Lerrone valley, the Arroscia valley (limited to the Savona portion), the Pennavaira valley and the Neva valley. The four valleys have, within them, changing morphological and vegetational characters (Stringa, 1980): in particular, the latter aspect is closely connected to the exposure of the hilly slopes of the valleys. In fact, on the south-facing slopes there are crops, especially vines and olives; the northern slopes are characterized by chestnut woods or various essences. While the Lerrone and Arroscia valleys have wider and more inhabited landscapes, the Pennavaira and Neva valleys are wilder and with steeper slopes. The Lerrone valley rises from Villanova d'Albenga (where it joins the Arroscia valley) towards the Impero and Merula valleys (which it joins at the Ginestro pass), passing from the flat Villanova area to the hilly one of Garlenda and Casanova Lerrone. Most of the residential fabric is located on the south-facing slopes, as well as the most valuable crops of vines (especially in the municipality of Garlenda) and olive trees; on the north-facing slopes prevail the woods of various species such as oak, black hornbeam and ash, Aleppo pine and maritime pine, chestnut, as well as areas covered with tall scrub with strawberry trees and heather and shrubs with thorny broom and fragrant broom. In the portion of the Arroscia valley considered (limited to the Savona area), characterized by the presence of the municipalities of Ortovero, Onzo, Vendone and part of the municipality of Arnasco, the presence of man and agricultural activity is much more evident, however,

even here, in particular on the hilly slopes it is possible to find alternation of vineyards (especially in Ortovero) and olive groves with black hornbeam woods, various types of oak, maritime pine, black alder wood (riparian formation along the course of the stream). Unlike the wide and intensely inhabited landscapes of the Lerrone and Arroscia valleys, those of the Pennavaira and Neva valleys are very discontinuous, very steep and still wild. In the Pennavaira valley, in addition to olive groves and chestnut groves, there are woods of black hornbeam and ash, various types of oak, black alder wood.

Observing this territorial area, it can perceive the contrast between the agricultural environment of the flat area and that of the foothills and mountains. The territory of the district can in fact be divided according to three altimetry: the one between sea level and 50 meters above sea level, the one located between 50 and 150 meters above sea level and finally the real hilly and mountainous one. The flat portion of the area is located below 50 m above sea level, characterized by irrigated crops as well as by artifacts and structures deriving from the industrialization of agricultural activity, while between 50 and 150 m the foot-hilly area hilly, sees the dominance of the terraced territory with olive and vine crops. Above 150 meters, the hilly and mountainous landscape is mostly characterized by woods and bare rocks. One of the factors that unites the two areas is the presence of a strong pulverization of the agricultural property. A more in-depth analysis of the causes, which led to this fragmentation, highlights the substantial difference between the phenomenon in the two cases mentioned: in the plain, the agricultural division is the result of huge investments made on agricultural areas to intensify their exploitation (seizing the opportunities resulting from particularly favorable climatic conditions); in the hills and in the mountains, on the other hand, the physical component dominates, therefore the agricultural plot is obtained through the work of generations of farmers who cultivate the land even without obtaining surplus (except for olive and vine crops) and therefore coming to configure economies of mere family-based subsistence. These general conditions, the result of the symbiosis between man and the environment, also determine the characteristics of the settlement, organized according to two fundamental settlement typologies: the rural nucleus, composed of a fairly high number of dwellings (from 100 to 200) and with a rural area of rather large relevance characterized by a strong land splitting but by little or no presence of rural artefacts (except for small agricultural warehouses) and the agricultural 'villa', characterized by the unification of a few residential units within modest or very modest nuclei dimensions (with areas of agricultural relevance of much more modest size, characterized by terraced land arrangements consisting mostly of dry stone walls).



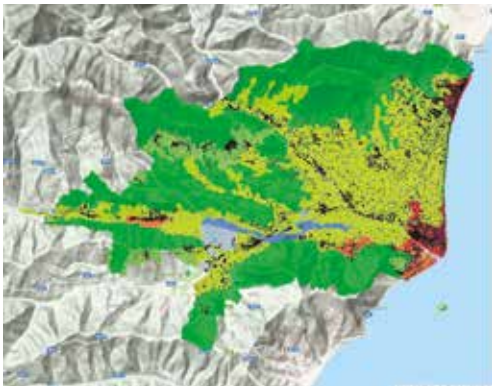
Both the land uses in the study are vector data and we've classified land uses into 8 categories.

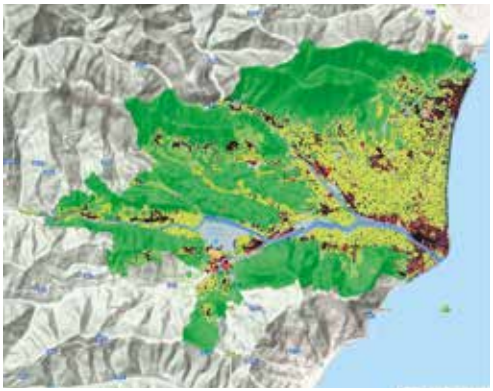
Land use changes 1992 -2015.

History of human occupation: the territorial cycles

The history of human occupation in the area is very ancient: if in Roman times the area had been characterized by an intense process of colonization (Albenga is a city of Roman foundation), the first settlements date back to at least a millennium prior to this phase. Subsequently, the lively agricultural and productive characteristics have been maintained and consolidated to this day.

The first phase of the settlement structure (3,000-2,000 years ago) is characterized by the presence of small residential areas on the hills, near the ridges (inhabited areas of the promontory). The second phase of the evolution of the settlements is characterized by the descent towards the valley of the settlements and the progressive occupation of the hills. This is the period in which large terraces are built for the cultivation of mainly olive trees but also, in this area, for horticultural products, fruit trees and, not rarely, arable land. It is the period (between 1000 and 1200) in which agricultural production consolidates and specializes. The paths that now descend from the ridges become valleys and intervals along the coast. The first long-distance foothills routes were also built. The third phase is characterized by the intensive occupation of the flat areas of the valleys. The agricultural structure now tends to occupy all the flat coastal areas and valleys, thanks to the drainage of the previously marshy areas and economically takes over the rest of the territory, to the detriment of the valley centers which are beginning to see important migratory flows towards the plains. and the coastal valley floors. The road network becomes dense and urban centers also increase in rank (population, markets, activities). In this period (1300-1950) a phase of organization of the territory also begins, which focuses on some new urban centers of foundation. The fourth phase coincides with the urbanization process of the modern era. Based on the settlement structures built in previous periods, agricultural activity becomes more and more intensive (industrialized agriculture)



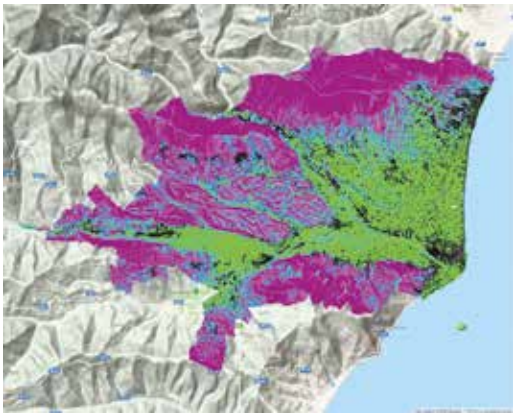


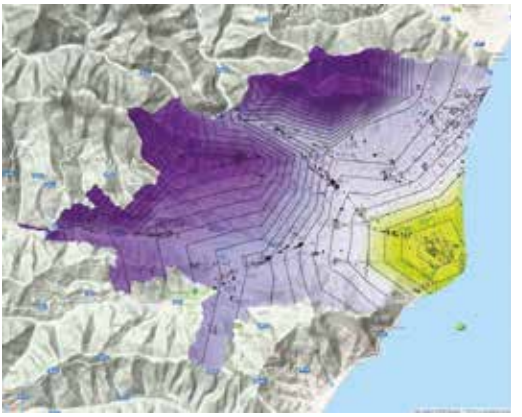
and this primary activity is flanked by various other functions such as trade and industry (mainly linked to the agro-food chain), which tend to occupy large areas with increasingly larger buildings.

As regards the period from the end of the Second World War to the present day, we can recognize two phases. The first phase of the modern era (1950-1975) is characterized by the strong presence of traditional agriculture conducted on small plots. Production is mainly concentrated on fruit and vegetables and the outlet market is mainly local. The other activities (which materialize in specific uses) are weak, with the exception of the residential function which emerges sharply during this period. The overall population is increasing (from 12,000 to 19,000 inhabitants). The second period (1975-1995) is characterized by a strong conversion of agricultural activity towards industrialized forms of production with large growth of greenhouse plants and specialized crops. Agricultural activities are now flanked by productive and commercial functions (which often compete with agricultural land) which tend to occupy large spaces, especially near main roads.

The quantitative growth of buildings continues. The population continues to increase, but at a slower rate: from 19,000 to 21,000 inhabitants. The third period (1995-2015) is characterized by a strong expansion of the tertiary sector, productive and commercial functions to the detriment of the rural area. More specialized agriculture resists and consolidates, but agriculture conducted in more extensive forms, on the one hand is replaced by new urban activities (increasingly widespread in the territory), on the other is subject to abandonment, with the consequent growth of forest and natural areas. The building development is remarkable and the population also continues to increase (from 21,000 to 23,000 inhabitants).

In contemporary times, therefore, the territorial structures (settlement fabric) are characterized by an increasingly accentuated post-metropolitan condition. The characteristics of



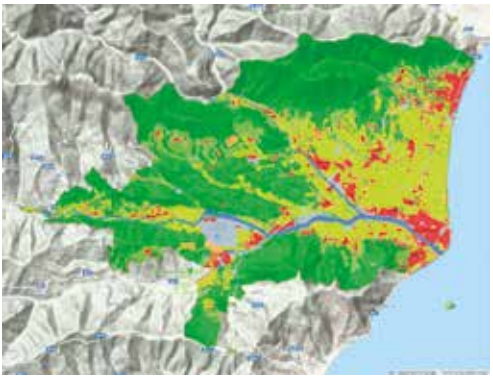


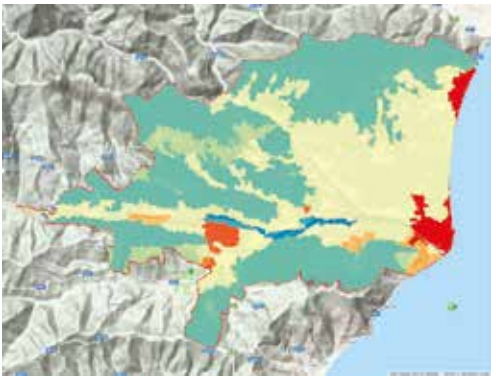
An example of two spatial variables (slope and accessibility).

Simulation model and land use changes projection.

this territory, as in other cases in Liguria and Italy, tend to be configured according to dynamics which, following the interpretation of E. Soja (2000), can be identified in a poly-nucleated urbanization, a substantial absence of dominant centers, a strong dispersion / diffusion phenomenon of the settlements, a constant fragmentation and segregation of land uses. The post-metropolitan territory (and the territory in general) can be read, in this case, as a succession of territorial settlement cycles. The material history of the territory is the history of the forms of its settlement and is not linear, but is characterized by cycles of innovation / consolidation, centralization / dispersion, occupation / abandonment, colonization / restructuring. Sometimes these settlement dynamics act simultaneously (they are synchronous), in other cases they alternate over time and differ in space (diachronic changes). The geographical space (the physical and morphological characteristics of the territory) conditions the different territorial cycles (especially the first cycles) which are always the result of an uncertain and unstable balance between population and environmental resources. The forms of settlement inherited from the past also condition future developments, sometimes placing themselves as constraints and sometimes as opportunities (reuse of previously modeled structures).

The post-metropolitan territory (and the territory in general) can be read as a succession of cycles of territorial settlement. The material history of the territory is the history of the forms of its settlement and is not linear, but it's characterized by cycles of innovation / consolidation, centralization / dispersion, employment / abandonment, colonization / restructuring. Sometimes these settlement dynamics act simultaneously (they are synchronous), in other cases they alternate over time and are differentiated in space (diachronic changes). The geographical space (the physical and morphological characteristics of the territory),





condition the different territorial cycles (above all the first cycles) that are always the result of an uncertain and unstable equilibrium between population and environmental resources. The forms of settlement inherited from the past also condition future developments, sometimes posing as constraints sometimes as opportunities (reuse of previously shaped structures).

Method for modeling land use changes

The most recent land use/cover change models are usually based on different empirical techniques (e.g., artificial neural networks, agent-based models, genetic algorithms) or statistical techniques (e.g., multi-criteria analysis, regression models) and underlying theories have significantly increased researcher's interest because they can (1) explore dynamic processes of the land use system; (2) build models of relationship among changes and spatial and non-spatial variables; (3) can make explicit the weight and the role that the different variables taken into account have in determining the changes in land use; (4) predict future land use development over space and time; (5) simulate trajectories of land use changes and feedback loops through the implementation of land use scenarios, and finally.

For the study of the succession of the different territorial cycles, the starting information base was constituted, by the analysis of changes in land use and land cover. Through the reading and analysis of variations in land use maps it is indeed possible to elaborate a description of the spatial structure of the settlement. The land use maps developed in this way are then the basis for developing simulations on possible future territorial structures. The method adopted allows to represent the dynamic settlement structure of a territory in an historic way, allowing to describe and observe the phenomena of centralization / dispersion, occupation / abandonment, colonization / restructuring.

Briefly, the workflow consists of the following steps:

Tab. 1
Spatial analysis of territorial cycles: steps of the proposed method.

Elaboration of data sets and land use and land cover maps in different time stages	Institutional open data maps, image interpretation of aerial photos, survey on site, GIS
Searching of the potential spatial variables	Spatial analysis thruogh GIS
Evaluation of the statistical correlation between land use change and explanatory spatial variables	Spatio - statistical indices: Pearson's correlation
Modeling the temporal transition rules between the different land use maps	Artificial Neural Network (ANN) (Multi-layer-perceptron)
Simulation of change through geosimulation methods	CA- Cellular Automata
Calibration and validation of the model results	CA- Cellular Automata

Tab. 2
Pearson's correlation among spatial variables.

Obtain landcover map for few time slices and a set of potential explanatory variables;
Calculate probabilities of transitions from class to class;
Build a model using ANN, logistic regression, Weights of evidence or Multi-criteria evaluation to describe transitions based on factor variables;
Use this model for forecasting;
Validate the result with real data.
More precisely, the proposed method consists of six processing steps:
A specific Plug-in of Qgis was used to model land use change: the so-called Molusce plugin. This plugin measures the percent of area change in a given year and provide transition matrix that shows the proportions of pixels changing from one land use/cover to another and the plugin carried out the area change map which present the change in the land, in our case staudy, from 1995 to 2015 in the 8 classes selected here. In order to run the simulation, MOLUSCE cam use Artificial Neural Network (ANN), Multi Criteria Evaluation (MCE), Weights of Evidence (WOE) and Logistic Regression (LR) methods. The result is to get a model of land use/cover transition potential. In this study it's been used the ANN method. A cellular-Automata Simulation was used in the plugin to forecast the change in land use based on the classified images. This model was based on previous change and not on any anthropogenic or natural processes.
In this study, the MOLUSCE was used to detect the change of land use between two period (1995 e 2015) and measure it by many variables such as slope, elevation, proximity to road network, accessibility. This study is also included a prediction of land use in the future, which is important to help urban planners in the process of decision making.

VARIABLES	Proximity	Accessibility	Slope	Elevation	Density	Form
Proximity road network	---	0,152	0,102	0,122	0,120	0,431
Accessibility to central city		---	0,507	0,613	0,537	0,356
Slope			---	0,635	0,372	0,238
Elevation				---	0,438	0,421
Settlement density					---	0,539
Settlement form						---

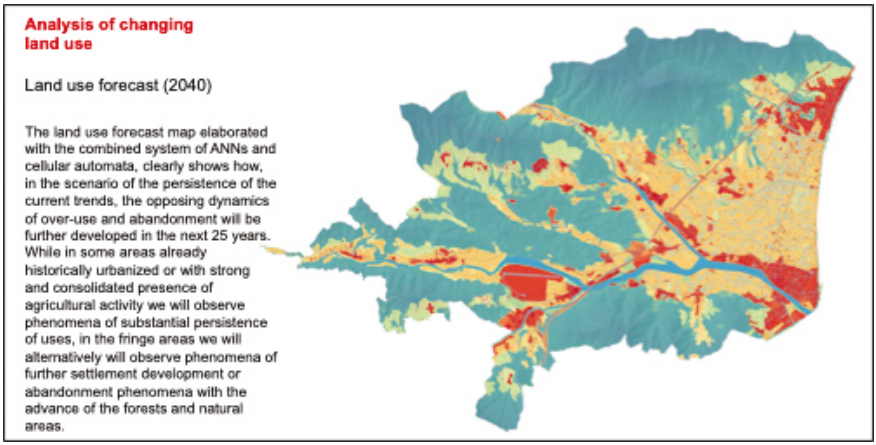
The data available for the period 1995-2015 allow us to calibrate a simulation model to realize some scenarios of possible transitions in land uses. Scenarios can be built starting from a definition of the main socio-economic trends (demographic, development potential of different economic sectors, development of innovative activities for the area - such as tourism -, the growth of alternative forms of agricultural production, such as those based on multi-functional agriculture.

The main objective of the study is to examine land use and land cover (LULC) change between 1995 and 2015 and to estimate expected changes in the future. The specific aims are:

1. To detect change in LULC between 1995 and 2015 and the role of this change on morphological settlement evolution
2. To produce a change land use map of the study area and carry out a classification of morphological modifications "types";
3. To trains a model that predicts land use changes from past to present
4. To predict future land use changes derived from the model and the correlation with the spatial previously variables selected.
5. To use Cellular Automata simulation model to forecast change in land use.

The dynamics that can be considered to develop such territorial scenarios can be the following:

- conditioning and constraints induced by natural morphological conditions;
- current structure of the settlement;
- road network and its development potentials;
- planning system;
- accessibility with respect to the main service centers;
- general demographic dynamics;
- temporal projection of the different production sectors.



Land use forecast (2040).

Two land uses of study area were created using Qgis. Then a set of spatial variables were built. They have had to be maintained first in QGis to be the same pixel size, coordinate system and fixed scale (nominally 1:10.000). Then entire these data were put into MOLUSCE (a Plugin of Qgis developed by Asia Air Survey) that used to obtain land cover change map and to establish the trend of change for the study area.

Operational steps and simulation

The land uses were used in the study were vector data and classified into 8 categories: compact residential, other urban uses, dispersed settlement, urban green areas, intensive and extensive agriculture, forest and natural areas, water. Most of spatial variables were loaded in vector format, where the MOLUSCE deals with raster data. So, first thing was to convert all vector data to raster data to be able to deal with plugin. Other terms to deal with plugin is to set the same coordinate system for all layers. Applied resample process for all layers to determine the same pixel size, in this study the pixel size chosen is 5 x 5 mt.

1. 1° step - Inputs - Data preparing

   The initial (period 1: 1995) and final (period 2: 2015) land use/ land cover maps as well as spatial variables such as slope, road proximity, elevation, and settlement shape are loaded in the panel of spatial variables. The land use/ cover change information and the spatial variable are been used for modeling and simulating land use/ cover changes in area-studio. In this step, it was crucial checking geometry if all inputs matched (pixel dimension, coordinate systems, scale and so on).

2. Evaluation correlation

   This step comprises three methods, namely the person's correlation, joint information uncertainty, and crammer's coefficient, which are used to check correlation among the spatial variables. The table 2 shows the correlation ratio between the five variables (slope, road proximity, elevation, built concentration and accessibility -isocrones-). It is noticed from the result that the slope and elevation layers are inversely related to the other variables, which are inversely affected. The roads often need an equal area in order to facilitate street construction. The other variables are linked by direct links.

3. Area change

   In this tab, land use/ cover change and transition probabilities are computed. Also land use/ cover change map produced. The land use/ cover units have been expressed in hectares.

4. Transition potential modeling

   The method for computing transitional potential map is Artificial Neural Network (ANN). This method uses land use/cover information and the spatial variable as inputs for calibrating and modeling land use / cover change. The resulting data show the correlation ratio between the six variables (slope, road proximity, elevation, built concentration and accessibility -isocrones-). It is noticed from the result that the slope and elevation layers are inversely related to the other variables, which are inversely affected. The roads often need an equal area in order to facilitate street construction. The other variables are linked by direct links.

5. Cellular Automata simulation

   To build simulation maps, Molusce uses as a method of projection (among others) a neural network. In order to develop a network with adequate predictive capacity, it was necessary to train and test the ANN with different input data. Training involves presenting input values and adjusting the weights applied at each node according to the learning algorithm (e.g. back-propagation). ANNs were applied to the prediction of land use change in four phases: (1) design of the network and of inputs from 5 spatial variables and a spatial historical map; (2) network training using a subset of inputs; (3) testing of the neural network using the full data set of the inputs; and (4) using the information from the neural network to forecast changes. Transitional potential map, certaincy function, and simulated land use/ cover maps are generated under this process. The cellular automata approach is based on Monte Carlo algorithm.

6. Simulation

   The MOLUSCE plug-in provides the tools to conduct an analysis of transformation potentials. In fact, starting from the change maps, the system "learns" through the ANN

which are the highest probabilities, for each pixel, of permanence of the present land use or of its variation (and in which direction this variation might take place). The rules that are built through the ANNs consider the spatial variables that influence changes and their weight. Through other tools, such as multi-criteria analysis or logistic regression, we could also build different hypotheses of relevance (correlation) between the spatial variables considered and the process of change in land use. All these techniques can lead to a progressive refinement of the model's ability to predict potential future uses with an increasing accuracy.

Conclusions

The Land Transformation Model presented in this paper examines the relationship between 5 predictor spatial variables and land use changes. The model performs with a relatively high predictive ability (46%) at a resolution of 5x 5 mt. By developing 5 versions of the LTM, each with one of the variables removed, we could assess the relative contributions of each variable on model performance. Similarly, if we set up simulations according to a different set of (spatial) variables (one set for each scenario), we could obtain different forecast results, processing a real scenario analysis. A set of alternative scenarios could then form the basis for carrying out preferential analyzes with multi-criteria methods.
Using the ANN pattern file generated for the study area, we've applied the network file created from the control run to create a file with changing likelihood values for each location in the entire area. In order to obtain a reasonable result, we made several assumptions. First, we assumed that the pattern of each predictor variable remained constant beyond all the period. Spatial rules used to build the interactions between the predictor cells and potential locations for transition are assumed to be correct and constant over time. Third, the neural network itself was assumed to remain constant over time. Thus, the relative affect of each predictor variable is assumed to be stable. Finally, the amount of urban per capita undergoing a transition is assumed to be fixed over time. Given the availability of data (e.g. new roads, more temporal information about land use change and other variables), it is possible to relax many of these assumptions in order to examine the potential effect each of these assumptions have on the performance of model forecasts. In general, the simulation model is able to represent forms and dimensions of the change in land use and therefore the settlement structure of the area, highlighting what could be important trends in the near future, where the size of the dispersed settlement will go probably growing up.

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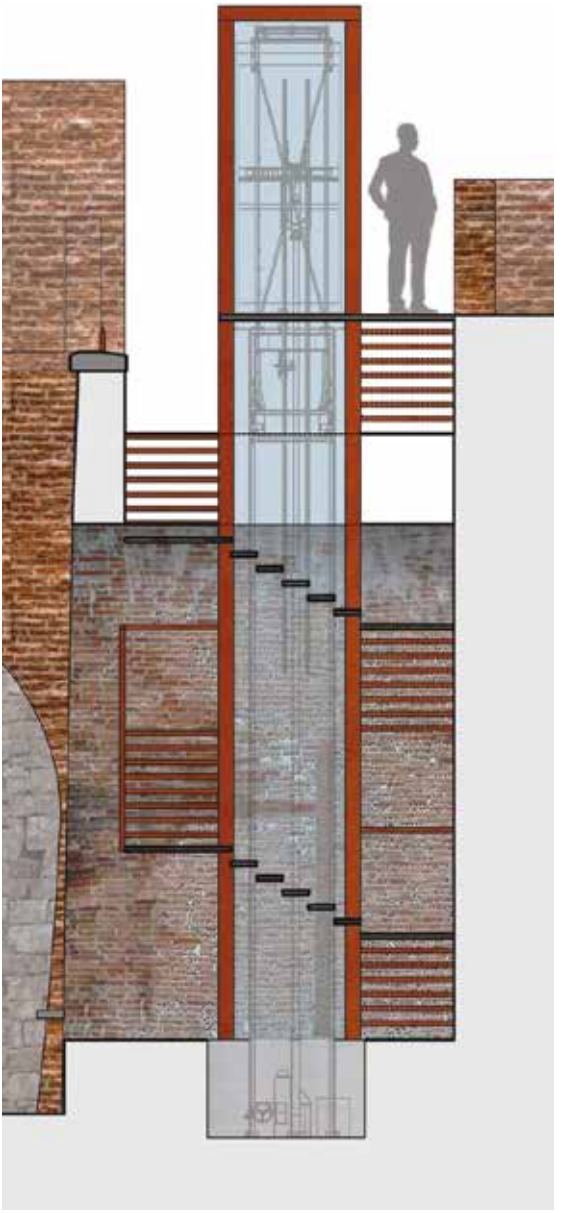


THE "CANTO DI STAMPACE" – A CASE STUDY FOR THE REQUALIFICATION AND URBAN RECONNECTION OF THE CITY OF PISA THROUGH THE ANCIENT DEFENSIVE STRUCTURES

Laura Marchionne, Elisa Parrini
Università degli Studi di Firenze-Italia

Design of the bastion area. a) New vertical connection integrated in the bastion.

The focus of this study is the architectural heritage in a state of ruin located in an urban context and its conservation and transmission to the future through the re-use strategy. The re-use strategy in architecture takes into account the change of use of existing buildings that is one of the fundamental aspects of restoration, thus arising thoughts on the need of giving value to standing constructions through adjustments towards new activities. In order to prevent building neglect, the re-use project becomes essential once its original function comes to an end. The city's ruins, which are historically and culturally considerable, from an urban point of view offer very limited new functions besides the contemplative one. Here rises the need of finding methods and tools that during the planning, the designing, the execution, and the operating phase could deal with the intervention choices respecting the pre-existent qualities.Deeply understanding a culturally and historically important building is the main requirement to manage a restoration project that does not just take care of its conservation but also its transformation to a component of the community once more.In particular, this paper focus on the extensive study of a case: the south-west section of the medieval city walls of Pisa including the Sixteenth-century bastion, so-called *Canto di Stampace*. Although over the past decades the area and the architectural monuments have undergone some restoration interventions, presently they are in a state of semi-abandon and consistent physical and social neglect.

Keywords
Ruins, Architectural heritage, Fortification, Re-Use, Integration

Introduction

This article focuses on a particular category of the architectural heritage: historical building remains in a state of ruin located in an urban context. As a matter of fact, in Italy[1] there are numerous examples of these artefacts, which would require an appropriate restoration and valorisation. They effectively represent interruptions, urban voids. A historical monument in a state of abandon is not merely a building that does not express its value, but becomes the exact opposite, in other words a negative value. The state of ruin is the antithesis of the final purpose of preservation, whose aim is to prevent – or to contain – the degradation process of an architectonic asset.[2] The negligence and inefficiency in the preservation and

[1] Carta del Rischio, ISCR.
[2] Rodrigues A., *Ruin and architectural heritage in Brazil: memory and oblivion*, São Paulo, 2018.

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Stampace bastion

Main iconographic sources.
a) Giorgio Vasari, The storming of the fortress of Stampace in Pisa, affresco, 1568-1571, Firenze, Palazzo Vecchio, Salone dei Cinquecento.
b) Giuliano da Sangallo, Unfinished plan of Pisa, Uffizi, 7595A.

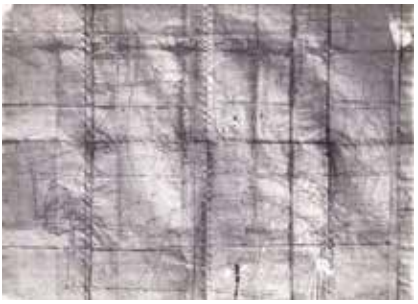
conservation of a cultural asset exemplify a dissipation of social and cultural values, a sort of negation of the historical memory.

Architectural heritage constitutes a physical source of information, the material traces of our historical memory. The state of ruin is characterised with an intrinsic sense of fragmentation. However this does not undermine the artefact ability to testify the human history[3]. In fact, as Cesare Brandi[4] teaches us, a fragment can refers to the whole, especially if it is framed in an adequate knowledge of the subject.

Promoting cultural heritage awareness and knowledge is fundamental, as also stated in Art. 9 of the Italian Constitution. First of all, the valorisation of cultural heritage involves its protection, which implies its recognition, restoration and conservation. The purpose of this article is to illustrate strongly a strategy for restoration and valorisation. The target is to guarantee the physical conservation and the maintenance of the use, because – without a continuous employment – a physical declining process would rapidly occur causing abandonment[5].

The main objective for this research is the extensive study of a particular case: the south-west section of the medieval city walls of Pisa, including the Sixteenth-century bastion, so-called *Canto di Stampace*.

[3] Picone R., *Il rudere architettonico nella storia del restauro*, in Confronti. L'architettura allo stato di rudere, in Quaderni di Restauro Architettonico, n. 0, Roma, 2009, pp. 27-41.
[4] Brandi C., *Teoria del restauro*, Torino, 1977.
[5] Frate M. C., *Restauro e conservazione del patrimonio storico*, Palermo, 2010, pp. XI-XVI.



Materials and Methods

Undoubtedly, the study of historical building remnants in a state of ruin and their conservation and protection is a complicated and across-the-board topic that requires multidisciplinary contributions. This study aims to analyse the complexity of the Restoration field, and its connections with Composition, Archaeology, Landscape and Technology areas, concerning the re-use of a cultural asset for the benefit of the community.

The re-use, and therefore the "adaptation", of ancient structures in a state of ruin entails the modification of the artefacts, in order to include new functions other than the exquisitely contemplative one. This operation requires an in-depth analysis regarding the connection between the new additions and the historical architecture. Any interventions has to comply with the typological, material, structural characteristics of the *monument-document*[6].

First of all, a study including solid detailed territorial analysis, as well as an accurate historic, bibliographic and archival survey, is crucial. Within this study, the ability to understand, analyse, synthesise the information will aid in the organization of the planning process. An in depth knowledge of the subject carried out on different levels (historical, typological, material) is an essential precondition to analyse the historical-architectural artefacts.

The historical stratification represents an important document. Therefore the project takes into consideration all the historical phases and events that characterized the *Canto di Stampace* and its architectural artefacts.

The construction of the medieval city walls started in the Twelfth Century. It proceeded by stages, beginning from the north-west corner (1154), and it was completed in a few years. The walls are built with two skins of stonework, made of squared-off stones placed in regular courses with little mortar, and a rubble core. They are approximately 2.20 meters thick. The

[6] Le Goff J., *Documento/Monumento* Enciclopedia Einaudi, eds Ruggiero Romano et al., Torino, Einaudi, 1978, 5, 38.

Stampace bastion, two-dimentional ovest front rappresentation. **a)** Wireframe. **b)** Orthophoto mapping.**c)** Material-constructive system analysis. **d)** Degradation phenomena analysis.

crenellated parapet has rectangular shape merlons made of bricks. The walls were surrounded by a pomerium and a moat.

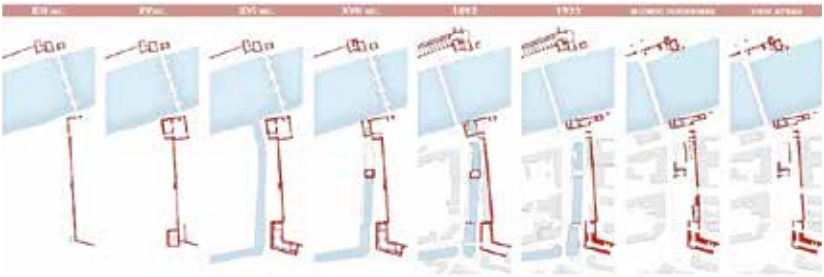
Addictions, modifications, new fortifications were made throughout the following centuries.

In Stampace, a tower was built to reinforce the south-west corner of the walls (ca. 1287). During the Florentine domination, a fortification was built around the Thirteenth-century tower: historical narrative reports its existence in 1426 when it was used as a prison.

The battles that took place between the Fifteenth and Sixteenth Centuries caused serious damages to the *Canto di Stampace* fortifications, therefore substantial works were necessary to reinforce them. In the Sixteenth Century a bastion was built, probably re-using part of the structures of the existing Fifteenth Century fortress. [7]

In the Seventeenth Century, a new system of fortifications was built around the old walls.

[7] Tolaini E., *Pisa: la città e la storia*, ETS, Pisa, 2007.



Historical evolution of the Canto di Stampace

Presumably, the Stampace bastion remained unaltered, or maybe it was reinforced with earth rampants.[8] During the following Century these fortifications lost their military function and were therefore no longer maintained. In consequence they resolved into a health problem for the city and they were demolished in 1767.

During the Nineteenth Century, the medieval city walls were seen as a useless and cumbersome presence. The Stampace bastion underwent large modifications between the end of the Nineteenth and the beginning of the Twentieth Century, both additions and subtractions, in order to allow the passage of the railway line.[9,10]

Lastly, it's important to remember that the area of the bastion was also largely affected by the bombings in 1943 in Pisa.[11]

In order to represent the object of the study in drawings to an appropriate scale, collecting data directly on the field is essential. Architectural survey is a branch of descriptive geometry; it includes the processes and methods that allow to acquire reliable morphological information about a physical object, a building, or, in this specific case, an urbanized area, in order to obtain a two-dimensional or three-dimensional model. [12]

The survey campaigns that supported this study[13,14,15] were based on the integration of

[8] Salotti C., *Il '600. I bastioni e le mezzelune di terra*, in Bevilacqua, M. G., Salotti, C., Le mura di Pisa - Fortificazioni, ammodernamenti e modificazioni dal XII al XIX secolo, Edizioni ETS, 2010, Pisa.
[9] Betti Carboncini A., Bedini M., *Livorno e Pisa: due città e un territorio nella storia dei trasporti pubblici locali*, Calosci Editore, Cortona, 1986.
[10] Vasarelli F., *Il Trammino Passato, presente e futuro della ferrovia del litorale pisano*, Edizioni ETS, Ghezzano (PI), 2012.
[11] Aa. Vv., 31 Agosto 1943, Pacini Editore, Pisa, 2004.
[12] Bini M., Bertocci S., *Manuale di rilievo architettonico e urbano, Novara*, De Agostini Scuola S. p. A., 2012.
[13] Bevilacqua M. G., *La fortificazione delle mura urbane a Pisa nel XVI secolo. Il rilievo delle strutture superstiti*, tesi di dottorato in Scienze e Tecniche delle Costruzioni Civili, Università di Pisa, 2008.
[14] Pierotti M., *L'Oltrarno dimenticato. Progetto di restauro e riqualificazione urbana del canto di Stampace a Pisa*, tesi specialistica in Ingegneria Edile Architettura, DESTEC, Università di Pisa, 2013.
[15] Marchionne L., Parrini E., *Il canto di Stampace. Un caso studio per la riqualificazione e la riconnessione urbana*

Tratigraphic analysis of an internal front of the Stampace bastion. a) Individuation of the stratigraphic units.

b) Harris matrix.

multiple measuring system. Firstly, a laser scanner was used to acquire morphological information. Then photogrammetry, the process of recording, measuring and interpreting photographic images to obtain orthoimages rich in details, was applied. Additionally, manual measurements were carried out for those parts not measurable otherwise, and to check any systematic or methodological error. [16]

The survey provides important information, in order to conduct further analysis and then, finally, to develop a restoration project. This process involves a critical and continuous comparison among all the subject matters such as history, environment, degradation, conservation, material-constructive system. [17]

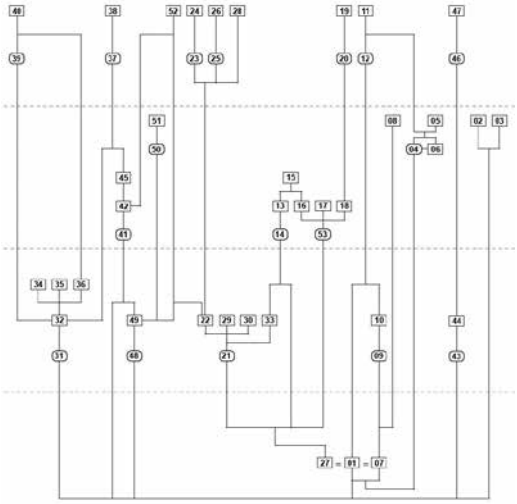
Different analysis were therefore carried out, such as a material-constructive system identification and a degradation phenomena inventory.

Advanced archaeological survey methodologies were used for the recognition of the monuments' history and their architectural evolution over time. As a matter of fact, buildings are the result of constructive and destructive actions from various periods that caused

della città di Pisa attraverso le antiche strutture difensive, tesi di specializzazione, Scuola di Specializzazione in Beni Architettonici e del Paesaggio, Dipartimento di Architettura, Università degli Studi di Firenze, 2020.

[16] Bertocci S., Minutoli G., Mora S., Pancani G., *Complessi religiosi e sistemi difensivi sul cammino di Santiago de Compostela: Rilievi e analisi per la valorizzazione e il restauro della cattedrale di santa Maria la Real a Sasamon.*

[17] De Vita M., *Verso il restauro*, Firenze University Press, 2012, pp. 18-19.



formal and materials modifications. The stratigraphic study of surfaces and structures[18] is one of the main method to identify and analyse the different historical periods and their respective shreds of evidences. Different techniques and materials used in a particular construction are considered signs of its transformations: these "stratigraphic units" are mapped and ordered with a method called "Harris Matrix"[19].

Additionally, dissimilar types of masonry have been identified and classified in forms, in order to confront and analyse different constructive phases.

Lastly, mineralogical and petrographic analysis provided detailed information regarding materials and their chemical composition.

Analysis methods, interrelations among data and results constitute fundamental steps during the elaboration of the restoration project in order to have control during its development, ensuring its feasibility for the effective transmission of the historical artefact to the future. [20]

Results

Expressive newness, in the Restoration field, is defined as that particular way of pursuing the distinction of any addition and, at the same time, that particular way of preserving the

[18] Brogiolo G., Cagnana A., *Archeologia dell'architettura. Metodi e interpretazioni*, Firenze, 2012; Boato A., *L'archeologia in architettura*, ed. Marsilio, Venezia 2008; Pittaluga D., Questioni di Archeologia dell'Architettura e Restauro, ed. ECIG, Genova 2009.

[19] Harris E., *Principles of archaeological stratigraphy*, Academic Press, London,1989.

[20] De Vita M., *Verso il restauro*, Firenze University Press, 2012, p. 38.

Design of the new aerial walkway. a) Section A-A′. **b)** Section B-B′. **c)** Plan.

Project layout.

authenticity of the artefact. New materials and techniques chase the criteria of reversibility and compatibility.[21]

The restoration project of the historical complex in Stampace and its integration into the cultural activities of the city chases the same criteria. The addition of technological features employs a contemporary language. These new additions are meant not to be excessive or invasive and the design uses light materials and solutions to be respectful to the identity of the location.

The restoration proposal aims to integrate the area inside the city life through the creation of new social spaces. The definition of the project is based on strengths and weaknesses of the area to increase the value of the former and rectify the latter.

The project proposes the requalification of the entire area between the Stampace bastion and the ex-tram station. Hence, the architectural artefacts are included in the existing cultural activities, museums and organised visits of the city.

The top of the medieval walls and its accessibility are restored. Interruptions of the path caused by modern demolitions, alongside Largo Martini and at Porta a Mare, are re-integrated with new structures that complete the walkway. The compatibility of these new structures with the historical monuments is guaranteed by the use of light technologies and materials, which consist of non-invasive metal elements, characterized by a particular perforated pattern, appropriately designed to visually and chromatically philologically resemble a traditional repair work with bricks.

[21] Palmerio G., *Il progetto di restauro*, in Carbonara G. (diretto da), Trattato di restauro architettonico, vol. I, Torino, 1996.

The bastion and the ex-tram station constitute two important access points to the new museum path. Both are restored and accessible and reconfigured as new cultural centres. New vertical and horizontal connections are integrated, for an architectural barriers-free design, still respecting the fundamental criteria of Restoration.

The inner galleries of the bastion are renovated as exhibition spaces, the roof structure is repaired and integrated with a panoramic viewpoint. An excavation around the exterior fronts allows to reveal the entire height of the scarp, which was covered with terrain shortly after the World War II bombing. Furthermore, the excavation grants to redesign the area including a *cavea*-shaped space in front of the bastion, with great potentiality and noteworthy polyvalence.

In the ex-tram station building, the existing vertical connections are implemented and separated based on different types of users. The interiors are re-configured as tourist reception, permanent and temporary exhibition spaces, and administration.

The outdoor spaces are redesigned as a new urban park that includes multi-functional areas for several activities. The historical Nineteenth-Twentieth Centuries tram-rails are re-proposed on the pattern of the paving, as an evidence of an important historical phase as well as to enhance the design homogeneity. This railway motif has in addiction different conformations: from the basic double metal line with an internal paving pattern as a remembrance of the historical railroads, to other various designs, such as recesses for pavement lights or extruded elements for urban furniture like portals, vertical panels, benches and planters. Urban furniture elements are integrated into the context, in harmony with the metal structures of the new aerial walkway. They are versatile, removable, modular and combinable, in order to compose different configurations and to enclose different functions, thus ensuring a new attractive and innovative vocation to the area.

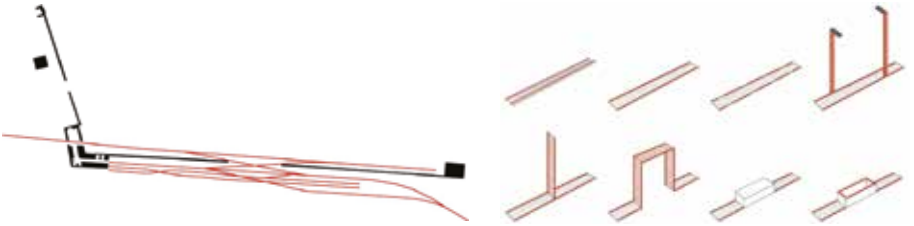
Design of the bastion area. b) and **c)** Rendered views.

The urban design based on the historical railway tracks. a) Layout of the historical railroad. **b)** Design development of the rail as the base element.

The design also includes the choice of specific plant species to improve the environment both from an esthetical and ecological point of view. The new urban park is crossed by a path furnished with planters that accommodate shrubs characterised by separated and suggestive blooming periods, and it is enclosed by a green belt with trees that create a visual and anti-smog filter.

With the purpose of making the citizens more involved and engaged, an area of the new urban park is dedicated to experimental cultivation and pollinators observation, managed in collaboration with the University of Pisa. This spaces are accessible and open to the public, and they could be used as a research laboratory for Agriculture and Biology students, or as multidisciplinary workshops such as guided tours, multimedia communication, etc...

Lastly, the initial part of the historical *Canale dei Navicelli* (Navicelli's canal) is restored and refilled with water, with its reconnection to the river Arno. Boats for trips along the



river could be accommodated here to connect and integrate the Stampace area with other cultural and recreational activities that the city can offer.

Conclusions

In conclusion, the area known as Canto di Stampace shall be converted from a neglected unsafe area to an important landmark destination with a high cultural and social value. With new vitality and dynamism to the neighbourhood, it will immensely improve the environmental qualities, adding new social catalysts.

Different types of attractions are here located: the cultural ones such as the restored monuments with the new museum tour on the top of the medieval walls and inside the bastion; the artistic ones such as the outdoor polyfunctional *cavea* and the modular and combinable urban furniture elements that can accommodate temporary exhibitions; the "green" ones such as the new urban park with innovative and versatile features; and finally the connection and integration of the area with the city networks and other attractions.

All the interventions are not invasive and rather enhance the historical monuments, respecting their identity with the use of light materials and solutions.

This case study has made possible to understand how important succeeding in finding the value and the qualities of historical buildings in a state of ruin can be. In this way, it has also been possible to discuss the difficult topic of sustainability through the re-use of existing constructions and – particularly – of the historically important ones. This project is about a re-use strategy that could be considered the recovery engine from both an urban and an architectonically speaking point of view.

In this case, the challenge becomes being able to find a new function for the monuments in order to make them a real social centre for the community. Hence, thanks to the connection with the cultural tour of the city of Pisa, we succeeded in maintaining the architectural spirit thus reintegrating the area's relation with the modern society.

Finally, the *Canto di Stampace* manages to live an endless present adapting and transforming its morphology and use to the new necessities of the ever-changing urban lifestyle.

a) and **b)**
Rendered views.

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Authors' Contributions

L.M. and E.P. contributed equally to the acquisition, interpretation, analysis of data, to the design and implementation of the project and to the writing of the article.

MODERN AND INDUSTRIAL: THE NEW ABANDONMENT. THE CASE OF THE CANAVESE AREA

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Teletype Printer Factory (ph. R. Maspoli).

The Canavese area of the Piedmont Region is an example of an intermediate inland area in which marginality and a need for rebalancing were already emerging in the 1950s, generating an innovative plan for manufacturing, social, and educational hubs. The crisis of the economic and community model linked to Olivetti – the driving force behind the plan – in the 1980s led to a process of deindustrialization and further decline.
The inclusion of "Ivrea Industrial City of the XX Century" in the list of UNESCO World Heritage Sites (2018) was an important international opportunity to ensure recognition of industrial heritage and landscapes and the most strategic initiative to the practicalities of conservation and compatible regeneration of the entire territory. The future is closely linked to how well these places will be able to reflect the value of the Olivettian industrial past and community, in terms of territorial branding and *imprinting* for sustainable innovation.
This paper aims to outline the industrial heritage developed between the 1950s and the 1970s and the factors behind the technical and economic feasibility of reuse regarding its role in local development, a recognition of architectural and testimonial value, technological/construction/architectural innovation, and current decay conditions. The goal is to overcome the traditionally opposite theme of the study of industrial history and a *recycling of the past*, in which disused industrial buildings cease to be seen as liabilities and become sought-after assets with great potential for redevelopment.

Key-words: Modern industrial heritage, intermediate internal areas, disposal, decay, regeneration

The Olivetti imprinting of the Canavese territory. Cultural and scientific background

From the early 1930s, in the inland Canavese area and the Casotto and Orco valleys the agricultural and craftsmanship sectors were affected by the industrial growth of Olivetti which was mainly concentrated in Ivrea at the beginning, and which left indelible marks on the local economy and landscape.
The cultural and industrial model introduced by Olivetti and the "Community Movement" political party was oriented towards challenging development issues in the area and its surroundings by promoting sustainable development and innovation in order to reduce unemployment and urban drift, and open the area up to cooperative approaches.

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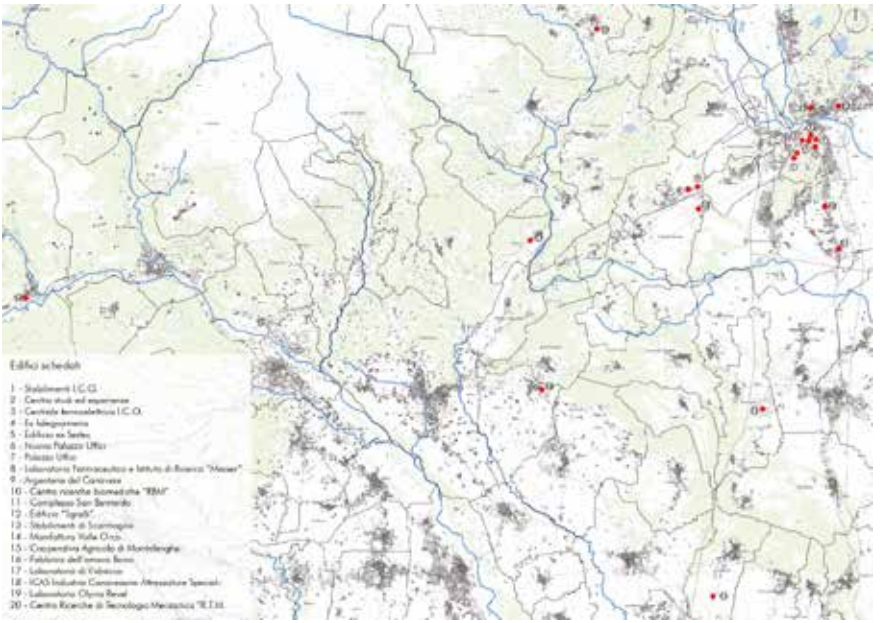


Olivettian territorialism. The places of industry (R. Maspoli, L. Locatelli).

In 1954, the "Institute for Urban and Rural Renewal" I-RUR was founded by Adriano Olivetti. This structure acted as a territorial development agency, launching initiatives and providing technical assistance to private investors, local groups, and town administrations. This experiment is universally considered exemplary and architecture was an essential element of the initiative, revamping locations and promoting new development and stimulating the cultural milieu of rationalism and design.

Ivrea's recent recognition as industrial city model has paved the way for enhancement, industrial tourism and settlement of the digital-ICT and creative industry in the "UNESCO Nominated Properties" sites. These perspectives have not *rebounded* on the inland areas beyond the "Buffer Zone". The landscapes and sites of industry in the city are under specific legislative protection of the Superintendence, while the Canavese countryside heritage has no protection restriction or enjoys degrees of minor control, generally within the municipal planning system.

Place-based conservation involves the understanding of landscape value and territory, and an informed approach is the first condition for ensuring intervention and management planning, beyond the Buffer Zone. *Olivetti territorialism* is a concept that includes the co-evolution of human life, work and places, and the interrelated

transformation of societies and territories. After *territorialisation* and *de-territorialisation*, the prospective of *re-territorialisation* can be actualized through recognizing the identity values of a place, emphasizing the critical phenomena inherent to the contemporary territory. It may be said that de-territorialisation has been characterized by the loss of vital energy - cultural and social, entrepreneurial and economic - and by progressive marginalization and consequential process of decommissioning. Re-territorialisation can take place by re-reading the material and cultural legacy and their meanings and connecting in some way with territorial innovations.

Approach and methodology

The study deals with the census and cataloguing of the industrial and social service heritage from the Olivetti territorialisation of the 50s-70s, by identifying: Type; Construction features; History; Commissioner; Authors; Historical uses; Current condition; Enhancement perspectives; Types of intervention. The pre-analysis highlights conservation - adaptive reuse conditions for sustainable redevelopment and soil saving[1].

The industrial sites "UNESCO Nominated property"

The first part of the study concerns the comparison with the centre of the territorial system, which has already been the subject of several investigations and of the UNESCO "Application Dossier" and "Management Plan" (Control Room, 2017).

The beginning is the Red Brick Factory - I.C.O. along the axis of via Jervis, the external architectural image is preserved, while the interior spaces have minimal traces of the first building, still characterized by functional transformations to the productions of the 60s-70s. The recent ICONA project (2018) places a significantly perspective of heritage led regeneration, bringing together entrepreneurial subjects who have shared the vision of bringing places back to international reference.

The first expansion of the I.C.O. (1934-36), based on an architectural project by Luigi Figini and Gino Pollini, follows the open space model of evolution production. The building is exemplary in its innovative structural, technological and formal choices of industrial architecture; the second and third extensions (1939-49) continue the theme of the structural mesh in reinforced concrete with a double-skin glazed façade and the solar radiation control of the mainly south façade.

[1] The study is the result of research activities on industrial heritage (Politecnico, AIPAI), teaching of the Atelier Redevelopment of the consolidated city B of the Politecnico di Torino (A.Y. 2019-20) and the Master's thesis: Lorenzo Locatelli, *Analysis, evaluation, adaptive recovery and reuse of the Olivetti industrial, tertiary and service heritage. The case study "Pharmaceutical Laboratory and Research Institute Marxer" in Loranzè*, supervisor R. Maspoli, 2020.

Olivetti Mechanical Workshop and Thermal Power, San Bernardo (ph. L. Locatelli, R. Maspoli) - present.

The systematic recovery of the street-facing façades (Giacopelli 2006) constitutes an exemplary case of conservation of the image of the modern, involving analyses, localized replacements, restoration and cleaning. Lastly, the fourth extension (1960-62) is integrated into the elegant closure of the internal courtyard, the "Officine ad H" (1955-60), with the introduction of the metal structure based on a module of 12 m per side of steel pillars, to form a square mesh network.

The factory as functional rationality and standardization corresponds to a new symbolic expression, dominated by the conquest of light: the "glass factory" is the first sign of adherence to contemporary international models of rationalism.

The decentralization of production functions, territorial redistribution and internationalization have led to the progressive loss of production activities since the 1970s, while adaptability of volumes and building system standardization have facilitated its functional reorganization and *mixité*. The ICOs have been the subject of subsequent refurbishment interventions, and the Officina H has become an iconic space for exhibitions and events.

The axis of via Jervis is the context of the other tertiary-production "UNESCO Nominated Property" sites such as the Thermoelectric Power Plant I.C.O. (1956-59) by Vittoria, currently under design and awaiting recovery; the former Olivetti joinery by Ottavio Cascio (1954-55), the rationalist expansion and redesign of the technical building of the 1920s, which became the seat of environmental services; the former SERTEC building by Ezio Sgrelli (1968-72) in exposed concrete, in dissonant connection to a historic villa, currently

Olivetti industrial plant in Scarmagno (ph. P. Mazzo) - present.

being restored; the Olivetti Study and Experience Centre based on an architectural project by Vittoria (1954-55). The building is the subject of the refurbishment project by Ettore Sottsass Jr and Marco Zanini (1999-2000) which contrasted a new, more material vision of the staircase - a functional and compositional pivot of the building - and then of Pegaso's project for the new Olivetti headquarters (2018-19). The transformation is significant in the various phases following Olivetti's period: first as the innovation for training in interaction design, then the role of national hub to support the digitalization of companies. Finally, the large complexes of the Office Building (1960-64) designed by Bernasconi, Fiocchi, Nizzoli and the New Office Building (1986-88) by Gino Valle conclude the Olivetti system of via Jervis, at present in underused conditions but which do not demonstrate any conditions of physical-environmental degradation and are *redefinable* in active conservation policies.

The sites of Olivetti's territorialism and productive differentiation

The second part of the study concerns, however, the Canavese sites of modern architecture and innovation in construction technologies and industrial research, which often represent a perspective of enhancement in terms of re-development input, in relation to the conditions of conservation thereof.

The sites of architectural and testimonial significance in San Bernardo are the Teletype Printer Factory based on an architectural project by Ezio Sgrelli (1961-63) and the O.M.O. - Olivetti Mechanical Workshop by Vittoria (1955-62).

Outside the city, the focus is on the complex of Scarmagno (1967-70) and others minor activities linked to Olivetti commissioning: the Marxer Research Centre and

Pharmaceutical Laboratory (1964) by Alberto Galardi and the Argenterie del Canavese (1962) silverware manufacture by Carlo Viligiardi, in Loranzè; the R.B.M. Biomedical Research Centre (1972) by Eduardo Vittoria, in Colleretto Giacosa.

The Teletype Printer Factory - which was completion of a previous settlement, object of industrial regeneration and conversion for the "Citadel of Music" - is a three-storey building, characterized by a free plan, functional to the production flow. The technological and design quality emerges in the evident structure and vertical towers in exposed concrete, with modular cladding. In relation to the protracted disposal, the plant presents increasingly critical conditions, with alteration of the coatings, deterioration of the windows and accessory bodies. This case study is indicative of some typical criticalities of the materials and experimental technologies of the Modern, used for technical components, coatings and finishes. They are often characterised by a short useful life and loss of aesthetic quality over time, as well as obsolescence as they are difficult to replace being discontinued in industrial production.

The O.M.O. factories, in the same area, continue instead Vittoria's experimentation in metal construction with the "Covre" system, which allows the industrialization with the rapid completion. The composite pillars support the high spatial lattice beams arranged in both directions, supporting the roof with a large structural mesh (16x8 m) and the perimeter walls have glass areas and modular opaque panels. During the industrial decline, conditions of decay emerged, faced with the recovery, which substantially maintained the original plant, but leaving the iconic thermal power plant abandoned and demolishing its chimneys.

The most critical case of industrial decommissioning concerns the Scarmagno complex, on a 1,100,000 m^2 area in the plains, constructed for the first long structure (Building "A") with a 12 m^2 module steel system, based on an architectural design by Ottavio Cascio, and for Buildings "B", "C", and "D" based on a design by Vittoria and Zanuso.

The emergence of the exposed structure and the contiguity with the contemporary technological innovation of reinforced concrete, highlight the role of factories in the great season of Italian engineering. The light closing walls are in panels intended for disassembly in future plant expansions. The skylights made of barrel-shaped and overlapping polyester resin sheets are the result of technological research analogous to that used by Louis Kahn for the Olivetti Harrisburg. The buildings represented both technological innovation and the *final utopia* of the modular and infinite factory permitting maximum organizational variation, until production was discontinued in the 90s.

Tertiary-productive reuse was subject to subsequent divestments and "Building C" fell victim to thefts and vandalism following a fire in 2013. Emergency reparative maintenance interventions, with localized replacement of roofing and interior elements, have often been

Marxer Research Centre and Pharmaceutical Laboratory in Loranzè (ph. L. Locatelli) - present.

inadequate in maintaining modern architecture. The light casing elements show degraded conditions, while the supporting structure generally appears in good condition, but would need to be subjected to tests to see its compliance with safety standards. The industrial-tertiary conversion as well as the hypothesis of partial demolition require significant redevelopment work and adaptation of the hygro-thermal and acoustic performance and the overall reconstruction of the plant systems.

Another significant case of abandonment is the Marxer in Loranzè, built on the direct assignment of Adriano Olivetti as an industrial innovation between production and research, a pioneer for the pharmaceutical industrial development in the area. The complex is characterized by the modernist geometry of the parallelepipeds, emerges for the choice of mainly raw materials - concrete, metal and glass - and for the solar shading systems in *béton brut* of the facades.

The works of Alberto Galardi, Ezio Sgrelli and Marco Zanuso testify to the Milanese school's experimentation on exposed reinforced concrete, in adherence to international constructive and formal models of the modern. At present, all the systems are unusable and most of the internal construction elements are severely damaged or absent. However,

the buildings are significantly resilient thanks to their concrete structures and façades, but the reuse thereof would require analogic reconstruction of the glass casing, partitions and technological systems performance for thermal and acoustic comfort, consolidation and surface restoration works of concrete, while checking also for static safety.

Different conditions of use and conservation concern the nearby R.B.M., which consists of five single-storey buildings arranged around a covered distribution path. The sheet metal cladding of the structural beams forms a cover that juts out from the plastered and strictly white perimeter walls, alternating the intermediate horizontal windows and accentuating the light-dark effect in the natural context. The R.B.M. is a case of very high functional development of the site, which led to an overall transformation for the needs of the production. Some elements of Vittoria's original design are still present, but the *recognition* of the original technological and architectural system is limited.

Highlighting of significance of a modern architecture - already reported and published - can, however, encourage respect and appreciation, also in terms of the real estate market and corporate cultural tourism.

Vidracco Laboratory in Vidracco; Mechanical Technology Research Centre in Vico Canavese (ph. L. Locatelli) - present.

The sites of territorialism for community reconstruction

The third series of sites concerns the interventions promoted by I-RUR and Olivetti to improve the social and economic conditions of the Canavese area, aimed at making the new productive structures "authentic communities of workers", framing the whole activity in a democratic plan of economic development and human settlement (Serafini, 1982).
Over a 15-year time span, the I-RUR and Olivetti commissioned the Social Winery of Piverone and the Agricultural cooperative of Montalenghe by Giorgio Raineri (1958). The company commissioned in the social-industrial diversification field are the Vidracco Laboratory by Eduardo Vittoria (1964), the I.C.A.S. Pharmacy Furniture Factory (1959), the Research Centre of Mechanical Technology R.T.M. in Vico Canavese by Nello Renacco (1963-64), the Valle Orco Plastic Manufacture (1957), the Amaro Bairo liquor factory (1958), and the Baltea Motori mechanical factory (1956). The sites are identified according to the strategic role in the area and as the legacy, as some of these are significant for the architecture and construction system.
Among these, the Vidracco project sees the extension of a balcony over the landscape in contiguity and dissonance with the historic centre. The modular square system in reinforced concrete is divided into two lateral lots connected by a central body, lower and set back. The asset, in a state of decay after its decommissioning in the 80s, was recovered (2004) though its external conservation and partial respecting the modern architecture. The re-functionalization has a confined role of local socio-economic regeneration.

The option of *territorial heritage strategy*

Olivetti's *territorialism* - between localism and internationalization - currently constitutes a resource for *re-territorialism*, because it was the expression of an integrated, innovative and human centred approach, beyond the Fordism model.

The industrial architectural projects are developed, in the 50s-60s, in harmony with the social and cultural texture of the host territories, while in accordance with growing strategies of productive diversification and integrated design.

Cultural activities are at the centre of a process characterized by interdisciplinary research in mechanics and automation, social progress and environmental protection, publishing and communication, architectural rationalism and product design. They found themselves, in the 80s, in the centre of an evolved systemic and organizational process, articulated internationally and integrated in the sectors of "industrial design, identification system, interior design, architectural design, exhibition design, type-face design and graphic design & advertising" (Shapira 1979).

The *progressive peripheralization* of the Canavese, since the 90s, has followed the steps of the retreat of Olivetti and the consequent weaken of community strategies, managerial culture and innovation that represented one of the crucial passages of Italian capitalism. The

relative industrial loss of rank and apparatus of the North-West, in the 10's of 2000, also overlapped. Following the decay, the signs of *a milieu available for innovation* emerge, combining international perspectives in the fields of information technology and digital evolution and recognised excellence in the field of bio-industry and technological systems for automotive.
Nowadays, the UNESCO World Heritage Site designation is a coveted brand of approval, which can open the association of well-established heritage, tourist attractions and social-economic redevelopment.
The Olivettian utopia left, in fact, an entire piece of modern city built in Ivrea and pieces of this city also scattered throughout the territory.

Critical framing and industrial heritage potential

Functional reuse calls into question the *respect and care* of existing heritage, according to bright spaces, sequences of iterated elements, unity of shapes and light colours, rigorous but flexible organization of the continuous activity and socialising areas. The open space set-out is in line with goals of economy and the representation of a new sociality of work, potentially comply with the objectives of reuse.
The industrial heritage, under study, has been subject to continuity of use and not always adaptive reuse in some cases, to philological restoration and enhancement of the legacy in few cases. Several cases show - on the contrary - different levels of decay in partial-total decommissioning or transformation conditions that have compromised their architectural character or are awaiting new use. However, these may constitute *options* for the future of the Canavese area, which is currently being debated by local institutions, entrepreneurs and the community.
The *post-industrial containers* may become locations for creative industries, services for hospitality and reception in cultural tourism and educational sectors, social inclusion and corporate social responsibility poles - continuing Olivetti's industrial humanism - as centres for contemporary art, environmental education and technological innovation such as industrial memory museums. Surveys undertaken by the territorial bodies (Control room for the nominations Ivrea, 2017) indicate other possible re-destinations of the heritage according to redevelopment policies, such as innovation poles of the New Economy, start-up accelerator, enterprises competence centre, incubators in the Human Talent Factory perspective.
The impact of the New Economy, the awareness of territorial identity, the *recognition* of modern heritage and the environmental consciousness are open and contingent issues.

The project needs to confront the re-use and conservation feasibility of modern industrial heritage, in particular the issues related to choice of compatible uses, energy improvement and retrofitting, as well as structural performance adjustment, environmental remediation and strategies of eco-biocompatibility. The adoption of systematized analysis methods and technical support services, relating to the state of the building, have the objectives of study the building structures and envelopes, in order to determine its overall performance and the definition of the energy requirements and starting targeted interventions, able to guarantee new transmittance performance, efficiency and energy requirements.

The *heritage future* needs validated diagnostic procedures, pre-feasibility analysis, guide line and best practices for intervention process and *neo-urbanism* code for sustainable conservation and reuse.

The perspectives regarding the sites of Olivetti *re-territorialism* are currently linked, therefore, to the increase in the attractiveness of the Modern Architecture legacy and quality of places, in relation to option of total space conservation or *under volumetric architecture* or new volumetric integration.

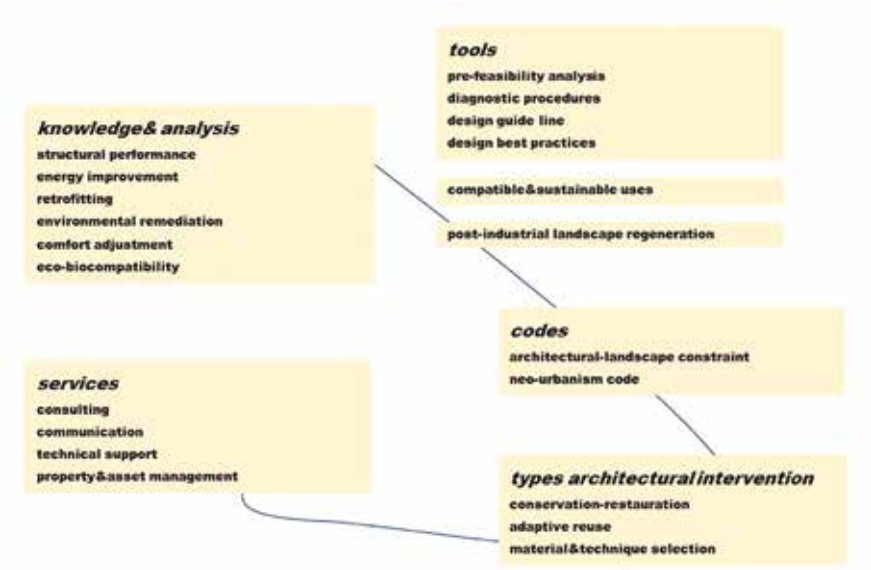
Role of community participation and audience engagement in heritage conservation

The *territorial heritage strategy* to handle challenges requires giving new form to consulting, communication, technical support management services, adaptive leadership and comprehensive community approach in order to activate the terms - potentially in opposition - of compatible redevelopment and conservation-restauration.

The UNESCO Operational Guidelines (2019) further contend that the heritage's "boundaries often cannot incorporate all the attributes" and the assets that can convey the Outstanding Universal Value and essential factor is "ensure ... participation of a wide variety of stakeholders and rights-holders, including ... local communities, ... non-governmental organizations".

In this perspective, it is even more important to "adopt general policies to give the heritage a function in the life of the community". The choices of conservation and enhancement of the heritage require to stimulate new forms of analysis and sharing of the patrimonial community of Ivrea and its context.

The first perspective is of a new survey, extending from the "Nominated Properties" to the "buffer zone" and the Olivetti territory, to verify the engagement and the current and potential ways of living and experiencing the legacy. It is essential to build up a new narrative for the modern heritage, accessible by the various co-present and in changing communities and



Territorial heritage strategy. Potential configuration diagram.

city users, from heritage tourists to residents, from new generations to immigrants. The participatory model concerns, to *re-built* the collective memory and the values to entice local communities into engaging and collaborating. The communication and social networking are keys to active processes of recognition and to consent forms of implicit / explicit participation, from simple listeners to proactive *prosumers*. Industrial elements and outdoor spaces - public and private - in state of disuse or decay may be suitable for care interventions by collaboration agreements between citizens, local stakeholders and the City.

A central role has a shift from *government* towards *governance* - implying an active involvement of relevant stakeholders - and towards *participatory governance* - involving private actors, civil society organisations and interested citizens - in the whole process of decision making, planning, implementation, monitoring and evaluation of cultural heritage policies.

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NEW PROXIMITY TOURISM OPPORTUNITIES. HYDROELECTRIC HERITAGE: A NEW ALLIANCE BETWEEN OWNERS AND TOURIST/CITIZENS

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1925-1929, Cadarese hydroelectric power plant in Cadarese, Premia (Verbano-Cusio-Ossola). Project by Piero Portaluppi. Foto by Studio Publica, 2017.

Cultural tourism is a valuable mean through which actively promote the reactivation and development of those sites that today are in a marginal condition and affected by abandonment.
Traditionally regarded as a cost to society, cultural heritage is now widely appreciated as an essential part of Europe's underlying socioeconomic, cultural and natural capital. In fact, cultural tourism can provide socio-economic advantages, supporting long-term employment, empowerment and other opportunities for local citizens through joint initiatives.
The recent pandemic due to the CoVID19 virus and the necessary restrictions on people's mobility have led to the collapse of the outgoing tourism and to a growing interest in the closer cultural heritage. The growing desire for "nature" and security pushes people to re-evaluate local cultural resources promoting the rediscovery of peripheral locations normally isolated from the tourist routes.
As for the mountain areas, many sites, that in the past were inhabited by numerous local communities taking care of those territories and visited by many winter tourists, are now affected by demographic recession and progressive oblivion. Because of the great presence of water, since the end of the XIX century these areas have host a relevant hydroelectric heritage – dams, power plants, etc. – spread in all European mountain. Today, as if they were not perceived, the elements of the hydroelectric network, representing an important part of the history of these places, are not enough considered for their cultural and historical values. Still active for the same productive purposes for which they were built, they could implement the didactic-cultural offer of the mountain sites and the range of their economic resources, through the development of an innovative, cultural and sustainable tourism[1].

Key words: Proximity tourism, CoVID19, outdoor, hydroelectric heritage

From value to impact: Cultural Tourism as driver of economic and territorial development

The past few decades have witnessed major conceptual and policy developments at both European and international levels which have recognised the multiple and valuable benefits that cultural heritage brings to society as a whole. The concept of value has always been the rationale underlying heritage maintenance and conservation. Therefore, efforts to conserve something are only be made when some value is attributed to it. If on the one hand,

[1] The article is the result of the joint work of the two authors. In particular, Elena Vigliocco is the author of paragraph 1, Manuela Mattone is the author of paragraph 2. The conclusions have been drafted jointly.

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1920-1923, Valdo hydroelectric power plant in Valdo, Formazza (Verbano-Cusio-Ossola). Project by Piero Portaluppi. Foto by Studio Publica, 2017.

the current interest in heritage values is caused by the democratisation of heritage and its growing importance in today's society[2], on the other, the permanent scarcity of funds for heritage management and conservation is now becoming increasingly urgent. Indeed, the costs of heritage are an obvious burden for governmental budgets, whereas the benefits of its maintaining are often intangible and difficult to capture in conventional terms[3]. This has led to a remarkable shift in heritage discourse in contemporary policies. It altered from a conservation-oriented (or object-oriented) approach to a value-oriented (or subject-oriented) one. More often, the value of heritage has been emphasised by arguing that it has a significant social and economic impact on society[4]. This approach tends to use cultural ventures and cultural investments as a means or instrument to attain goals in other than cultural areas such as wealth and job creation or, more currently, social cohesion and community development[5]. A closer integration of economic and social values

[2] De la Torre, M. & Mason, R., 2002. *Introduction*. In: de la Torre, M., ed. *Assessing the values of cultural heritage. Research report*. [Online] Los Angeles: The Getty Conservation Institute, pp. 1-5. Available at: http://hdl.handle.net/10020/gci_pubs/values_cultural_heritage [Accessed: 4 September 2020].
[3] McLoughlin, J., Sodagar, B. & Kaminski, J., 2006. *Dynamic socio-economic impact: a holistic analytical framework for cultural heritage sites*. In: McLoughlin, J., Sodagar, B. & Kaminski, J., eds. *Heritage impact 2005*. Proceedings of the first international symposium on the socio-economic impact of cultural heritage. Budapest: EPOCH, pp. 43-57.
[4] See CHCfE Consortium, 2015. *Cultural Heritage Counts for Europe. Full report*. Available at: www.encatc.org/culturalheritagecountsforeurope [Accessed: 4 September 2020].
[5] Vestheim, G., 1994. *Instrumental cultural policy in Scandinavian countries*. International Journal of Cultural Policy, 1(1), pp. 57-71.

of heritage for sustainable growth and social cohesion is the contemporary goal. Heritage becomes a source of democracy and well-being and cultural tourism can be its driver.

Tourism represents an important element in the social and economic life of the European Community. This sector responds to the legitimate aspirations of individual citizens to travel, to approach different cultures and to rest or carry out recreational activities out of habitual contexts (such as home or work). For many cities and regions of the European Community tourism is a very important economic resource and offers a particularly valuable contribution to social and economic development and cohesion.

According to the Report on Tourism and Culture Synergies, written by the United Nation World Tourism Organization (UNWTO) in 2018, Cultural Tourism represents 39% of global tourism and is aimed at an increasingly broad and inclusive set of cultural heritage. It can be an important tool both for the safeguard of the cultural heritage, promoting its responsible and sustainable use, and for the regeneration of the sites.

Developed in the 1980s as a niche market, cultural tourism is a remove, "type of tourism activity in which the visitor's essential motivation is to learn, discover, experience and consume the tangible and intangible cultural attractions/products in a tourism destination. These attractions/products relate to a set of distinctive material, intellectual, spiritual and emotional

1923-1924, Crevola hydroelectric power plant in Crevoladossola, Formazza (Verbano-Cusio-Ossola). Project by Piero Portaluppi. Foto by Studio Publica, 2017.

features of a society that encompasses arts and architecture, historical and cultural heritage, culinary heritage, literature, music, creative industries and the living cultures with their lifestyles, value systems, beliefs and traditions"[6]. It finds motivation in the growing interest of visitors to know, discover, experiment and enjoy the material and immaterial cultural heritage of the site visited.

As is stated by UNWTO in September 2019, Tourism has seen continued expansion over time, and the travel & tourism (T&T) industry plays a vital role in the global economy and community. In 2018, the industry helped generate 10.4% of world GDP and a similar share of employment, and has shown enormous resilience over the last decade. As far as Europe is concerned, in 2019, the T&T industry employment has reached the value of 14.939.000, with a total impact of 3,9% of the employment. Tourism and in particular cultural tourism can actively contribute to the acquisition of essential economic incomes necessary to guarantee both the preservation of the assets and to the reduction of phenomena such as depopulation and abandonment, with positive effects both locally and regionally. Free from seasonality and practiced by visitors who are interested in getting in touch with local communities and inclined to spend a greater amount of money in the recreational/educational

[6] See UNWTO, *Tourism and Culture*, https://www.unwto.org/tourism-and-culture [Accessed 8 August 2020].

1920-1923, Valdo hydroelectric power plant in Valdo, Formazza (Verbano-Cusio-Ossola). Project by Piero Portaluppi. Foto by Studio Publica, 2017.

activities proposed if compared to other types of tourists, cultural tourism constitutes a valid incentive for the creation of new job opportunities. In fact, the increase of the demand in terms of goods and services in the locations visited determines the start of new business activities in the recreational, hospitality, transport sectors, implementing and diversifying job offers and reducing the unemployment rate. Through responsible and sustainable "exploitation" of cultural resources, cultural tourism is able to give rise to positive externalities useful both for local regeneration and development, and for the preservation of that heritage with respect to which it has specific interest.

Nevertheless, the positive experience of cultural heritage and cultural tourism are not yet universal. In many places, both urban and rural, rich cultural assets have not been recognised for the potential they hold to regenerate and renew. The level of development of cultural tourism among certain regions and sites is still unbalanced, with deprived remote, peripheral or deindustrialised areas lagging behind whereas high demand areas being overexploited in an unsustainable manner. Therefore, it is necessary to define new strategies and solutions to release the locked-up potential of that cultural heritage so as to unleash the possibilities for its growth and development.

Over the last few years, there have been numerous initiatives aimed at developing proposals which, by combining the various resources (cultural, landscape, naturalistic) located in the territories, offer the possibility of enlarging the number of users potentially interested in enjoying them. This can actively contribute to the revitalization of these

sites, reactivating those territories that today are in a condition of marginality. As stated by Sandro Danesi, «lesser-known territories have the same development potential as top-quality small and medium [...] enterprises, despite being little-known»[7].

In particular, «lesser-known destinations should seek to incorporate [...] elements of excellence that cannot be compared with the content of knowledge and emotion that well-known destinations are able to transmit» so as to offer different experiences and fully exploit their still un-locked potential.

The recent pandemic due to the CoVID19 virus and the necessary restrictions on people's mobility have led to the collapse of the outgoing tourism sector and, at the same time, to a growing interest in the closer cultural heritage, accessible by its own means. Based on the latest preventative measures being taken by countries, [...] the UNWTO has estimated a decrease of between 20% to 30% in international tourist arrivals (Romagosa 2020). Furthermore, the growing desire for "nature" and security pushes the citizen/tourist to re-evaluate local cultural resources, often not enough appreciated. This crisis represents an unexpected opportunity for the development of a proximity and more sustainable tourism able to

[7] Danesi S., 2017. *The role of Cultural Heritage in Commercial Development and Tourism*. Syphonya. Emerging issues in Management, 3, pp. 48-58, http://symphonya.unicusano.it/article/download/2017.3.05danesi/11506 [Accessed 8 August 2020].

1912-1917, Verampio hydroelectric power plant in Verampio, Crodo (Verbano-Cusio-Ossola). Project by Piero Portaluppi. Foto by Studio Publica, 2017.

overcome the drawback of the pre-crisis travel and tourism industry. Peripheral locations normally isolated from the tourist routes have now the possibility to intercept these new tourist flows discovering/rediscovering and enhancing their cultural and natural assets. Those sites, affected by under tourism and progressive abandonment (such as mountain territories), should take advantage of this situation and foster their social and economic development offering new tourism solutions based on the local natural and cultural heritage and not contributing to overcrowding.

Hydroelectric heritage and new proximity tourism opportunities

The mountain landscape is strongly characterized by the close dialogue between the natural environment and the inhabited areas connected to that specific territory. Many mountain areas, that in the past were inhabited by numerous local communities taking care of those territories and visited by many winter tourists, are now affected by demographic recession and progressive oblivion. No longer inhabited and "lived", many sites have been gradually affected by an incipient ruderisation which, over time, has led to the irreparable loss of a tangible and intangible cultural heritage, «fundamental expression of the culture of a community, of its relationship with its territory and, at the same time, the expression of the world's cultural diversity»[8].

[8] ICOMOS, *Charter on the Built Vernacular Heritage*, 1999 https://www.icomos.org/images/DOCUMENTS/Charters/vernacular_e.pdf. [Accessed 8 August 2020].

To contain these phenomena, it is necessary to identify assets and elaborate cultural proposals offering new possibilities to activate the interest of a wider public, whose presence would favour the acquisition of the resources necessary for the conservation, maintenance and reactivation of this sites. These resources include the assets connected to the hydroelectric heritage. In the last century, a large number of valleys have been protagonist of a long process of hydroelectric development. Since the end of the XIX century, because of the great presence of water, these areas have hosted a relevant hydroelectric heritage such as dams, power plants, infrastructures and traces of architectural artefacts which testify the history of these areas. Despite the presence of these important assets which modelled and modified the natural landscape, these territories have up to now been valued mainly for their surviving natural and rural features.

Hydroelectric heritage is still only partially investigated and exploited because so far used and located in isolated areas such as natural parks (e.g. Parco del Gran Paradiso and Parco Adda Nord in Italy, Parque de Somiedo in Spain, Parc National des Pyrénées and Réserve naturelle du Néouvielle in France). Therefore, it represents a new tourism opportunity and actions aimed at encouraging its knowledge and valorisation are needed. The artefacts connected to the production of hydroelectric energy represent a real cultural resource that, if integrated with other resources present in those sites, could gain greater visibility and readability contributing to make these areas attractive thanks not only to their landscape resources, but also to the historical and cultural ones. Further researches and innovation are needed to foster sustainable initiatives able to regenerate these territories nowadays at risk because of the progressive abandonment they have been affected since the last decades.

Actually, the elements of the hydroelectric network are significant assets, but, as if they were not perceived, they are still not enough considered for their cultural and historical values. In most cases they are excellent engineering and architecture works that, except for rare cases, up to now have not been adequately studied, nor highlighted. Dams and power stations, often authorial works, represent real "architectural emergencies". Built for production purposes, they have also been conceived with the aim of promoting and giving luster and greater visibility to the companies producing electricity that these works commissioned. Designers tried to reconcile the logic of exploitation with symbolic motivations and self-representation, identifying a compromise between "artifice" and nature. In Italy, for example, architects such as Gaetano Moretti, Piero Portaluppi, Giancarlo Maroni, Giovanni Muzio, Eugenio Mollino and Giò Ponti were entrusted with the task of designing hydroelectric power stations that, characterised by a particular aesthetic line and a search for quality, would become lasting monuments, a real source of pride for the entire Nation. Let's consider, for example, the

central Benigno Crespi in Trezzo d'Adda, designed by Gaetano Moretti, rather than the system of power stations built by Piero Portaluppi in the Val d'Ossola - similar to "gems embedded" in the mountains - or even the power plant Ponale, designed by Giancarlo Maroni, laying along Garda Lake bank merging with the surrounding landscape. The works and infrastructures built to produce hydroelectric energy, which in the past, at the time of their construction, had contributed to an increase in tourist flows in mountain areas, thanks to the interventions carried out to ensure accessibility to the valleys, could now offer new opportunities of leisure and cultural growth for the users interested in deepening the theme of the production of hydroelectric energy as well as enjoying the naturalistic and environmental resources. The peculiarity of this heritage is that it is nowadays active for the same productive purposes for which it was built. Nevertheless, it could also become a mean through which implement the didactic-cultural offer of these sites and therefore the range of the economic resources of the investigated territories, promoting its exploitation through the development of a proximity, sustainable and cultural tourism in those territories.

Over the last few years there has been a growing interest, both in Italy and abroad, in the issue of electrification. The dissemination of knowledge promoted by some electric companies (Hydrodolomiti, EDF, interested in fostering knowledge and awareness about their hydroelectric energy production through guided tours) and cultural associations (e.g. the Spanish Fundación ENDESA or the French Fondacion Facim interested in enhancing the historical and cultural value of this CH) bears witness to the cultural value of this heritage. Cultural value that could be exploited to revitalise territories and support Urban and Regional development. During the last decades, an increasing integration of topics related to energy production and tourism has taken place. This new and growing interest towards the different electric energy production systems has determined the development of the so-called "Energy Tourism" (eg. Ené.termica in Ponferrada, ES; Galerie Hydraulica Le Planay, FR; Promenades savoyardes de découvertes, FR; Museu da Electricidade in Lisbona, PT).

Investigating hydroelectric landscapes, offers the opportunity to both outline the components of the hydroelectric network and identify the traces of the territory's past configurations and its different resources. Reading this landscape unveils a series of themes and cues to be addressed by means of design, which should aim at integrating the historical hydroelectric infrastructure as a layer of meaning in the contemporary landscape and, therefore, as a cultural resource for Cultural Tourism. The traces of the path that led to the creation of these works are still present on the territory, sometimes hidden, often in a

state of ruin, and incorporated into nature that has gradually take its own spaces back. These traces constitute, to all intents and purposes, historical-cultural testimonies that, properly explained and connected, could become a resource able to attract an Energy and Cultural Tourism not necessarily expert, interested in deepening the different issues related to the production of electricity and to know the history of a country, of what has made its progress possible and of the geographical areas whose water resources are exploited for energy purposes. These same resources could/should be linked to others (such as naturalistic, architectural, cultural or food-and-wine resources) present in the same territories, helping to enlarge the number of users potentially interested in enjoying them. This could lead to the production of positive externalities, able to actively contribute to the revitalization of these sites.

Therefore, the hydroelectric heritage, which nowadays tends to raise more interest in the field of local history and, partially, of industrial archaeology, without significantly enticing the tourism sector as a potential alternative offer, can be a unique and powerful engine of regeneration, sustainable development and economic growth for urban and rural areas. Hydroelectric sites manifest an exceptional combination of industrial assets and themes associated to the natural landscape. Thus, it is necessary to propose concrete ways through which overcome this lack of knowledge and appraisal and make the community aware of both the cultural value of the historical hydroelectric assets and of the activities that could be carried out to facilitate the valorisation process of this heritage and of its territories, fostering Cultural Tourism development in sites which are affected both by depopulation and by a gradual tourist flows reduction. Owners and managers have now the possibility to intercept this new opportunity for the revival/rediscovery of peripheral locations normally isolated from the tourist routes, implementing proximity and sustainable tourism facing the modified tourist demand.

Conclusion

The development of cultural proposals involving resources variously localized in the territories of the European Community represents a useful tool through which promote the crossing of national borders and encourage intercultural dialogue and mutual understanding of the identities of each member state. In 1987 the Council of Europe launched the program aimed at developing cultural itineraries that offer visitors educational and recreational activities in relation to different themes[9].

[9] They are defined by the Resolution on the Cultural Routes of the Council of Europe (CM / Res 2010, 53) "as a project of cultural, educational, patrimonial and tourist cooperation which has as its objective the development and promotion of an itinerary or series. of itineraries based on a historical journey, a concept, a person or a cultural phenomenon with a transnational dimension, which holds an importance in understanding and respecting common

The importance of the Cultural Routes as instruments useful for the promotion of intercultural dialogue and sustainable development has been recently underlined by the Kyoto Declaration on Tourism and Culture: Investing in future generations (December 2019)[10]. Once again, the vital role played by the Cultural Routes in the framework of strengthening capacities geared towards the sustainable development of cultural tourism and better understanding of shared values has been stated. Therefore, hydroelectric cultural itineraries and, more generally, hydroelectric cultural tourism can be a new common layout to promote the crossing of national borders and to encourage the mutual collaboration of the Member States, encouraging the establishment of relationships between people and sites which, although different, are united by their history, their cultural heritage and water traces. They can play an important role both in the straightening of the common European identity (Europeanisation) and in the socio-economic development of the territories they cross. Understanding this heritage, telling its history, facilitating its enjoyment can actively engage people, thereby helping to secure integration, inclusiveness, social cohesion and sound investment, all necessary ingredients of smart, sustainable and inclusive growth.

European values".

[10] Art. 4.4 affirms the key relevance of "investing in human capacities and the sustainable development of less visited areas, by providing training on cultural and thematic routes and contributing to intercultural dialogue, international cooperation and peace".

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REVITALIZATION STRATEGIES BETWEEN CULTURE AND SOCIAL MARGINALISATION. THE CASE OF THE HISTORIC CENTRE OF COSENZA

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View of a street within the historical centre (photo by N. Sulfaro, 2019).

The historic centre of Cosenza, in Calabria, has undergone a process of almost incessant depopulation since the Second World War. According to several scholars, that process has been fostered above all by the choices of municipal administrations which, through liberal urban policies and deregulation, have oriented urban development towards areas outside the historic centre. This generated a rift between the city and its centre, which over the years has been emptied of its functions - political, economic, cultural, and symbolic - and has undergone a process of abandonment and social marginalization.
The present proposal intends to analyse the processes and initiatives described, trying to demonstrate how the revitalization strategies of a historic centre cannot be entrusted only to cultural policies intended to enhance the use of architectural heritage or cultural animation, but must go through a bottom-up approach through actions of social awareness, education and enhancement of resilience of the communities also towards possible economic and social shocks, as the recent Covid-19 pandemic has shown.

Keywords: Historical Centre, Cosenza, Revitalization, Social marginalisation, Culture

Introduction

Culture as a means of economic and social cohesion is one of the themes proposed by the EU cohesion policy for 2021-2027[1]. That is a particularly challenging issue for Italy, where culture and cultural heritage constitute the main national asset and where policies based on culture could simultaneously trigger economic development and be a factor of cohesion and inclusion and, therefore, of social sustainability. Culture-based strategies in marginal areas, which are increasingly being consolidated in the theory and practice of planning development policies in Italy, have shown enormous potential. They have also underlined some critical factors and open challenges, mainly related to the ability to increase levels of access, actual use of heritage and the degree of community cultural participation.
Despite a vast, extensive, heritage endowment - over 200,000 listed architectural, archaeological, and museum assets, 68 assets per 100 square km -, with a remarkable result in terms of cultural significance and socio-economic values (54 sites and 6 oral cultural heritages and

[1] EU 2020 – European Commision, SIMPLIFICATION HANDBOOK 80 Simplification measures in cohesion policy 2021-2027, Directorate-General for Regional and Urban Policy, Bruxelles 2020, accessible at https://ec.europa.eu/regional_policy/en/2021_2027 (last access 14/09/2020).

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Fig. 1
View of Cosenza from the top of the old town (photo by N. Sulfaro, 2019).

intangibles recognized by UNESCO), cultural enjoyment in Italy remains underpowered. This is particularly the case regarding the widespread heritage, above all in the South, where large sections of the population remain excluded from the circuits of cultural fruition and where even internal tourist demand is struggling to establish itself. Levels of participation in cultural activities by Italians are modest, especially compared to European numbers: in 2016 only 28.3% of adults aged 25 and over expressed a strong cultural participation, while 38.8% of adults were totally inactive[2].

The present proposal, through a case study – the historic centre of Cosenza - intends to analyse the processes and initiatives described, trying to demonstrate how revitalization strategies of a historic centre cannot be entrusted only to cultural policies intended to enhance the use of architectural heritage or cultural animation, but must go through a bottom-up approach through actions aimed at enhancing social cohesion.

Weak policies for resilient communities

In recent years, increasing attention amongst politicians and the public has been addressed to peripheral or marginal areas[3]. Globalization and the ongoing phenomenon of depopulation are under the spotlight of international policies that focus on the negative effects of the two issues. At the same time, more recent interest has also been emerged for the positive reactions of marginal areas to current challenges, thanks to good governance,

[2] Direzione Rivista Siti Unesco, *La cultura come strumento di coesione sociale ed economica*, in *Siti. Quotidiano di attualità e politica culturale*, 22 giugno 2019, accessible at https://www.rivistasiti.it/la-cultura-come-strumento-di-coesione-sociale-ed-economica (last access 14/09/2020).

[3] The term marginal (or peripheral) is here referred not only to physical marginality but also to the social one. Furthermore, the idea of marginal areas mainly refers to small towns or villages, both in rural or mountain areas, which, according to the National Strategy for Inner Areas, cannot easily benefit from health, education, and accessibility. As in the case of Cosenza, the term also includes historical city centres that had become marginal over time in relation to the new city around.

the participation of the community in everyday life, growing attention to social and environmental aspects, well-being, and the changing world of work[4].

In Italy, the supposed supremacy of big towns, intended as models for innovation, creativity, and attractiveness, which has been narrated in the last few decades, has not obtained the expected results in economic growth. On the contrary, social inequality and the discrepancy between North and South and between metropolitan and marginal areas have increased[5].

Nevertheless, the current impact of the Covid 19 pandemic seems to suggest that rather than being considered a problem, one can look at peripheral areas as resources. This common belief had already been brought into the discussion before the pandemic, and in the last twenty years the conviction that small towns are the best habitat for human life has arisen from many quarters (scholars, local communities, experts in ecology, anthropologists, sociologists, psychologists, and so on). Politics had been blind to this perspective until 2014, when a National Strategies for Inner Areas (SNAI) was laid out from a collaboration between the National Agency for territorial cohesion and the European Commission.

Compared to the weakness of metropolitan areas, during the pandemic the peripheral and depopulated small towns revealed remarkable levels of resilience and self-organization capacities to face the difficulties of quarantine. However, not all researchers - architects, urban planners, sociologists, and economists - agree on a possible "revenge" of the inner areas against the failure of the "Big Towns model". Even if dramatic, the emergency has been too short to change rooted politics and behaviours, and it is now clear that strategies and policies adopted until now have been revealed as inefficacious. It is a fact that small towns in inner areas still present the same problems that have caused continuous and persistent migration towards big towns since the last century[6].

Nevertheless, what happened in Italy during the lockdown seems to reinforce new interest for marginal areas and the idea of gathering and transforming the many examples of good practices activated by the resilient communities into something more similar to urban policies. This issue is strictly connected to another one, that is the necessity to overcome the dependency on urban areas, and urban-centric cultural policy[7]. Communities in non-urban

[4] Cotte A., Fund F. (eds), *Culture Crops. Cultural Practices in Non Urban Territories*, Beyond the Obvious 2019 edition, Report of the Conference, Culture Action Europe, Brussels (2019), accessible at https://cultureactioneurope.org/files/2019/12/BtO_2019_Report.pdf (last access 05/09/2020).

[5] Cersosimo D., Donzelli C., *Manifesto per riabitare l'Italia*, Donzelli, Roma 2020.

[6] Oteri, A.M., *Aree interne e città. Né vincitori, né vinti nella lotta contro il Covid 19*, 22 aprile 2020, in I territori fragili e l'epidemia, https://www.eccellenza.dastu.polimi.it/2020/04/22/aree-interne-e-citta-ne-vincitori-ne-vinti-nella-lotta-contro-il-covid-19/ (last access 5/09/2020)

[7] Voices of Culture, *The Role of Culture in Non-Urban Areas of the European Union*, Brainstorming meeting (Alfeld, 4th-5th February 2019), Final report, April 2019, p. 14, accessible at https://voicesofculture.eu/wp-content/uploads/2020/04/VoC-Brainstorming-Report-Role-of-Culture-in-Non-Urban-Areas-of-the-EU.pdf (last access 28/08/2020).

areas rarely reflect that, in many cases, wellness, but also the wealth of cities may depend on non-urban areas. For example, if mountains collapse or glaciers shrink, the effects inevitably impinge on city centres. We can also reasonably affirm that this mutual interdependence is physical and socio-cultural; if the totality of knowledge and tradition of peripheral and rural areas collapses, it inevitably involves the related city centre.
A.M.O.

The role of culture in hindering social marginalisation

From many parts, the idea of enhancing the potentiality rather than the weaknesses of marginal areas has been emerging. The starting point is to consider marginal areas as places of opportunities rather than unlucky, troubling sites. For example, this was the attitude of the participants to the 2019 structural dialogues Voices of Culture, between the European Commission and the cultural sector. The dialogue was dedicated to *The Role of Culture in Non-Urban Areas of the European Union*. The participants agreed that culture and creativity are part of life in such locations. Many other national and international policies, and initiatives promoted all over in Europe to re-launch marginal areas, insist on the prevalent role of culture, in which we obviously include cultural heritage. Focusing on Italy, the above mentioned SNAI includes preserving and enhancing cultural heritage among the main actions for the economic growth of inner areas at risk of depopulation. Of course, placing culture at the base of the re-launch of marginal areas involves some risks. For example, retrieving memory and traditions is very often interpreted as the mass consumption of this same heritage. It is mostly characterized by small rural and inner historical centres in which landscape and architecture are fused together in very suggestive contexts. Financially, it contributes to local economies primarily for its value of use in touristic accommodation capacity.
The other risk deals with the lack of identity in these areas. Stereotypes and false storytelling (the original Tuscan medieval village, the authentic Irish pub) are often the *leitmotiv* of the initiatives for re-launching marginal small towns. They are based on the idea that authenticity and tradition, usually sold to visitors, are static concepts strictly related to the past. The result of such an approach is doubly artificial: for visitors, who consume unreal sites, and for local communities who live like strangers in their habitat (when they are not expelled from the area due to gentrification processes) without any economic benefits.
In recent time, new approaches have been studied by researchers who start from different viewpoints: an evolving and challenging idea of identity; the involvement of local communities in strategies for the re-launch of these areas; the inclusion of cultural strategies

in the wider economic and social policies for that specific territory; the idea of heritage, both material and immaterial, as a common, shared resource, both by inhabitants and tourists.
Some interesting experiences in Italy, based on the above-mentioned points, have been at the core of creating a network of sparse communities using culture. In Valtrompia, for example, one of the main valleys in the province of Brescia, the Attivareee Valli Resilienti (Activate Resilient Valleys) initiatives, launched by the local Mountain Community, have involved the small local communities of the Trompia and Sabbia valleys in a process of rediscovering their identity. Among the main purposes of the projects we can quote the involvement of the sparse population in a process of rediscovering their identity, particularly through involvement of the inhabitants in the processes of maintenance and restoration of historical rural architecture[8]. The idea is to bring these communities at risk of extinction closer to their important heritage of art and architecture. In this way, cultural heritage is seen as a cultural, but also as an economic resource; a common good to invest in rather than to abandon. The project starts from the idea that local communities care for their culture and traditions but they are often unable to imagine or propose the best strategies to hinder depopulation and activate new economies. Skill development for locals could be a good opportunity to involve them in protecting and developing their cultural heritage.
In this perspective, the Cariplo Foundation in collaboration with the Polytechnic of Milan created the Valtellina cultural district (a mountainous area of Lombardy strongly characterized by terraced vineyards realized by terracing the rocky mountain slopes using drystone walls). The landscape and the economy of the region depend heavily on the preservation of these traditional construction techniques. Thus, the investment of Fondazione Cariplo was addressed to the empowerment of the local system and improvement of local skills in the care and maintenance of drystone walls. The effects are circular; local communities are personally involved in the preservation, care, and maintenance of the most valuable characteristics of their territory, appreciating them and, at the same time, the preservation of this fascinating system of terraces and of culture improves the economy connected to wine production, and cultural tourism.
A.M.O.

The historic centre of Cosenza: cultural heritage and marginalisation

The examples described in the previous paragraph all have the involvement of local communities in the strategies and processes of revitalization in common, trying to integrate the

[8] See; Scala B., Boniotti C., *Il patrimonio architettonico montano rurale della Valle Trompia. Linee guida alla conservazione e alla conservazione*, Nardini, Firenze 2020.

protection of heritage, culture, and social cohesion. In this perspective, events in the historic centre of Cosenza, in Calabria, show how culture-based strategies without the involvement of disadvantaged communities can be unsuccessful in relaunching historic centres, especially in marginal areas of the south of the country.

The historic centre of Cosenza, or "Cosenza Vecchia" (Old Cosenza), is located on the eastern side of a hill called "Colle Pancrazio" and is bordered to the east and west by two rivers, Busento and Crati[9] (Fig. 1). It has undergone a process of almost incessant depopulation since the Second World War. According to several scholars, that process has been mainly fostered by the choices of municipal administrations, which, through liberal urban policies and deregulation, have oriented urban development towards areas outside the historic centre. This generated a rift between the city and its old town which has been emptied of its functions - political, economic, cultural, symbolic - and has undergone a process of abandonment and social marginalization.

The old town remained within these territorial boundaries for many centuries: until the Nineteenth century, it had expanded with only three small villages - Porta Piana, upstream of the historic core, Rivolcati, along the left bank of the Busento, and Pignatari, at the foot of Colle Triglio - increasing the population density with buildings developed in height, mainly due to the flooding of the two rivers, and malaria[10].

At the beginning of the twentieth century, demographic growth due to the urbanization of the population coming from the surrounding small towns and earthquakes - in particular, in 1905 - constituted a strong push in favour of the expansion of the city beyond the two rivers. Specifically, expansion continued during the fascist regime, when major public housing initiatives were implemented.

From the second post-war period onwards, the absence of urban planning tools that could guide urban transformations generated uncontrolled urban development. Since the immediate post-war period, the core idea of the administrations has been to leave maximum freedom of action to individuals in the development of the city, reaffirming the principles of economic liberalism and the limitation of public intervention.

Between 1950 and 1970, the most significant demographic and building growth of Cosenza took place, which-led to a fracture in urban development, when the push for

[9] See; Rubino, G. E., Teti, M.A. (eds), *Le città nella storia d'Italia. Cosenza*, Laterza, Rome-Bari 1997; Baccari, R., *Lo sviluppo urbanistico della città di Cosenza tra la fine del XIX e i primi del XX secolo*, in Garella, L. (ed), *Villa Rendano tra musica seta e arte*, Fondazione Attilio e Elena Giuliani, Pellegrini, Cosenza 2013, pp. 91-120.
[10] See among the others: Cersosimo, D., *Cosenza*, in il Mulino" n. 6/17; Francini, M. et al., *La rigenerazione urbana dei tessuti periferici a valenza storica. Declinazioni, possibili scenari e strategie*, FrancoAngeli. Milano 2018; Barresi, S., Campolongo, A., Giannattasio, G. (eds.), *Cosenza. Dimensione urbana di una città meridionale*, Edizioni 10/17, Salerno 1990.

city expansion externally to the historic centre, generated an overturning of the relationship between the old town and the rest of the urban territory[11]. A new urban identity with strong class divisions in the neighbourhoods also impacted the historic centre, where the flight of high and middle classes to the new city was accompanied by the parallel settlement of immigrant families in old buildings. The contradictory choices of the administrations in this period, therefore, were decisive for the historic centre: on the one hand, they satisfied the demand for housing for the working classes, on the other hand, they created the basis of decadence, in an urban and social sense, of the historic centre that has been progressively emptied of the resident population, of productive activities, and marginalized by the planning of new services and urban life which now take place outside the historic centre.

From the 1990s to today, central and peripheral administration policies have promoted a series of initiatives aimed to reacquire historical and architectural values of the town, the symbolic functions of the historic centre, trying to catalyse economic interests around an idea of revitalization based on culture.

Nonetheless, the social and cultural rift with the rest of the city and the progressive decay and marginalization of the historic centre still persist (Fig. 2).

Yet, according to a traditional taxonomy of culture and creativity in the urban context[12], the historic centre of Cosenza presents many elements that would make it a highly suitable location for cultural production: valuable historical architectural heritage - churches, the castle, collegiate, noble palaces -, various archaeological traces, numerous libraries, a theatre, study centres and cultural institutions, art galleries and many national, municipal and private museums. The traditional places of culture seem to have failed to become elements of urban and social regeneration.

N.S.

Culture-based strategies: some reasons for failure

Decades of isolated interventions in the historic centre of Cosenza have not interrupted its progressive material and social degradation. They have shown the absence of integrated policies explicitly aimed at combating poverty, and at social inclusion in correlation with the restoration of buildings and the redevelopment of urban spaces.

[11] During the 80s, while Cosenza tends to lose its attractiveness, effectively contracting the population, people and families move to the municipalities of the urban hinterland, where since 1972, the University of Calabria's settlement has become a strong element economic boost.

[12] Hristova, D., Aiello, L.M., Quercia, D., *The New Urban Success: How Culture Pays*, *ArXiv* abs/1804.03760 (2018): n. 27, accessible at https://arxiv.org/pdf/1804.03760.pdf (last access 14/09/2020).

Fig. 3
View of one of the most degraded neighbourhoods in the historical centre of Cosenza (photo by N. Sulfaro, 2019).

Among the several reasons for the failure, public interventions rarely concerning the restoration and renovation of private buildings stand out, which naturally constitute the most significant part of the historic centre. While the public heritage has been largely restored and reused - the headquarters of the Province, Palazzo Arnone, which has become the National Gallery, the transformation of a historical building into the National Library, just to mention some main examples -, one of the principal emergencies of the historic centre remains the degradation of private buildings and the living conditions of the inhabitants[13]. The social and cultural unease within the historic centre has been exacerbated by a strong presence of foreigners, mostly migrants and Rom, coming from the eviction of a nearby nomad camp, in 2015. They have occupied abandoned buildings, generating conflict with the few remaining original residents. The new inhabitants obviously have little knowledge of the culture and history of the old town, perceiving only the negative representation linked to social tensions, abandonment and the absence of services.

[13] The *Piano Operativo "Cultura e Turismo" (FSC) 2014-2020 (Delibera CIPE n. 10/20f8) Contratto istituzionale di sviluppo (CIS) "Cosenza - Centro storico"*, which assign 90 millions of Euros for the relaunch of the historical centre of Cosenza through culture-based strategies, still in definition phase, also excludes interventions on private buildings.

In this perspective, despite the presence of numerous cultural testimonies, the current administration is struggling to re-define the identity of the city through the use of myth, trying to link its past to the Visigoth king Alaric who, according to legend, after having sacked Rome in 410 AD, found his death near Cosenza and was buried together with part of the rich booty at the confluence of the Crati and Busento rivers.

We have to say that, during the 1990s, the municipal administrations carried out redevelopment programs promoting various initiatives by focusing on the reacquisition of identity based on the cultural heritage of the city, on the recovery of the values and functions of the historic centre and also trying to catalyse economic interests around this idea of urban regeneration. However, even in that phase, the adopted strategies did not succeed in having a full impact. Cosenza was admitted to the "Piano Urban" program which constituted the main financial tool of the implementation of the redevelopment of the historic centre by the administration, with a view to intervene with an integrated approach, providing both restoration and new services aimed at reducing risk of poverty and social exclusion. However, concentrating the funding of the "Piano Urban" program only on the historic centre was considered too risky, so the administration preferred to support "light" actions aimed at recreating some level of repair of the urban fabric between the historic centre, the new city and the suburbs and at supporting cultural initiatives, favouring the transfer of university and commercial activities to the old town. Towards the end of the 1990s, a so-called "Contratto di quartiere" (neighbourhood contract) in Santa Lucia, one of the poorest areas of the old town, was initiated. For the first time, public intervention was deliberately aimed at supporting inhabitants and revitalizing the social fabric of the historic centre. The contract was blocked and, in the following period, with it also the process of rebirth of that part of the historic centre (Fig. 3).

The lack of success of the described interventions; demonstrates how the revitalization strategies of historic centres cannot be entrusted only to cultural policies intended as adaptive reuse of architectural heritage and enhancement of the cultural entertainment and leisure offer, but should go through a social requalification "from below" through actions aimed at raising awareness, education and enhancement of resilience against possible economic and social shocks, as the Covid-19 pandemic has shown.

In this perspective, cohesion policy can contribute to supporting processes of integrated enhancement of cultural heritage, both tangible and intangible, launched in large urban circuits and large territorial systems, capable of making the offer more attractive, modern and appealing, and thus broadening the demand side - and more generally of cultural participation - by both local communities and tourists. But it can also strengthen the economic sectors and business chains connected to the protection, conservation, use, promotion,

and management of cultural heritage, in synergy with the investment in infrastructural equipment, to increase their competitive specialization, and strengthen their capacity for territorial integration. Finally, it can represent the tool for experimenting participatory and partnership forms in the reuse and management of cultural heritage assets, and more generally, of public assets otherwise abandoned or not used, capable of creating new values for local communities, not limited to the purely financial ones, rather favouring the establishment of new economies.

Should this not happen, 'culture' will always struggle to be a real driver in terms of revitalizing marginal areas, especially in the southern parts of the country, both in terms of economic and social cohesion.

N.S.

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QUOTA: A MOUNTAIN VILLAGE'S STRUGGLE FOR SURVIVAL

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The photo plan of the village of Quota realized with the images taken by Drone and elaborated with techniques of photo modeling 3D S.f.M.

Quota, (a small village in Tuscany, Italy) rises on the eastern side of the Pratomagno massif, the mountain around which the initial stretch of the Arno river extends, from the springs on Mount Falterona crossing the Casentino valley and lapping Arezzo, to then continue in the direction of Florence.
In 2016, an in-depth study of the village of Quota began with a 3D laser scanner survey, following the established interest in historic centres of Casentino. In the meantime, several micro redevelopment projects of the village were conducted, one of which was completed thanks to the collaboration between the Municipality of Poppi and the DiDA Department of Architecture of Florence University.
During the survey, examples of a building in danger of being lost to history along with its heritage, handed down for centuries by local workers in terms of materials, colours and techniques, were catalogued.
With the advent of the economic boom in the sixties, almost at the same time as the young people were abandoning the village, building methods also changed and the rare renovations carried out in the two decades were entirely disconnected with the urban and environmental context. However, following the repopulation of the village by those who had abandoned it but who, having reached retirement age, returned, a series of restorations more respectful of local tradition were carried out.
Unfortunately, the generation that re-inhabited the village has now almost disappeared, so Quota like many other small suburban centres is once again facing a challenge for its survival.

Keywords: Casentino, historic village, documentation, enhancement, recovery, revitalization

Introduction

The village of Quota is one of the mountain villages that animate the valleys of Casentino, surrounded by chestnut forests on the road that climbs towards Pratomagno. It still looks like one of those "stone" villages dominating the superb panorama of the Teggina valley, the stream that flows from the mountainside into the Arno (Fig. 1).
Sure enough, from the peaks of the Casentino valley, and in particular from Mount Falterona, the Arno River, fed by numerous ponds and streams, flows through it almost as far as Arezzo and, turning around the Pratomagno massif, heads towards Florence (Fig. 2).
The research, which began in 2016, set out to add to the knowledge of the town as well as to identify the construction processes of traditional building in danger of being lost, along with the heritage handed down for centuries by local workers, in terms of materials, colours,

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Fig. 1
View of the village of Quota coming from Poppi.

Fig. 2
Map of Italy with the location of Casentino and the cities of Florence and Arezzo.

methods and ancient know-how, memory of a past closely tied to our culture, a link between past and future.

The study of the village of Quota, as well as being dictated by personal familiarity with the places, and sentimental reasons, is part of a broader work on the villages and monuments of Casentino. This included the town of Poppi, where the Count Guidi family centred their power until the fifteenth century, exerting a great influence on the fate of the entire valley (Pancani 2017).

The investigation method focused on surveying the village with 3D digital technologies so as to construct a metric-morphological database, able to reproduce a cartographic base, used to assess the state of preservation of the village and investigate the building diagnostics, as well as to collect the evidence found during cataloguing of both tangible and abstract knowledge of the area. Moreover, by reading the survey in transparency, various levels of information were drawn from the architectural stratifications, the basic consequence of the evolutionary events of the historic, economic and social history of Quota. The proposed objectives were to report and catalogue an entire series of architectural

features that are in danger of being lost, and with them that legacy handed down for centuries by local workers basically consisting of a set of technical knowledge and empirical know-how (Molducci, 2015). Facilitated by today's computerised procedures, a synthetic but significant amount of information regarding the materials, colours and techniques adopted was collected, memory of a past closely related to building methods, a link between the past and the future.

Historical investigation

The origins

The historical heritage of the smaller Casentino villages is for the most part still little known; from the 1990s onwards a number of scholars have devoted themselves to the revaluation of

these villages reflecting a type of building wrongly considered minor, and too often forgotten. This work, developed over the last three decades, has contributed to understanding how this type of settlement played a very precise role from a historical point of view and has, at the same time preserved the traces of an architectural memory worthy of particular attention. The studies begun around 1990 by Marco Bini and Elisabetta Pieri on one of the most interesting villages in the Teggina valley, Raggiolo (Bini, 1995) contributed significantly to the investigation of these topics Here, we refer, in particular to the research included in conference proceedings on the minor architectural heritage of Casentino[1]. Since then there has been further research in the field, again on the diffuse heritage of the Casentino including by Guido Vannini and his collaborators from the Medieval Archaeology faculty of the University of Florence (Vannini 2020).

However, historical information about the village of Quota is scarce, as are studies concerning the settlement, which has often been only marginally described.

The origin of the village remains shrouded in mystery: untangling the events that led to its origin is not an easy task and one to be entrusted mainly to documentary sources even if unfortunately lacking for the most remote periods. In the 1980s, some findings which suggest human presence at the beginning of the imperial age came to light in the territory of Quota, in the locality of Maestà di Fornace, along the road rising to Pratomagno from the village. It is to this era that the "roofing tiles, sporadic fragments of "Aretine ware and unpigmented pottery" refer, archaeological evidence that can be found in other sites of the Valley, at Ortignano and Villa Uzzano a Monte[2]. Moreover, precisely because of the territorial area to which this valley belonged in the Roman period, the land must have been centuriated[3] even at high altitudes and, although only a few traces of this "divisio agri" from the Roman period remain, they could testify, together with the above-mentioned finds, to the presence of a primitive settlement in the area[4]. The Roman settlement at Maestà, at about 800 m. above sea level, does not coincide with the building of our village, which presumably originated for other purposes and reasons in the second half of the sixth century AD.

[1] Nel convegno sul patrimonio architettonico minore diffuso del Casentino furono presentati numerosi interventi che servirono a fare un quadro complessivo degli studi in cui versavano i borghi minori del Casentino. Among the various contributions see: *Il patrimonio architettonico minore diffuso del Casentino: Raggiolo e la valle del Teggina*, edited by P. Schiatti, Study conference proceedings - Ortignano Raggiolo, Città di Castello 1995.
[2] L'unica fonte per le ricerche archeologiche nella zona sono i rilevamenti effettuati dal Gruppo Archeologico Casentinese, Cfr. *Nuovi contributi per una carta archeologica del Casentino*, a cura del Gruppo Archeologico Casentinese, Arezzo 1989, p. 72, tav. IV.
[3] Ricordiamo come la centuriazione fosse la divisione regolare del terreno in lotti tale da prevedere e consentire la gestione relativa all'aspetto agrario, sociale, produttivo e fiscale.
[4] Allo stato attuale degli studi è impossibile stabilire o anche solo ipotizzare quale civiltà anteriore a quella romana potesse essersi stabilita nella valle del Teggina.

The most reliable hypotheses are those formulated by Alberto Fatucchi, based in particular on the study of toponymy, often corroborated by archaeological finds from the Roman or early medieval period[5].

The toponym Quota, in the spoken language Coita, as we find it mentioned in medieval documents, comes from the Gothic word "Goita", which would suggest an Ostrogothic settlement: this is also true of the site, also called Quota, near Montauto di Talla. According to Fatucchi, the two quotas "are part of a series of anti-Lombard defence points, founded in the 6th century, both along the Roman road at the bottom of the valley, at the opening of lateral valleys, such as Filetto, Uzzano, Poggersona, Lorenzano, S. Apollinare di Subbiano, and on the crests running between Subbiano and Pratomagno". The scholar identifies Quota as a control point on the ridge path that led to the passes of Pratomagno, specifically to Gastra. Quota is defined by Fatucchi as "the clearest evidence of the Ostrogoths", in that remote phase during which the inhabitants were at the service of the Byzantines. After the death of Emperor Justinian who, with the Pragmatic Sanction of 554, had temporarily re-established order in his own territories, the Byzantines found themselves having to face the invasion of the Lombards from Pannonia in northern Italy in 568. The Byzantine leader was forced to defend the Empire by exploiting the impervious Apennine and pre-Apennine routes, such as those in Casentino, as much as possible This is how the strategic territorial garrisons came into being, relying on people of Gothic origin who had joined the Greek army and were permanently present on the territory. They were therefore entrusted with the task of founding these sites and defending them militarily in an extreme attempt to stem the Lombard advance. Quota was probably one of these garrisons.

With the definitive Lombard conquest of Tuscia in 569, the importance of the Teggina valley did not diminish; as with the nearby Raggiolo. Quota too, with its naturally well defended position, "morphological and pedological" characteristics of the area, proved to be decisive for the Lombard settlement which, especially in the first period of its domination, added to the development of an economy based on exploitation of the woods and the pasture.

The ancient church of San Michele Arcangelo, particularly venerated by the people of Lombard origin would appear to testify to the Lombard settlement in Quota. The remains of the church were found by Paolo Schiatti (Schiatti, 1995) in a ruined rural building (Fig. 3) not

[5] Essential and almost exclusive in this case is the work of Alberto Fatucchi with some contributions on the history of the Lombard period in Casentino. In particolare, si veda: A. Fatucchi, *Aspetti dell'invasione longobarda del territorio aretino*, Arezzo 1975, pp. 3-8, 38-45, 69-85; Id., *Note sui Longobardi e la diocesi aretina*, in "Atti del VI Congresso Internazionale di Studi sull'Alto Medioevo" (Milano 21-25 ottobre 1978), Spoleto 1980, pp. 401-15. *Alle radici della storia della Valle del Teggina in Casentino*, in "Il patrimonio architettonico minore diffuso del Casentino...", op. cit., pp. 13-25.

Fig. 3
The ancient building in St. Angelo, where you can see the remains of the Church of San Michele Arcangelo (photo of 1995.)

far from Quota, near the stream called Fosso del Cavallino, still owned by the church, as is the adjoining farm. As early as the thirteenth century, documents refer to two churches in Quota: one inside the village, dedicated to St. John, and that of Sant'Angelo, or St. Michael the Archangel[6]. Fatucchi deems the foundation of the church as reasonably related to the worship of water, to be regarded as the main place of worship in the valley until the 12th century.

The scarcity of information on the Teggina valley, and in particular on Quota, prevents further hypotheses, especially for the period before the year 1000. Even in the period of Carolingian domination, we cannot but imagine a situation still based on the exploitation of the woods and pastureland, and consequently a clear continuity of appropriations and customs already existing in the previous centuries. A situation closer to the present not just for Quota, but in general for the entire Teggina valley can be delineated starting from the period characterized by the fortification phenomenon in the Arezzo area between the XI and the XIII centuries. Fortification, at least until the 13th century, had no significant effects on the previous structure of the village. The defensive network consisting of various fortified villages added to the previous settlements: in Casentino, unlike southern Tuscany and Lazio, the transfer and centralisation of the populations within the "castra" did not occur[7].

[6] Cfr. *La visita pastorale compiuta nel Casentino dal Vescovo Francesco da Montepulciano (1424)*, a cura di F. Coradini, Anghiari 1941, p. 301. Nella visita pastorale del 1424 la chiesa di Sant'Angelo viene riferita a Raggiolo che mancava di una chiesa pubblica.

[7] Sull'incastellamento del Casentino vedi oltre a A. Fatucchi, *op. cit*, p. 22; O. Muzzi, *L'incastellamento del*

More than half of the fortified sites in Casentino, 18 out of 23, as Bosman points out, were not built ex *novo* but on already existing sites. They were provided with walls, moats and towers, very frequently only the highest area was militarily manned for defence reasons.

From the 11th century and in the following century throughout the West, the castle also became a symbol of military and feudal power, a strategic structure for the control and exploitation of the territory.

In these centuries, especially with the expansion of the Counts Guidi in Casentino, the valley of Teggina was again confirmed as one of the most important strategic sites for anyone who wanted to assert power over the entire Casentino region. The valley was once again the subject of two warring powers: the Guidi and the Tarlati. The feudal power of the Counts Guidi extended over the broad territory from Ravenna and Forlì extending to the provinces of Florence, Pistoia and Arezzo, and the Teggina valley was an important outpost against the territorial supremacy of the Tarlati of Arezzo[8].

It was these years of bitter struggles that the Tarlatan first news and documents we found on Quota in the course of our research date back to. The village was one of the countless feuds of the Counts Guidi. As a matter of fact, the privilege in which Emperor Frederick II confirmed the sons of Count Guido Guerra, by then deceased, "more than two hundred castles" among which "Coita" is named[9] dates back to 1220.

The conflict between the Guidi and the Tarlati had led to a proliferation of castles[10]. The fortified site of Quota and the Fornace fortress are mentioned in Bandini's *Odeporico del Casentino* as fiefs of Aghilolfo di Guido Pace, grandson of Aghilolfo di Guido Guerra; Aghilolfo, the last son of Count Guido Guerra and Countess Gualdrada, was probably given Quota

Casentino (secoli XI-XIII), e F. Bosman, *Il Casentino nei secoli XI e XII: la comparsa dei siti fortificati*, in *I castelli nel territorio casentinese*, a cura di Scramasax, Catalogo della mostra (Bibbiena-Castel San Niccolò-Pratovecchio 1990), Firenze 1990, pp. 13-17; 19-50.

[8] Sui Conti Guidi la bibliografia è molto estesa, in questo contributo si è preferito limitarsi a citare quelle fonti, prevalentemente manoscritte, che potessero fornirci delle notizie inedite su un paese, come Quota, mai stato oggetto di una trattazione sistematica. Oltre all'*Odeporico del Casentino* di A. M. Bandini, del XVIII sec. conservato presso la Biblioteca Marucelliana di Firenze, esistono altri due importanti testi: S. Ammirato, *Albero e Istoria della Famiglia de' Conti Guidi*, con le aggiunte di Scipione Ammirato il giovane, Firenze, 1640, pp. 5-10, 46-51, 78; l'altro testo è quello di Ildefonso di San Luigi, *Istoria fiorentina di Marchionne di Coppo Stefani*, Firenze 1770-89, vol. VIII (1777), pp. 96-103. Notizie più generali sulla dominazione dei conti Guidi sulla valle del Teggina si trovano in M. Bicchierai, *op. cit.*, pp. 21-27.

[9] The news, unpublished, is reported by Ildefonso da S. Luigi, *op. cit.*, pp. 96-103.

[10] A. Fatucchi, *op. cit.*, pp. 22-23 parla di castelli riferendosi ai comuni di Raggiolo, Ortignano, Montebene, Uzzano, Teggiano, QUOTA, Giogalto, Giocatoio, eccetera. L'autore attesta che date certe, piuttosto alte per la sua esistenza, si hanno solo per Ortignano, documentato nel 1029 e nel 1065. Riguardo a molte di queste fortificazioni l'autore si chiede se il "centro fortificato dell'incastellamento dopo il Mille recuperi il sito di un fortilizio della prima generazione, cioè del periodo delle invasioni barbariche (V-VII s.), e se fra le due fasi ci sia una continuità insediativa. Peraltro, è questo il dubbio che suggeriscono i dati archeologici per Fronzola, Ortignano, QUOTA, Montebene Uzzano". È molto difficile dare una risposta a questo quesito -poiché si tratta di un territorio in cui l'antica ascendenza barbarica si ravvisa fino al XII secolo e quindi è quasi impossibile non pensare ad una continuità insediativa risalente alla seconda metà del VI secolo.

Fig. 4 and 4a
The terracing in the locality of San Giovanni alle Balze in which they are evident materials of recovery from buildings of greater relief in fig.4 is visible also the arc (inverted) of a single-hole.

and other territories belonging to the Romena Castle and Fortress[11]: later, his son Guido Pace and then his grandson Aghilolfo would be remembered as Counts of Romena. Until about 1280 Quota was part of the estate of this branch of the Counts Guidi. At the beginning of the 14th century, for dynastic reasons at the moment not clear, Quota passed from Aghilolfo to Count Guido Novello II, who in the first decades of the century, acquiring the title of Count of Raggiolo, took residence there to exercise his feudal power over the Teggina valley[12].

At the end of the 13th century, as seen from the tithes due to the Church of Rome for the years 1274-75, 1278-79[13], and lastly 1302-03[14], two churches are referred to in Quota: the church of Sant'Angelo, outside the village (i.e. San Michele Arcangelo), and the church of San Giovanni, inside, or in any case in the immediate vicinity of the 'castrum', to which the care of the population living in the area protected by the walls was most probably entrusted. In this regard it should be borne in mind that, in 1995, in a survey conducted for the degree thesis "Il nucleo Antico di Quota"[15], following the path called "Strada per San Giovanni alle Balze", a series of worked stones were found which had

[11] Cfr. A.M. Bandini, *ms. cit.*, vol. VI, c. 4r.
[12] Cfr. M. Bicchierai, *op. cit.*, pp. 25-26.
[13] *Rationes Decimarum Italiae nei secoli XIII e IV. Tuscia. I. La Decima degli anni 1274-1280*, a cura di P. Guidi, Città del Vaticano 1932, nn. 1519, 1521, p. 70; nn. 2242-43, p. 97.
[14] *Rationes Decimarum Italiae nei secoli XIII e XIV. Tuscia. II. Le Decime degli anni 1295-1304*, a cura di M. Giusti e P. Guidi, Città del Vaticano 1932, nn. 2210-11, p. 123.
[15] Pancani G. . (1994-1995), *Il Nucleo Antico di Quota*, Tesi di Laurea in Architettura, Relatore Bini M., Correlatore Pieri E., Università degli Studi di Firenze, Facoltà di Architettura, pp. 22-23.

been reused to build the dry-stone walls constructed for terracing the land (Fig. 4 and 4a). However, it is presumed that the foundations of the church of San Giovanni date back to the period of the fortification between the 11th and 13th centuries.

Towards the end of the 1300s, the "villa di Cuota" came to the "second Count Ruberto da Battifolle, Count of Poppi", and from him to his son Francesco who, having allied with the Duke of Milan against the Florentines in 1440, after the battle of Anghiari was banished from his lands[16], so that Poppi passed, with the other territories pertaining to it, to the Florentine Republic.

Again, from documents related to religious buildings a few, fragmentary facts about Quota in the fifteenth century may be gleaned: in the pastoral visit to Casentino by Bishop Francesco da Montepulciano in 1424 the village had only the church inside the castle, that of St. John, which depended on the plebiscite of Buiano. The building is in good condition even if poorly decorated, but "Corporale immundum. sacramenta non habet". At this date the church of Sant'Angelo had already been assigned to the care of the souls of "Rasolo", that is Raggiolo, and no details about its state of preservation are provided[17].

It is not until the beginning of the XVI century, that the *Decime Granducali*, offer the first useful elements for reconstructing the ancient nucleus of the village. Quota is referred to as "Chastello", and the "mura di Quota", and the "porta di sotto" are also mentioned. The written source speaks of a fortified site with walls that, although perhaps no longer in existence

[16] S. Ammirato, *op. cit.*, p. 46. Molto importante anche per le notizie sul passaggio alla Repubblica fiorentina.
[17] La Visita Pastorale compiuta nel Casentino dal Vescovo Francesco da Montepulciano (1424), edited by F. Coradini, Anghiari 1941, pp. 15-17 nn. 297, 301-302.

at the time the document was written, were still attested by place names. The "borgho di Quota" is also mentioned and appears several times in the eighteenth-nineteenth century land registers[18].

The next tithe, compiled around 1554[19], confirms much of the previous information[20], and adds some other valuable clues. In fact, there is mention of a hospital[21], the town hall building, and a castle square. The town, therefore, appears already delineated with its main buildings, still visible or at least handed down by place names: the castle, the town hall, the church, the hospital and, all around, the walls, of which one of the gates is remembered. In the document, for the first time, houses and outbuildings are also named: the houses are located in the village but no details are given, while for the outbuildings, besides the mention of "a hut with threshing floor", which is mentioned as far back as the eighteenth-century land register,"al borgho di quota una schala con una stalla" is mentioned twice: a structure hardly comparable to those mentioned in the documents closer to our time. In the *Tithes* compiled between 1636 and 1641, in which about seventy entries are reported, we find only one new toponym, the "loggia"[22].

No other document enlightens us on the situation of the village and its economic development for the period from the XV to the XVIII century: the loss of strategic importance marked the end of the interest that this valley had aroused in the Casentino: life increasingly depended, as may be deduced from the entries in the *Decime* already mentioned, on the cultivation of the chestnut and on livestock, on an economy that, substantially poor, was hardly self-sufficient. In this sense the little information needed for even a partial reconstruction can be inferred both for the late medieval period and more indeterminately for modern times, from general studies on the development of the "chestnut civilization" in the Casentino area[23]. According to a tradition originating in the Lombard and Carolingian periods, as already pointed out, this area had always stood out for

[18] A.S.F., *Decime granducali*, 6875bis, (16th cent.), cc. 19v, 24r, 25v, 41r, 46r, 53v, 54r-v, 58v.
[19] A.S.F., *Decime granducali*, 6876 (1554). I contribuenti sono 67. Notizie importanti alle cc. 6r, 9r, 10v, 16v, 17v, 18r,22v, 26v, 29v, 39r, 47r, 50r, 53r, 57r, 61r.
[20] Vengono nuovamente ricordate: "la porta di sotto" (c. 6r carried by Lucha di Piero di Matteo; 29v carried by Giovanni d'Andrea d'Antonio; c. 39r carried by Pasquino di Piero di Giovanni), the "castle" (c. 18r carried by Jacomo di Domenico di Filippo; c. 50r carried by rede di Gabriello di Stefano; c. 53r carried by Pasquino di Sancti), "Dentro alle mura del castello di Quota" (c. 26v carried by Agnolo di Meo di Togno).
[21] A c. 16v nella portata di Tadi di Giorgio di Tadi.
[22] A.S.F., *Decime granducali*, 6877 (1635-41), cc. 10r, 31r, 65v.
[23] Gli studi sulla civiltà del castagno sono stati svolti ed approfonditi da Giovanni Cherubini principalmente per il periodo basso-medievale. Cfr. G. Cherubini, *La "civiltà" del castagno alla fine del Medioevo*, in "L'Italia rurale del Basso Medioevo", Bari 1984, pp. 147-71, 291-305; e *Fra Tevere, Arno e Appennino. Valli, comunità, signori*, Firenze 1992, pp. 40-69. Per il periodo dei Conti Guidi è doveroso accennare alla lavozione del ferro a Raggiolo e in generale sul Torrente Teggina, che già attestata da R. Davidsohn, *Storia di Firenze*, Firenze 1965, vol. IV parte II, pp. 49-50, e ora ampiamente documentata da M. Bicchierai, *op. cit.*, pp. 65-71. Questa attività non è allo stato attuale riferita al nostro piccolo centro urbano.

the presence of chestnut groves and their cultivation, destined to play a decisive role in the following centuries[24]. The continuity of such cultivation "had occurred through centuries of human endeavour, probably largely attributable to the late Middle ages, which had expanded at the expense of oak groves and other plants. The nearby village of Raggiolo, at least since the fifteenth century, had given its name to a quality of chestnut that still exists today"[25]. However, it may be hypothesised that production was mainly related to local consumption, particularly after the Florentine conquest. The above-mentioned sixteenth-century *Grand Ducal Tithes* , which mainly mention 'chestnut' lands, as well as much 'wild' land, rarely mention 'buildings' related to the production and storage of chestnuts, as amply documented in the *Leopold Land Registry*, nor do they mention structures suitable for livestock breeding, another notable resource of the area, especially at the time of the Counts Guidi, who owned a large number of flocks[26].

Only with the compilation of the descriptive *Land Registers* with parcels, relating respectively to the eighteenth and nineteenth centuries, the surveys carried out by Pietro Leopoldo in Casentino in 1778 for drafting the *Reports on the government of Tuscany*, and the *Statistics of all the Communities that make up the District of the Subprefecture of Arezzo requested in the year 1809 by the French Government*, was new information provided on the Teggina valley and, even if with much difficulty, on the village of Quota and on the architecture mainly related to the economic reality already outlined in the previous centuries.

Character and evolution of the town from the eighteenth century to the present day.

The above historical *excursus* helps to explain the development of the village of Quota from the XVIII century to today; the fortification configuration as a defensive place facing the Teggina stream, which strikes any traveller who comes here, the sylvan-pastoral economy dating back, as already written, to the Lombard period, the secluded position in relation to the most important communication routes, are characteristic traits that can be partly read in recent history[27].

In particular, the *descriptive land register*, the compilation of which began around 1713 up to around 1830, with additions and changes, gives us a detailed picture of the settlement

[24] Una certa tradizione storiografica ottocentesca fa addirittura derivare il nome di Quota dalla quota parte di castagne che i Conti Guidi si dividevano, stando a quanto riportato da P. Porcellotti, *Illustrazione critica e descrizione del Casentino*, Firenze 1865, ed. anast. Sala Bolognese 1977, p. 107.
[25] Cfr. G. Cherubini, *op. cit*., 1992, p. 43.
[26] Cfr. G. Cherubini, *op. cit*., 1992, pp. 46-53.
[27] Cfr. gli Atti del Convegno di Studio svoltosi a Ortignano Raggiolo nel 1995.

and economic situation of Quota[28]. The town as a whole is situated around three hamlets overlooked by most of the houses: the Borgo della Chiesa and the related Piazza[29], already mentioned in the sixteenth century, the Borgo della Torre, sometimes also called Piazzola[30], and the Borgo Fornaccio[31]. It is mainly around the first two hamlets that the urban structure of the town is organized. The church of St. John the Baptist, to which reference is made, is not the original with medieval foundations since, as we learn from the same document "a ruined cottage where the church of S. Giovanni Battista Vecchia was located" is listed.[32]. As mentioned in the previous paragraph the remains of the ancient church are thought to have been located along the current "road of San Giovanni alle Balze", about sixty metres down from the junction with the road that leads from Sant'Angelo to Quota. This hypothesis is supported by the place-name "San Giovanni alle Balze", and by the presence of a terracing of regular appearance supported by walls made with reused stones rough-hewn into an almost rectangular shape, (Fig 4 and 4a) which do not find any correspondence with the type of material used for the construction of the terracing. One of the stone blocks that make up the terracing is, we believe, similar in shape to those that form the arch of the single-light windows of religious buildings of the Romanesque period. Until the beginning of this century, as we were told by the elders of the village, it was still possible to see the remains of a cottage that the population identified as the old church of San Giovanni alle Balze. The more recently founded church appears to have "two Altars, its Bell Tower, and Bell with a cemetery on the west side"; it was a very rich property being endowed with a good number of landed properties in the surroundings[33]. Adjacent to the church there was, in addition to the "rectory", the Hospital of S. Andrea, "a house for the use of the Spedale de Poveri", also owner of landed property[34], and the Confraternity of *Corpus Domini*, of which we have only seventeenth-eighteenth century testimonies because of the loss of the Books and Records fol-

[28] A.S.A., *Catasto Antico, Quota n° 1*, a. 1713 e sgg. (Catasto descrittivo), a cui si farà riferimento per le citazioni documentarie; anche in A.S.F., *Decime granducali*, 6878, (1713-18), in questo senza le aggiunte dei decenni successivi.
[29] Ricordato in moltissime portate si accenna soltanto ad alcune di esse, per es. alle cc. 37r, 46r, 57v, 90r, 126r, 204r, etc.
[30] La "piazola" è già ricordata nelle *Decime granducali, 6876*, a c. 47r e nella decima di Mencherino di Santi da Tequinano. Nel Catasto in questione il vocabolo è riportato molte volte a c. 82r "Alla piazzola o Torre di Quota" nella portata di Bartolomea di Giovanni Moretti, a c. 84r, 94r, 105r, 109r, 117r, 148r, 152r, 159r, 162r, etc.
[31] Nello stesso documento questo borgo ha solo tre unità insediative: a c. 88r, 181r, 258r,
[32] Si veda, c. 302v.
[33] Alle cc. 296r e sgg. (beni non paganti) alle cc. 304r e sgg. (beni paganti). La chiesa è la maggior proprietaria di beni fondiari di tutta la comunità.
[34] Lo stesso, presumibilmente, trovato nei documenti cinquecenteschi e la cui istituzione doveva essere precedente a quel secolo. Vedi cc. 310r-311v. I terreni di proprietà dell'Ospedale erano dati a livello ai fratelli Coccolini vedi cc. 262r-263v; 268r-269r; 272r-272v.

lowing the Leopoldine suppressions[35]. In 1671, the brothers and sisters spent 4 liras "to cover the roof over the altar" of their church, and at the same time had a canopy and wooden crucifix rebuilt[36]. In the Borgo, the presence of a loggia that opened near the church is mentioned in some land register entries[37], probably the same mentioned in the tithes of the mid-seventeenth century[38].

We have no information about the hamlet called "la Torre", the name of which certainly refers to the remains of a building that was part of the medieval "castle", nor about the other hamlet, "il Fornaccio", which could very generically refer to the presence of an oven, perhaps for communal use, a traditional and fundamental element in the economy not only of the town, but of the whole area.

Of the approximately one hundred land register entries referring to inhabitants and land owners in Quota, sixty-eight mention the house, and in addition to it in many cases other buildings of great utility to the economic life of the country. The dwellings, preferably located within the village, in the three hamlets already mentioned, had to be low and maximum two-storey, however in one entry reference is made to the number of rooms[39], which in general is not specified. Out of the total, twelve houses they had the 'verone' in front, namely "the covered porch in which the external staircase of country houses in Tuscany ends and which is sometimes-communal, even containing an oven"[40], a significant element since there are now few houses left with such feature[41].

The presence of those buildings supporting the economic and productive life of the community is widely documented, structures that must have strongly characterized the village and its surroundings: ovens, dryers and huts. There were six ovens[42], and in all likelihood they were sufficient to serve the entire small community, which in the period shortly after the one referred to in the Land Registry, in 1745, had only 183 inhabitants[43]. The number of "dryers"

[35] See, cc. 297r-280r.

[36] Di questa Compagnia laicale si è conservato un unico registro che non ci dice niente riguardo alla sua origine. Si consulti, A.S.F., *Compagnie Religiose Soppresse da Pietro Leopoldo, 2366, Libri di entrata e uscita della compagnia del Corpus Domini di S. Giovanni Battista di Quota (1671-1785)*. Per le notizie citate Cfr. c. 98r.

[37] Cfr. le portate di Donna Francesca d'Antonio Fani (c. 146r); di Gregorio di Martino Cuccagni (c. 162r); di Donna Letizia di Angelo Tondi (c. 182r); di Salvadore di Francesco Coccolini (c. 265r); di Donna Maria di Francesco di Bricia da Ortignano (c. 274r); di Donna Maria Fani (c. 291r) .

[38] Cfr. n. 30.

[39] Cfr. la portata di Domenico di Matteo Chimenti (a c. 282r)

[40] Cfr. E. Pieri, *Carattere ed evoluzione dell'abitato di Raggiolo dal Settecento ad oggi*, in "Il patrimonio architettonico minore diffuso del Casentino…", *op. cit.*, p. 52.

[41] Avevano il verone le case a cc. 37r; 46r; 74r; 84r; 88r; 122r; 152r; 163r; 179r; 182r; 242r; 253r. In fact, in the current Borgo della Chiesa, the ancient presence of the porch can be seen, but the restoration of the house performed prevents a certain attestation.

[42] Per i forni Cfr. c. 1v; 122v; 170r; 182r, 234v; 282r.

[43] Cfr. E. Repetti, *Dizionario geografico fisico storico della Toscana*, Firenze 1833-45, vol. IV, p. 577. Di contro nello stesso secolo dalle notizie riportate dal manoscritto del Bandini, ms. cit., nel tomo I a c. 36 la parrocchia di S. Giovanni di Quota aveva la cura di 1234 anime, il doppio circa di quelle che vengono riferite per la Pieve di S. Michele

was also relatively small: four; in three cases the oven and dryer were part of a single unit[44]. Both the oven and the dryers were of primary importance for the economy of the village, insofar as associated with the methods of preserving chestnuts, procedures dating back to at least the late Middle Ages. The chestnut was preserved by drying, "for small quantities in the sun or the heat of an oven, and for large quantities in the smoke of the dryer"[45]. Among the various preservation methods, the most usual, the reduction of the dried fruit into flour, would have required the presence of a mill: there is no mention of it, it may be presumed that this processing took place at the mills of Raggiolo overlooking the river Teggina[46].

A reading of the Land Registry shows that there were a good number of huts, fifteen in all, sometimes built on the land bordering the house[47], most often on plots of land outside the town, used for normal agricultural work[48]. In fact, in addition to the large number of "chestnut" groves, "vines", "apples" and "vegetable" plots are frequently mentioned, even though not very extensive and difficult to cultivate due to the scarce quantity of cultivable and stony land[49]. Land with oak groves can also be found, reduced by man over the centuries in favour of chestnut cultivation. The chestnut land was often used for pasture: mainly for sheep, but also pigs, pigs in particular, having the additional function of cleaning up the forest. Only two stables are mentioned[50], but the shepherds-farmers of the area most probably used premises annexed to their houses not specified in the Land Register.

A further significant element reported in these documents is "a lime mortar kiln" owned by Jacopo di Antonio Ticcetti da Sala (at c. 49r), which was probably sufficient for the construction and maintenance of the buildings of the whole village.

This settlement and economic structure is confirmed by the *Reports on the government of Tuscany*. The settlement of Quota, in 1778, as appears in the *Reports*, was a commune

Arcangelo di Raggiolo, paese limitrofo, più grande e più popolato.

[44] Cfr. per i seccatoi cc. 53v; 1v; 122v; 234v: negli ultimi tre casi formanti un unico nucleo con l'essiccatoio.

[45] Cfr. G. Cherubini, *op. cit.,* 1984, p. 162.

[46] Sulla basilarità della farina di castagne nell'alimentazione della zona dal Medioevo fino al Sette-Ottocento cfr. G. Cherubini, *op. cit.*, p. 154 e sgg. e Sir Robert Dallington, *Descrizione dello Stato del Granduca di Toscana. Nell'anno di Nostro Signore 1596*, a cura di N. Francovich Onesti e L. Rombai, Firenze 1983 (trad. dell'ed. inglese, London 1605 "A Survey of the Great Dukes State of Tuscany. In the Yeare of Our Lord", p. 50.

[47] Cfr. per es. le portate di Giovanni di Santi Bianchi (c. 94r); di Arcangelo di Domenico Madiai (c. 109r); di Giovanni di Domenico Madiai (c. 141r); di Giovanni di Domenico Rossi (c. 152v), eccetera.

[48] Vedi per es. le portate di Marco di Giovanni Gigli (a c. 101r); di Arcangelo di Domenico Madiai (a c. 110r); Agnolo di Domenico d'Agnolo Tondi (c. 173r), eccetera.

[49] Da una foto Brogi dell'inizio del '900 (pubblicata in *Immagini del Casentino. Lo spirito di una valle*, Firenze 1988, p. 44) si può vedere come ancora in un tempo non lontano dal nostro l'altura di Quota e i terreni circostanti, terrazzati, mantenessero i segni del paziente lavoro dell'uomo, perduti completamente negli ultimi decenni di questo secolo.

[50] Vedi le portate di Jacopo e Bastiano Madiai (a c. 118v); e quella di Agniolo di Virgilio Gigli detto Brandino (a c. 148r).

independent of Poppi which it complains of having been annexed to: "The inhabitants of the communities of Fronzola, San Martino and Quota complain with the attached petition that they have been aggregated to the community of Poppi, when before they were all three together as a separate community, and that they have lost the advantages they had at that time and that the duty has been doubled (...)"[51].

There are few other mentions of the village of Quota, named "Quota Castle", but basically the information about the area confirms the presence of well-cultivated chestnut groves and terraced plots[52]. There is also a watercolour dated 1778 with the *View of the Tuscan-Romagnolo Apennines*)) by Antonio Fedi and Francesco Mazzuoli, showing the Teggina stream in the stretch that flows below Raggiolo: only the top of Quota is visible, and a few scattered houses. Although it is difficult to make a comparison with the current state, we can see that in the agrarian landscape of that time the intervention of the hand of man was profound, revealed in particular in the care taken to terrace the land[53].

In the course of the century the situation remained substantially unchanged[54]; however, two facts are relevant: a significant increase in population, and above all the great impulse given to the cultivation of chestnuts.

From the analysis of the data reported in the register of the "Stato d'anime" of the church of San Giovanni Battista di Quota compiled in 1826, we have deduced that the population of the village had almost doubled compared to the first decades of the eighteenth century, counting 261 inhabitants distributed in 56 families, figures maintained in the following decades[55]. It is conceivable that this figure may be related to an increase in the presence of scattered settlements in the surrounding area, as would seem to be attested by the *Land Registry of* 1830[56]. In it there are very frequent mentions of "farmhouse and yard"[57], rarely mentioned in the previous land register, located outside the village, for example in the locality

51 Pietro Leopoldo d'Asburgo Lorena, *Relazioni sul governo della Toscana*, a cura di A. Salvestrini, Firenze 1970, p. 466.

52 Cfr. *Idem*, *op. cit.,* a cura di A. Salvestrini, Firenze 1969-74, vol. II, p.464-466. In effetti fino all'inizio del nostro secolo in questa zona i pastori transumavano con i loro greggi verso la Maremma. Cfr. G. Cherubini, *op. cit*., 1992, pp. 46-53.

53 Manoscritto Cappugi, 308. *Veduta dell'Appennino Tosco-Romagnolo di Antonio Fedi e Francesco Mazzuoli*, 1788-89.

54 A questo proposito è molto interessante il già citato ms. 99 conservato presso la Biblioteca Comunale della città di Arezzo *Statistica di tutte le Comunità componenti il Circondario della Sottoprefettura di Arezzo richiesta nell'anno 1809 dal Governo Francese*, ms. 99, n° 19, cc. 218-228, in cui è tracciato un quadro generale della situazione economica ed insediativa di Poppi con i paesi amministrativamente dipendenti.

55 Cfr. E. Repetti, *op. cit*., vol. IV, p. 577. Il Repetti per l'anno 1840 fa calare la popolazione a 185 abitanti; A. Zuccagni Orlandini, *Indicatore topografico della Toscana granducale*, Firenze 1856, p. 304-5, riporta per il 1845, 324 abitanti, e 345 per il 1855.

56 A.S.A., *Catasto Poppi*, Tav. ind. n° 2 dello stesso, a. 1830 (Catasto particellare).

57 Cfr. per es. cc. 37r; 124r; 140r; 231r, eccetera.

Fig. 5
The village of Quota around 1950.

"Le Lame". As many as 33 "dryers" were located in the neighbouring territories[58] compared to 4 in the previous century. This is the most significant fact, which suggests that the forest was being used increasingly, and perhaps better, for the production of chestnuts and chestnut by-products for the city market. In general, the situation did not change much compared to the 18th century, and what we described for the whole area, namely a substantial general immutability of architectural structures and forms of life, was only abruptly interrupted in the second half of the 20th century, in the middle of the industrial boom. Starting in those years, the building heritage of the village underwent a radical transformation (Fig. 5).

Fig. 6
the "Borgo della Torre" crossed by a flock around 1960.

Fig. 7
Some buildings in the "Piazzetta del Lastro" around 1960.

From the eighteenth century until the 1960s, the houses of Quota appeared according to the plot of lots common to the castle sites of the Casentino hills: a fairly regular structure characterized the buildings, which served both as housing and as a shed for tools and shelter for working animals (fig. 6). The typical house was preferably three-storey, with the stable and the cellar on the ground floor, the kitchen on the first floor, very often

[58] Cfr. per es. cc. 13r; 41v; 143r; 232v; 238, eccetera.

communicating through an internal staircase with the rooms on the top floor. Frequently the attic consisted of a wooden deck that divided the rooms horizontally, reducing the space and thus allowing less heat to escape.

What made the whole town characteristic was the uniformity of the building materials used, typical of a poor economy, and therefore locally produced (Fig. 7). Basically, two materials were used: sandstone and chestnut wood; the masonry was made of stone, with square stones for the cornerstones and "smaller stones for the walls"[59]. The presence of the "lime mortar kiln", the analysis of the mortar of the buildings that have not undergone recent restoration, and the presence in the area of some tuff quarries attest to the fact that the masonry was mainly made of lime mortar and tuff[60] (Fig. 8). For the wooden carpentry, chestnut beams and planks were used, and stone slabs were used for the roof; chestnut wood was also used for the door and window frames.

As far as the outbuildings are concerned, at Quota, until the end of the 1980s, there were still some dryers in excellent condition: generally built with a "hut front with a roof, a small window" through which the chestnuts were introduced, "and a stone step below"[61]. Currently the village has about forty inhabitants, mostly elderly, and has completely lost the economic and settlement characteristics of the past, the signs of which, however, remain. Today you can still walk through the steep paved hamlets of long ago: the Borgo della Torre that goes up to the highest part of the historical centre of the village, recalling the tower of the castle, has a small square in front of it. The current composition of Borgo della Chiesa is of interest.

[59] E. Pieri, *op. cit.,* pp. 56-57.
[60] Una cava di tufo localizzata sulla cosiddetta "torre" di Quota è rimasta funzionante fino ai primi decenni di questo secolo come testimoniano alcuni anziani abitanti del paese.
[61] E. Pieri, *op. cit.*, p. 57.

Fig. 8 e 8a, 1965
Fig. 8 and 2017
Fig. 8a, Some buildings above the boulder on which stands the highest part of the country, these buildings rise on the base of the ancient walls of the Castle of Quota.

The building that gives it its name is probably a 17th century construction, with very sober typological and stylistic features. A marble plaque bears witness to the restoration work carried out in 1929. The interior of the church has a single apsidal nave, two altars placed respectively in the arms of the transept, and a wooden truss ceiling painted in the early twentieth century style. The Crucifix mentioned in the seventeenth-century documents referred to above is preserved in an adjoining room, belonging to the Confraternity of Corpus Domini, still active. In front of the church the rectory looks onto the small square, between the rectory and the church there is a loggia built during the restoration in 1929.

The reconstruction of the events and economy of the village has revealed how the economy of Quota and its valley was based on chestnut harvesting and sheep farming, immediately after the year 1000 until the first decades of the last century, determining the construction of architectural structures and the consequent choice of building materials. According to the sources, at least for the 18th and 19th centuries, the construction methods did not change much with the passage of time, but continued to be closely related to the environment. In this regard, it is useful to emphasize how this architecture, through successive stratifications, maintained a continuity with its past, with the re-proposition

of architectural models and the reuse of materials. For Quota this is even more natural as, closed within itself, the presence of wood and building stone prevented the supply of other materials from distant areas until the last century.

Since Quota has become purely a holiday place for the children and grandchildren of the former inhabitants, an indiscriminate "restoration" has begun that has completely distorted the nature of the site.

Recalling the village of Quota are the silent testimonies of buildings devastated by the inexorable passage of time, past and recent memories of ancient buildings, treasure troves of history, traditions and symbols that still survive today, defying the force of time and man's neglect.

Fig. 9
Survey of the Source of the Bridge, elevation.

Survey Method

The data collected during the laser scanner and photogrammetric surveys were addressed in two different study campaigns, allowing a reconstruction of the state of conservation of the village. The data on the metric-morphological aspects of the village, accompanied by historical research, allowed us to see what events had determined the development of Quota. The first survey campaign focused on specific findings on site, in particular the relationship between the village and its seven water fountains was analysed. The following year, in 2017, the survey focused instead on completing all of the remaining built-up area of the village, however, to date, the groups of houses in the two small hamlets that are just outside the village, "La Valle" and "La Quercia", have not been considered.

During the survey campaign of the "Fountains" (Fig. 9), the focus was on water as an essential asset for human, which in a small mountain village is considered even more precious, since often there are no wells and its supply depends on searching for nearby springs. A project to document and valorise the village considering water as a primary asset for its growth and development centred around the fountains, surveying and subsequently restoring them. In the following campaign, instead, topics related to the urban surveying of the village (Pancani 2017) but also to documenting traditional building techniques, such as masonry with stone ashlars and mortar, and the dry-stone walling used for all the landscape management terracing delimiting the farmlands around the village.

The survey

For the survey of the Borgo di Quota, a "Faro Focus M 70" laser scanner was used for both campaigns, one of the seven fountains conducted in 2016, and one conducted the following year to complete the survey of the whole village (Fig. 10 and 10a). Moreover, as regards the study of the dry-stone masonry techniques, the experience of building a small section of dry-stone wall was documented, using both a laser scanner survey and 3D photogrammetry; in this regard, a video recording of the dry-stone wall construction work was arranged, commented on by Giocondo Ciabatti, the elderly *master mason*, who did the masonry work (Fig. 11 and 11a).

The laser scanning surveys (Fig. 12) were carried out using an acquisition mesh of approximately 0.7 x 0.7 cm, which made it possible to acquire a great deal of metric-morphological information on the artefacts (Fig 13). Thanks to the good quality of the reflectance, it was also possible to distinguish the documented wall textures, from those made with rough-hewn ashlars, to those with ashlars of more ancient workmanship squared and laid in rows, up to the large boulders used for the walls of the medieval fortress. The reconstruction of the work was organized on the basis of a general plan represented in scale 1:100, used for the graphic reconstructions of the individual *hamlets* (streets). In the reconstructions of the various *hamlets* in scale 1:50, the cobbles of the floors and the elevations were accurately described, the latter enriched by the information acquired with the orthophotos of the facades, obtained with3D SfM photomodelling (Gaiani, 2015) (Fig 14). Lastly, the aerial documentation (Fig. 15 and 15a) acquired using a Dji Mavic 2Pro drone, equipped with a Hasselblad camera with a 1-inch CMOS 20 million effective pixels (5472×3648) sensor, allowed the reconstruction of a map of the village's roofs (Parrinello, 2019), one of the architectural elements that, compared to the 1960s, underwent numerous changes in the materials of the roof coverings. From the survey, the layout of the walls of the ancient castrum emerged quite clearly, some

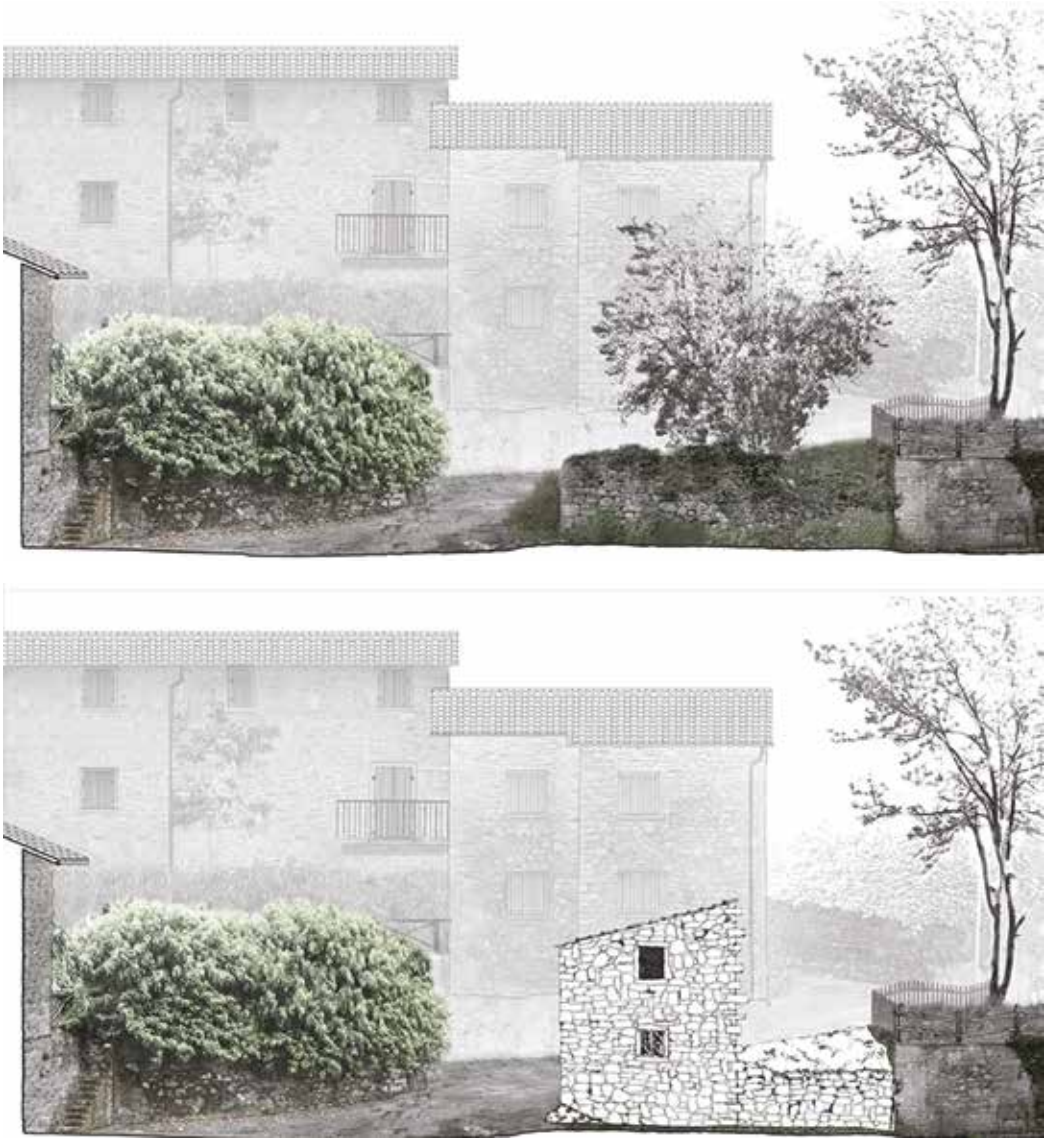


Fig. 10 and 10a
Survey of the "Fonte del Lastro", with insertion of the ruined building recovered with an old survey made in 1986.

Fig. 11 and 11a
The dry wall construction work with the group of students and the master Giocondo Ciabatti.

Fig. 12
The scans in borgo del Lastro.

Fig. 13
The point cloud of the entire Quota country.

traces were already evident at first glance with a simple inspection, others were found by searching in the cellars of the houses that were along the route. However, more detailed considerations will only be possible when, at a later stage, the survey documents are examined by archaeologists specialized in architectural stratigraphy (Fig. 16).

Comments on the state of the Village

In the 1950s, after the Second World War, driven by the hope of improving their economic condition, a considerable part of the population that lived in Quota, as happened in the small centres of the central Apennines, moved towards the big urban centres of the north and centre of Italy. Only a small percentage of the active population remained in the villages of our valleys, as in Casentino, together with the people who were older and had completed or were ending their working life.

In the '60s and 70s the economic growth in Italy as in the rest of Europe allowed many economic and social expectations to be achieved, so that many people returned, even if only for holiday periods, to their native village. In particular a generation of children, born in the new cities where their parents resided, spent their summer holidays in the places of origin of their families together with their grandparents who had not moved to the city. The economic consolidation and the new housing needs of families accustomed to new residential standards of the city, led many people to make substantial investments in the original hamlet, for the renovation of houses, thus giving rise to a virtuous process, which allowed the preservation and survival of the village of Quota.

This process changed the appearance of the village while allowing the restoration of many houses, which by now, due to abandonment, were in a very precarious condition. Unfortunately, however, with the advent of the economic boom of the 1960s, the gradual nature of the construction process accelerated greatly, resulting in a series of restorations completely out of context. As a matter of fact, the building procedures consolidated by tradition were abandoned, new materials were used replacing the traditional ones with effects that were not always successful, such as cement mortars in place of lime, brick roofs that completely supplanted the stone slabs used as roofings, or even aluminium instead of wood fixtures.

However, this flow of money gave rise to a virtuous and significant economic process related to the market for restructuring. Later, many of those who had left the villages in the 1950s in search of new opportunities returned, as pensioners. The now renovated houses were able

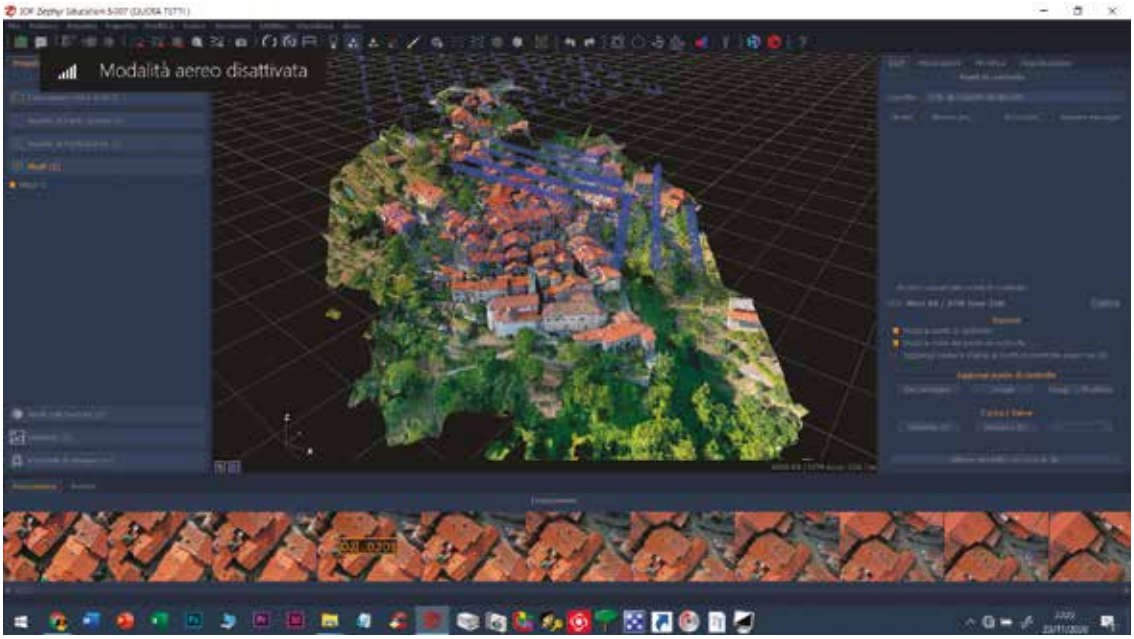
Fig. 14
The "Fonte del Ponte" with view to the buildings above the boulder on which stands the highest part of the country, represented in the elevation with both Iron wire mode with Photoplane obtained by 3D photomodeling S.f.M.

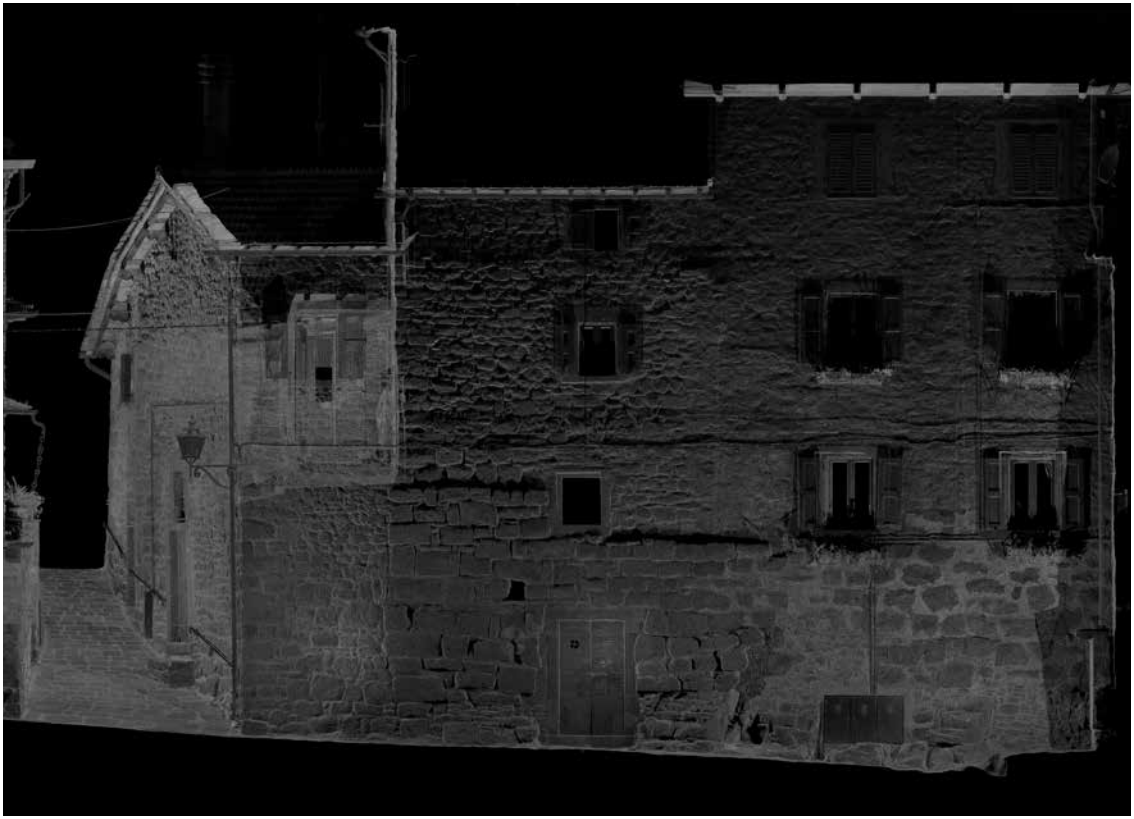
to satisfy the changed standards and comforts of living, so the village of Quota, like many other mountain centres in Casentino, and also of the whole central Apennines, kept itself sufficiently populated, thus guaranteeing the survival of the small commercial activities located there.

The period from the mid-1980s to the mid-1990s coincided with the moment of greatest vitality of the village of Quota. It was in fact in these years that many pensioners moved back, even if only for part of the year, and it was also in this period that a series of restorations began that were more aware and more attentive to the historical and architectural memory of the place of origin (Fig. 17, 18, 19, 20). These interventions recalled the local tradition, using materials more in keeping with the place, such as wood or stone both used or freshly-quarried but cut in the "old way" and with the use of lime-based mortars for filling the joints. Unfortunately, on some occasions there were interventions with jarring effects compared to the pre-existing reality, caused by the lack of knowledge of building traditions and of adequate cultural means to mend the rift with the past.

Fig. 15a
An image of the village of Quota during photo modeling of images from Drone processed within the Software 3DFZephyr.

Fig. 16
The remains of the high medieval walls of the Quota Castle in the Borgo della Piazzola In a elaboration of the Points cloud.


Modalità aereo disattivata



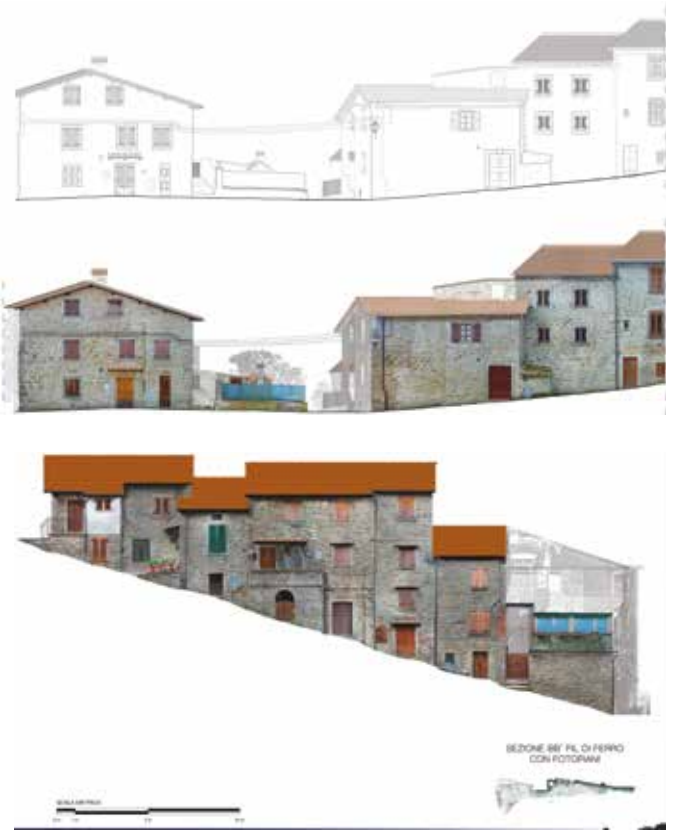
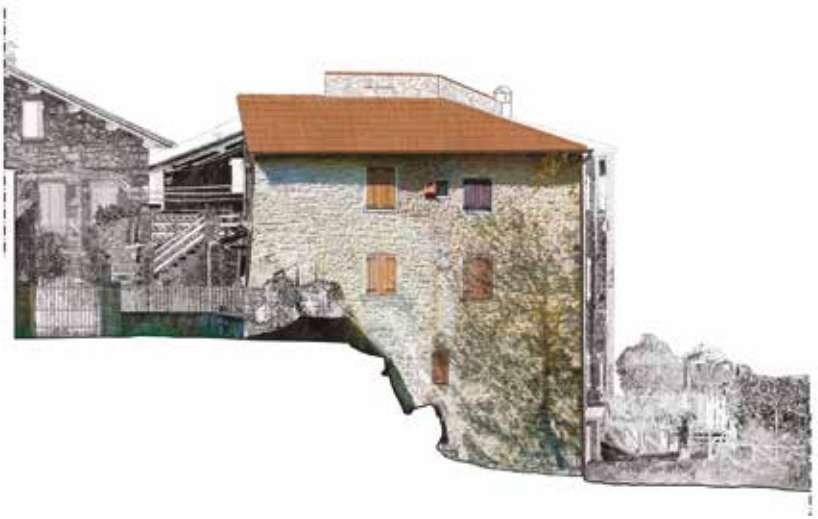


Fig. 17
The fronts of the "Tower" and the beginning of the Borgo del Lastro.

Fig. 18
The fronts of the Borgo Crudele.

Fig. 19
The Church square looking towards the street of the same name.

Fig. 20
The fronts of the "Tower" and the beginning of the Borgo del Lastro.



Since the early 2000s, this cycle seems to have ended its propulsive capacity and the villages have been subject to a gradual and inexorable depopulation. Those who were young in the fifties have aged and their generation is gradually beginning to disappear. However, their children's generation has not yet reached retirement age, and in any case the downward trend caused by the great economic crisis of 2007-2011 has impoverished them considerably, while their ties with their parents' places of origin has also weakened. As a result of these circumstances, we are once again in the presence of a dangerous demographic decline in our mountain villages. It is a much more dangerous phenomenon than that which occurred sixty years ago, because it is not a question of a section of the population moving away, but of a population disappearing and not being replaced, either by new generations, or by the return of those who had left, as happened with the exodus of the 20th century.

With the depopulation of the old town centres and the opening of large shopping centres in the valley, even the small shopkeepers have gone into recession and had to close their businesses. The closure of small businesses in the villages has further encouraged their abandonment. The persistence of these conditions can only have an unfavourable impact on the preservation of the territory of the Apennine valleys and in particular of that historical, architectural, cultural and landscape heritage which resides there. Not to mention that the depopulation and abandonment of mountain villages coincides with the cessation of any land management, an event that can cause degenerative phenomena from a hydro-geological point of view, in turn leading to changes that affect the phenomena of pluvial regimentation downstream.

Fig. 21
The small building built for the recovery of the site of the Fonte del Lastro and Seccatoio di Pilade.

It is therefore clear how important it is to be able to implement actions to counter the depopulation phenomenon of these villages, trying to induce virtuous actions that can slow down the depopulation of mountain villages, where not actively encouraging repopulation, especially of residents dedicated to caring for the territory itself.
Some hope for this trend seems to come from the effects produced by the Covid-19 pandemic raging since the beginning of 2020. In fact, the need to establish greater social distancing, and the possibility of smart working further enhanced by the project of the Tuscan Region to bring the fibre network to all small villages, may allow Quota and other mountain villages to hope for an albeit partial repopulation.
As far as the village of Quota is concerned, a certain reawakening of the real estate sector, practically dead for years, has been noticed in recent months. In this regard, it should be noted that for some years, voluntary associations devoted to preserving the village, are approaching their work with a renewed mentality and determination (Busi, 2020) Studies of Florence, and have begun to hold study seminars directly in the village. During these seminars, in addition to the survey of the entire village, projects for the enhancement of the village have been implemented. It has been acknowledged that the asset that distinguishes Quota, even compared to other Casentino villages, is the particular quality of the

water with special organoleptic properties that flows from the village fountains. In fact, during the twentieth century there were seven "Fountains" in operation, one of which, located just outside the village, "the King's fountain", is said to have had the best water. Many of the fountains were fed by single small aqueducts that led the water from the spring to the point of withdrawal, which was often equipped with a small tank. In 1969, thanks to the enthusiasm, the spirit of initiative and the good will of some people from Quota, first and foremost Lamberto Ciabattini, Angelo Giovannini and Abramo Fortunati Rossi, Quota was provided with its own aqueduct which, by exploiting some springs present "on the mountain", allowed the villagers to have running water in their houses. This "rural aqueduct" maintained and updated with some improvement works, is still operative and represents a richness for the village both for the quality of its water and because it is still owned by the villagers, who through an association allow all those who are connected to the aqueduct to participate with equal shares and property rights. DiDA research contributed to this work and its maintenance, by redesigning an old rural building adjacent to one of the village fountains (Pancani Ricci, 2020). The redevelopment project (Fig. 21) was financed by the Poppi Municipal Administration and carried out in 2019. Lastly, the presence of a nearby shop has helped to cement the spirit of local aggregation, which even in a period of crisis for mountain villages, as existed up to just before the pandemic, has allowed the small village to maintain a modest continuity of population throughout the year, with peaks of three to four hundred inhabitants during the summer holidays.

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THE VILLAGE OF STRUMI NEAR POPPI, IN SEARCH OF THE REMAINS OF THE ANCIENT ABBEY OF SAN FEDELE

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The village of Strumi seen from the road that comes from Poppi.

The village of Strumi is located near Poppi, in Tuscany, on the northern border of the province of Arezzo, in Casentino. It was founded by the Counts Guidi, who were also decisive in the growth of the medieval village of Poppi, where, in the 12th century, they built the imposing palace-castle on the top of the hill in a highly strategic position for the control of the valley. The Guidi, who were already present in the area around Poppi in the 10th century, built their first castle on a hill in the location of Strumi, above the small village where the ancient Abbey of San Fedele a Strumi stood and whose remains are present in the hamlet of the same name. The abbey, which initially adopted the rule of the Cluniacs, passed from the end of the 11th century to the rule of the Vallombrosans. Strumi was a religious center of reference until the 12th century when the Guidi family, who were its protectors, decided to move it inside the building of Poppi. In 2011-2012 with a laser scanner survey it was obtained a conspicuous amount of data regarding the morphology of the site, especially on the exterior and to a lesser extent on the interior, particularly in the church and in the ex-apse area. With the latest research started in 2019, the data already acquired were implemented with a new survey project, carried out using 3D photomodeling. The new data enhances the many information related to the morphology of the site, however, it was chosen to integrate it with SfM techniques, by making photogrammetric surveys both terrestrial and aerial.

Keywords: Casentino, monastery, documentation, valorization, recovery

Overview

Reaching Strumi can be complicated; not because there are physical obstacles or problems with the road surface, however, even though it is only a few kilometers from the village of Poppi, arriving at Strumi is difficult because it is not marked. During the journey from Poppi, the road varies more than once, the route also crosses a small settlement, we travel relying on our intuition but above all on our navigator because there are no instructions. We realize that we have reached the small village only when, at a crossroads, in front of a stone wall, an expert traveler, who knows how to look for signs, is able to identify them placed almost at ground level, on a rectangular sign smaller than the others, we read the name Strumi. This singularity expresses very well the essence of this settlement.A village that can be found only in two ways: either you know its exact location, or you meet it by chance along the way (Fig. 1).

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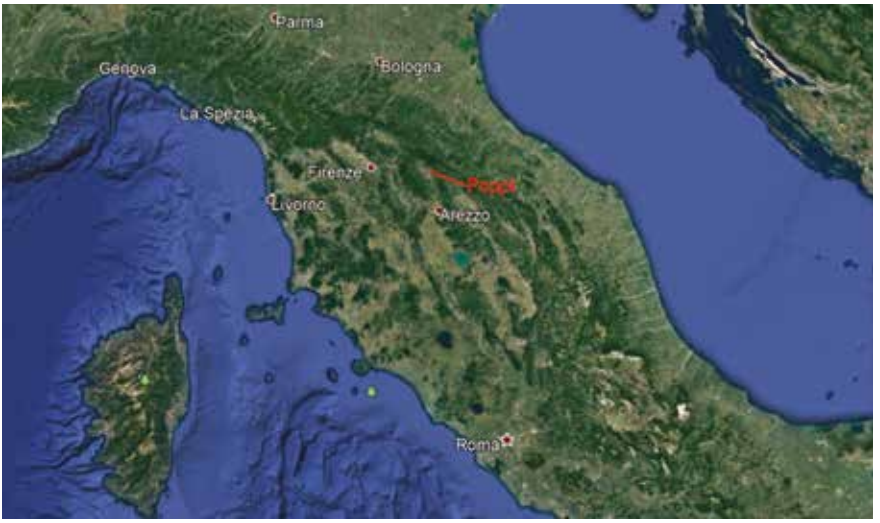

Fig. 2
Map of central Italy (Google Earth).

The hill on which Strumi rises is located in Casentino at about 2 kilometers, in a northwest direction, from the city of Poppi (Fig. 2). The hillock is surrounded on three sides by the plain of the valley bottom of the high Casentino, at the confluence of the Rovella ditch with the Arno river, just on the opposite side of the plain of Campaldino, known for the celebrated battle of 1289 (Fig. 3). The valley of Casentino represents the hydrographic basin from which the Arno river originates and crosses it from North to South, dividing the Apennine crests of Mount Falterona and Mount Penna de la Verna, from the massif of Pratomagno. The lands around Strumi are cultivated fields alternated to sporadic wooded areas; the settlement is developed along the low ridge of the hill and it can be reached by crossing a slope that from the west enters, going up, the heart of the built-up area. The area is very probably very different from what it was at the time of the first building. In fact the stream of the river Arno probably did not flow in the exact point where today it flows, and the area around strumi was probably swampy.

Fig. 3
map of the northern Casentino where the route and the distance between Poppi and Strumi are marked (Google Earth).

History

Strumi, as already mentioned, is located near Poppi, in Tuscany, in the northern side of the province of Arezzo, in the middle of the Casentino valley which has been an important transit way since the transhumance of prehistory (Fedeli, 1995). It is believed that, on a hill near the present village, was located the first Casentino castle built by the Counts Guidi; some excavations conducted by Riccardo Bargiacchi suggest that it was

located a little further upstream than the area now covered by the town, just on top of the hillock overlooking the village built on the ruins of the ancient abbey of San Fedele a Strumi (Bargiacchi, 2015); as it is also visible in the aerial photogrammetric image, from a flight in 1954, where you can clearly see the traces of the castle on the top of the wood north-west of the village (Fig.4). It must be considered, however, that the comital family of the Guidi, who during the Middle Ages exercised dominion and hegemony over the upper Casentino, built, only later, the castle and the walled village of Poppi on the site of a previous settlement present since Etruscan times, as demonstrated by the findings in the early 2000s (Bargiacchi, 2008). The walled city was built at the foot of the Castle-Palace that, thanks to its position, guaranteed the strategic control over the valley; in fact, it represented since its foundation and for all the Middle Ages the barycenter of the Guidi's power system in Casentino. The first document in which the name of Strumi appears dates back to the tenth century, it is a donation to the monastery in 992 made by the Countess Gisla, wife of Tegrimo II, in turn son of the founder of the House of Guido I (Rauty, 2003). The documents found date the first settlement of the Guidi in the area between 982 and 992. However, a few decades earlier, in 960, a certificate conferred on Guido I confirms the presence of the family in Casentino (Bicchierai 2005). Subsequent documents, but one in particular[1], inform us that the

[1] Rauty N., ivi, doc. 21 "[...] Vuido comes, fili o bone memorie Tegrimi qui fuit comes, quia pro Dei timore et remedium anime mee et remedium anime genitore et genitrice mei [...] in ecclesia Sancti Fi-deli, que est posita in loco qui dicitur Strumi, que pertinentt de monastero meo Sancti fideli, quod est constructo super fluvio Arno, in poio qui est iusta castello meo quod dicitur Strumi [...] illo monasterio meo Sancti Fidelis, quod est prope illo castello de Strumi[...].

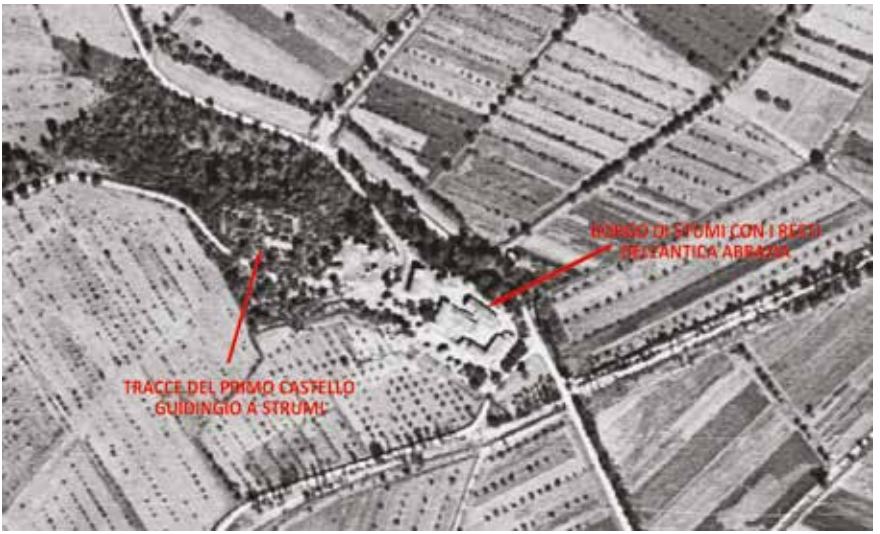

Fig. 4
Aerial photo, flight of 1954, on the hill you can see a lack of trees corresponding to the traces of the remains of the first castle of the Counts Guidi in the valley of Casentino.

Fig. 5
Picture of the remains of the apsidal area of the ancient church, today reduced to a dwelling, on the right of the picture you can see the remains of the basement of the ancient bell tower.

monastery in question had been founded by Teregrimo II, and that in 1029, as part of a donation of various territories and their tithes made by Count Guido II to the monastery, there was a castle, or the first of the Counts Guidi in Casentino. Of the mentioned castle there are unfortunately very few traces,just the position, in an oak grove on the hill present upstream of the current village,and some remains of worked stones and fragments of pottery. With the end of the XI century the destiny of the castle and of the monastery of Strumi is also outlined, in fact, in 1085 the abbot Placido and the Count Guido Guerra start the construction of the new Abbey of San Fedele, probably realized because the Guidi Counts wanted to have its own religious center inside the walls under construction of the Borgo di Poppi (Pasetto, 1992). In 1089, for the will of the monks themselves, the monastery passed from the Clunyacensis rule to the Vallombrosan one (Pasetto, 1992). The event that determined the definitive decline of the monastery of San Fedele a Strumi in favor of the new settlement of San Fedele a Poppi dates back to the 12th century, when in 1161, it found itself at the center of the quarrel between papal and imperial power. In fact, the abbot of Strumi Giovanni Ungari was appointed Antipope by the emperor Frederick Barbarossa, with whom the Guidi had a good relationship, also thanks to the support of the Vallombrosian congregation (Corsi, 1987), in his dispute with Pope Alexander III.Once resolved the issue between the contenders, Giovanni Ungari was deposed from his office and reintegrated in the ranks of the church, with the appointment

as Archbishop of Benevento. The 1169 is the year in which the presence of a castle in Poppi[2] is attested, a sign that the Counts Guidi had completed their transfer on the hill a few kilometers south of Strumi. Shortly afterwards, in fact, the construction of the city walls was completed, in 1262, the monks moved definitively to their new seat, leaving Strumi forever. After the transfer of the monks to Poppi, the abbey went through a period of substantial abandonment; the first information we know of dates back to the 18th century: in fact, there is a plate dated 1716 on the apse of the church, and the date 1719 is engraved on the architrave of the door of the chapel. These dates indicate restoration works carried out in the buildings of the village, especially the transformation of the back part of the church into a farmhouse. The abbot of Bibbiena Catanzi justifies these interventions as necessary to protect the health of the farmers who worked the fields around Strumi. The image of the old abbey church can still be found with the apse emerging among the forms of the farmhouse in the center of the village (Fig. 5) while on the right in the image you can see the remains of the bell tower.

[2] Bargiacchi R., I castelli dei conti Guidi in Casentino. For the reconstruction of an archeological landscape (secoli XI/XIII), degree thesis at the Faculty of Letters and Philosophy of the University of Florence, supervisor prof. Guido Vannini, Firenze, a.a. 2002-2003
and the writings of Alberto Fatucchi, in particular Fatucchi A., Le strade romane del casentino, in Atti e memorie dell'Accademia Petrarca, Nuova serie, Voi. XL, Anni 1970-72, Arezzo, 1974.

Fig. 6
Aerial photograph of the hamlet of Strumi.

Fig. 7
View of the point cloud derived from the 2011-2012 laser survey.

Research

The present research that has been conducted on the village of Strumi has been aimed at the implementation of the data already acquired in December 2011 and August 2012 through a laser scanner survey project (Pancani - Tocchi, 2012). The above-mentioned survey was already able to guarantee a good amount of data related to the morphology of the territory and the buildings. The choice was to integrate it with techniques of structure from motion, through the combined use of aerial aerea (Fig. 6) and terrestrial photogrammetry. The models obtained allow to implement the quality and quantity of data obtained from the previous survey, and allow to produce detailed thematic maps on the conformation of the walls, on their state of degradation and stratigraphy. The purpose of the survey is to obtain a new data bank related to the most qualitative aspects of the village, in order to verify and identify with more precision what emerges from the historical documents, and to propose and support eventual campaigns of valorization of the village itself. In fact, it is believed that Strumi has a potential and significant value for the tourist vocation in the Casentino area, both for its location and for its historical relevance.

Metodology

The previous survey carried out in Strumi in December 2011 was performed using 3D laser scanner technology, using a laser with "phase difference" technology, which guaranteed excellent performance at the qualitative level despite not requiring a particularly long time to make the individual scans, a rather high performance technology especially in light of the years in which it was used. At the same time as the above-mentioned survey, a topographic survey was also carried out, which allowed the measurement of targets, appropriately arranged to be acquired with both survey techniques, in order to constitute the reference frame for an accurate recording of the scans (Pancani, 2017). The product of this work is quantified in several dozens of scans and in their registration that allowed us to obtain a dense cloud of points of the entire town (Fig. 7). Starting from a fundamentally already complete and reliable survey from the point of view of measurements and morphology of the settlement, we chose to support it with Structure from Motion (SfM) techniques(Häming and Peters, 2010), used both from the ground and from drone, so as to integrate it with information related to materials and degradation present in the buildings. We have chosen to rely on a succession procedure, taking shots from the ground moving parallel to the buildings; the basis of the procedure consists in taking photographs in succession, bearing in mind the need for a clear overlap in the framing between one shot and its preceding one. The technique allows to perform an almost total mapping of the walls, although it is more effective on the portions

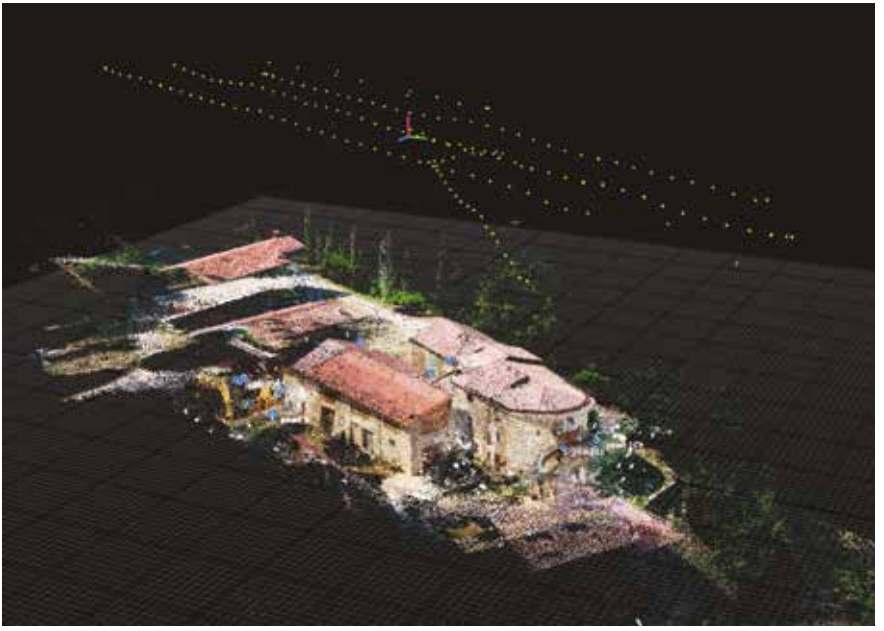

Fig. 8
image of the point cloud of the model obtained by the aerial survey in which the points of shooting of the images are signed.

Fig. 9
Particular of the aerial orthophotoplane of the village of Strumi, taken from the 3DF Zephyr® software, in which the point cloud of the laser scanner survey, used for calibration and dimensional verification, has been used together with the point cloud derived from the 3D photomodelling with SfM techniques of the aerial survey performed by drone.

of the object less in foreshortening compared to the point of view of the photographer, or those that the photographer can frame without tilting the angle that connects the camera to the 'framed area (Gaiani, 2015). The photos taken have been processed with a 3D photomodeling program, in this case the 3DF Zephyr® software (Fig. 8). The procedure, provides that through the recognition of the shooting position of the images used, it is possible to reconstruct, at first, a "sparse" point cloud model, through which it is possible to correctly align the images, to proceed with the realization of a point cloud much denser and richer in information, from which it is obtained a polygonal mesh surface, which can be considered in all respects a 3D model. On the surfaces of the obtained model, always strictly correlated with the images used for its realization, the texture of the framed subject is processed, which is directly derived from the pixels of the photographs. This technology, not only allows us to increase the information useful to formulate and represent the diagnostic aspects of the asset, but also allows us to operate at a graphic level with great precision of representation even at more accurate scales (Pancani, Ricci, 2020). The modern techniques of Structure from Motion, make possible the integration between the three-dimensional model reconstructed through photogrammetry and the cloud of points obtained from a laser scanner. The terrestrial photogrammetric

survey was carried out with the aid of two reflex cameras, maintaining a constant focal length of 24mm. This expedient is fundamental to keep constant the size of the area we are framing and the quantity and quality of the details photographed, provided that we move around the object remaining at a distance as fixed as possible (Bigongiari, 2019). The above acquisition methodologies, accompanied by the tricks described above have proven useful for a correct alignment of the photos, which unfortunately, often falls victim to small imperfections and misalignments in the detail. In the case of Strumi the problems are derived from a particular disposition of the various buildings and vegetation that has made complicated the photographic acquisition: in particular, during the photogrammetric acquisition it has been fundamental that the single fronts did not present shadows with excessive contrast, because they tend to make very complicated the alignment of the photos, however also in the texture they create problems of dissimilarity of colors, if not even of shapes. Other relevant issues have arisen in the next phase, at the time of integration with aerial photogrammetry.

Specifically, the techniques of aerial photogrammetry were used with a drone capable of producing good quality images, acquired on a preset grid while maintaining a constant distance from the ground and following precise lines previously prepared by the operator. In this case have been of particular help, the absence of significant foliage in conjunction with

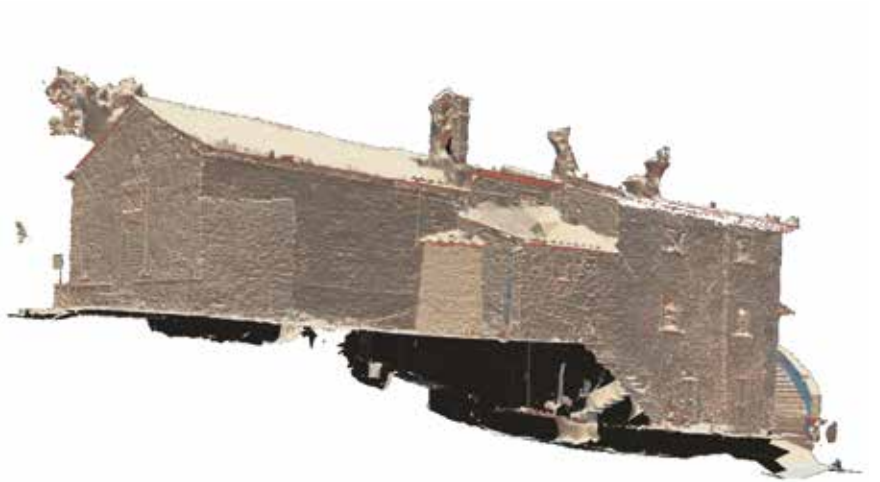

Fig. 10
image of the point cloud of the model obtained by the aerial survey in which the points of shooting of the images are signed.

the roofs of the buildings and their substantially homogeneous height (Fig. 9), aerial images have allowed an effective reconstruction free of imperfections due to a mixture of light and shadow areas. Given the large amount of total photographs chosen for the reconstruction, a photogrammetry software suitable for the management of large amounts of information was used. The procedure was divided into several phases: the first was the insertion of all the ground photos in the software, followed by the alignment necessary to generate the point cloud and the 3D model of the images acquired from the ground. The same thing was done with the set of aerial photos. Finally, the two different point clouds were unified, using control points also called homologous points. In other words, clearly recognizable and identifiable points present in both the ground and aerial photo sets were chosen. By inserting targets in at least three of these points, through the photographs, the two point clouds were linked into one. On the product of this union, a mesh model was elaborated and then textured (Fig. 10), thus realizing the total photogrammetric model of the small village in question, which was appropriately scaled, compared and verified with the data of the point cloud of the laser scanner survey.

Conclusions

The 3D textured model obtained with the present work allows us to compare the results obtained with those of the previous survey. Moreover, the sections and the plans

obtained thanks to the management of the Point Cloud can be in turn texturized in order to perform investigations on the walls and floors (Fig.11, 12 13). In the field of restoration and conservation, the photogrammetric survey can provide us with fundamental preliminary information, especially with regard to diagnostics. Especially when the data of the photomodelling are interconnected with the data coming from the laser scanner survey. The reading of the models produced in the survey campaigns, laser scanning and photogrammetric, can be important for the management of this small settlement, and of all the small villages with similar attributes. The past, but also the relatively recent history of Strumi confirms how the functions and the conditions of use of this settlement have deeply changed during the centuries, and how at the same time its aspect and its building configuration have also varied. However, the issues related to the massive abandonment that followed the second post-war period of the twentieth century bring us once again to the problem of conservation and revitalization of these settlements. Finally, it is interesting to note how the pandemic still in progress has further shuffled the cards at stake, raising some questions about a possible reversal of the destination to Holiday House and Residence that had outlined the intended use of the village in recent years.

Fig. 11
Cross section of the hamlet of Strumi, resulting from the digitization of the laser scanner survey, enriched by photogrammetric images. From the section it is very clear the hilly relief, on which the site stands, compared to the surrounding alluvial plain.

Fig. 12
Cross section of the hamlet of Strumi, resulting from the digitization of the laser scanner survey, enriched by photogrammetric images. From the section it is very clear the hilly relief, on which the site stands, compared to the surrounding alluvial plain.

Fig. 13
Longitudinal section of the village of Strumi, executed to highlight the rapport between the agricultural buildings and the house that arises on the remains of what was presumably the cloister of the old abbey.

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CASTEL FOCOGNANO, SURVEY AND DOCUMENTATION OF A CENTRAL APENNINE BOROUGH WHICH HAS FALLEN FROM THE PROVINCIAL CAPITAL TO A PERIPHERAL HAMLET, NOW AT RISK OF ABANDONMENT

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Portion of wall facing in which there is the original style of the joints between the ashlars.

The Municipality of Castel San Focognano is located in Tuscany in the province of Arezzo. The first historical memory dates back to 1028, the castle stood in the middle of three ditches , above a precipitous eastern buttress of Pratomagnowirew and was surrounded by a double circle of walls. The Giannellini family maintained its possession until 1322 when it was conquered, after six months of siege, by the bishop of Arezzo Guido Tarlati. In 2012 the borough was to an accurate laser scanner survey, with this methodology a protocol for returning the works was conducted in order to obtain a detailed repertoire on the facades and floors of the village. The development of this path on the representation of the village was centered on the certification of the point clouds of the laser scanner survey. The laser scanner survey was accompanied by an accurate 2D photogrammetric survey, recalibrated on the projections of the facades of the point clouds, thanks to which it was possible to make the photoplanes of most of the fronts of the village. The study made it possible to create a database on the state of conservation of the small Casentino village, particularly accurate thematic maps were made on which a study was carried out on the degradation of the facades but also on the state of conservation of some parts of the pavement, in particular of those areas where the original stone pavement is still present. Ultimately this work allowed the establishment of a wealth of information and analysis on the state of conservation of this mountain village, which, however, is still in good condition, because of the depopulation that affects this type of settlement, it risks, before remaining uninhabited and then disappear forever.

Keywords: Casentino, medieval village, Survey, documentation, enhancement, recovery

Introduction and historical notes

Castel Focognano is located in Tuscany in the province of Arezzo. The Municipality of Castel Focognano occupies the eastern slope of the Pratomagno up to the Arno Valley, at the southern end of the Casentino (Fig. 1). The first historical record on Castel Focognano dates back to the 11th century but its territory has certainly been inhabited since the earliest times. The Etruscan presence is attested by the discovery in Pieve a Socana, behind the apse of the Romanesque church (Caselli G. 2003), of a large altar dating back to the 5th century BC. together with the remains of the access stairway to an ancient temple, with fragments of pottery or black paint, artefacts from the 5th century BC. and stone blocks bearing Etruscan engravings. Socana was probably the intersection of main roads that connected the Casentino with the Valdarno and, across the Major, with the regions of northern Italy (Nassini C.,

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Fig. 1
Map of Tuscany, with identified the province of Arezzo, the valley of Casentino and the territory of Castel Focognano.

Fig. 2
The remains of the hexagonal tower (severed) to defend the access road to Castel Fognano.

Martinelli M. 2002). There are also traces of the Roman period, whilst the emergence of the first settlements perched on the peaks dates back to the 5th and 6th centuries AD when the populations were forced by the barbarian invasions to abandon the valley to seek refuge in the more easily defensible mountain areas (Caselli G. 2003). The first historical record of Castel Focognano dates back to 1028 (Pironci Branciaroli A. 2008): the castle stood "in the middle of three ravines, above a steep eastern buttress of Pratomagno" and was surrounded by a double circle of walls. It remained in the Giannellini family's possession until 1322 when it was conquered, after a six month siege, by the bishop of Arezzo Guido Tarlati. It then passed to the Ubertini and, from 1404, to the republic of Florence. The Potestà resided in Castel Focognano until 1778, when the Grand Duke Pietro Leopoldo ordered the administrative headquarters to be transferred to Rassina (Prezzolini P. 1859). From the end of the Middle Ages, as defense requirements were declined, the village of Rassina acquired increasing autonomy and its position at the confluence of the Arno and its self-named river was instrumental in its development. Rassina becomes (Taddei D. 1995), in the following centuries, one of the most important

manufacturing centers in the area: for the manufacture of woolen cloths, the weaving of linen and hemp, and silk processing. By the end of the nineteenth century the town had already assumed the appearance of a small artisan-industrial center which it still retains today. Rassina is currently a ively thriving l town, with its economy centered predominantly around industrial, artisanal and commercial activities. The territory of the Municipality also includes the centers of Salutio, once the famous castle, homeland of the Tarlati and Carda (Nassini C., Martinelli M. 2002). Continuing further along this second route Carda offers an excellent view, clearly showing its conformation with the church situated at the highest point. At first glance it seems the village nestles on the mountain slopes, whereas it is in fact located on the top of a small hill. Originally Carda, mentioned as Garda in ancient documents, was certainly a small fortified settlement, probably of Lombard origin (Pironci Branciaroli A. 2008) in the upper part of the town. The church was much smaller than the present one, and with development this, too, had necessarily to undergo expansion. The structures of the village buildings are analyzed and investigated for their stylistic aspect and architectural quality: a walled-up part is the result of a sequence of constructive and destructive actions, actions that can be the work of man or caused by natural events. There are numerous factors that have influenced the differences between construction techniques. The initial classifications are expanded. The first repertoires are developed: masonry typologies distinguished by technique and their historical period (Caselli G. 2003). We can see the differences in the walls built by common workers, such as the ashlars that make up the "severed" tower and the defense walls (Fig. 2). Skilled specialists worked on the facades of the buildings overlooking the square using more or less costly construction techniques. The stone blocks are mounted a few at a time, arranged in rows or coursed . This allowed the mortar to harden. The mortar was prepared directly "on site" and was obtained by mixing lime with other thinning substances: usually crushed stone, pozzolans, sand or earth. The quantity of blocks that could be assembled all together depended on the strength of the mortar, the type of material, the skill of the mason. The ashlars, which can sometimes also consist of several USMs, are recognizable in the masonry and represent a construction phase. The skill of stonecutters is evident in the workmanship on the stone elements that reveal signs of the tools used. They shaped the block with a right-angle square to create perfectly perpendicular surfaces, and with a chisel sculpted, with the help of tape, the contours bands of the squared ashlars cornerstones (Fig. 3). Subsequently, with another tool, the central part of the ashlars was summarily adjusted, or leveled, a more precise process. The castle is the expression of power over the "micro territory", and is built with techniques and materials appertaining to specialized workers traveling in the territories. Rustication seems to characterize all the castles of the Guidi in Casentino

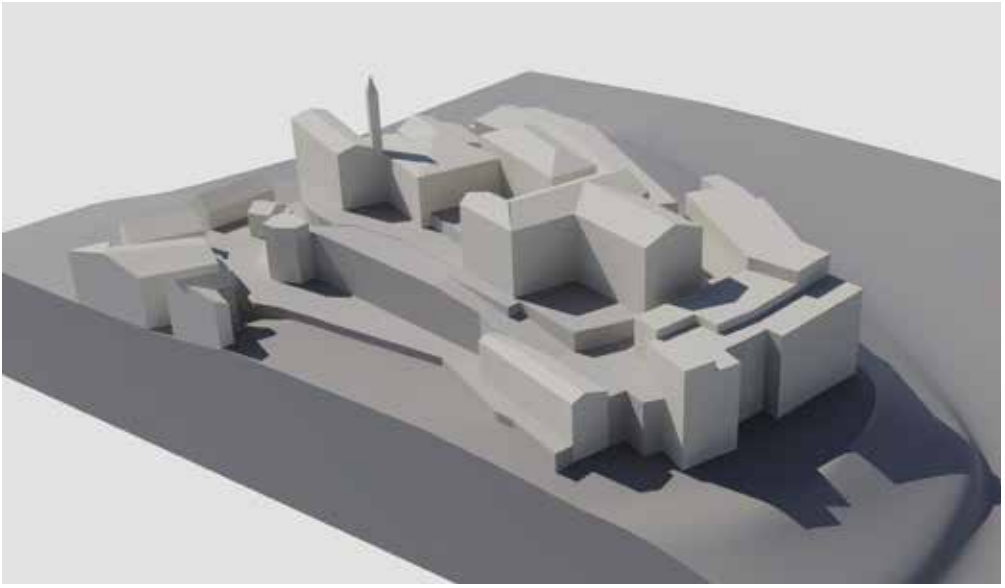
Fig. 3
Wall facing of a tower of the town walls in which there are some examples of finishing of the ashlars.

and Pratomagno between the 12th and 13th centuries. Castel Focognano is located on a hill the height of which was accentuated by anthropic intervention to improve its defense, and its plan divides into a polygonal keep, reminiscent of the Frederick dungeons in northern Italy, with the inhabited lower part closed off by a long external wall. The same topographical organization of the site was found in the nearby castles. From the post-Lombard period to the mid-fourteenth century, the area would be under the jurisdiction of Arezzo.

Fig. 4
3D model of the village of Castel Focognano.

Methodology

This study of the historic village of Castel Focognano began in 2012, a result of the arrangement between the above-named municipality and the Department of Architecture of the University of Florence (DIDA). This survey was carried out to set up a metric morphological information bank and to establish a database on the inhabited area of the ancient village. We are witnessing what has been happening for several years now:- a progressive abandonment of the historic centers in the mountain villages of the upper Casentino, a phenomenon which also concerns the other high-altitude villages in the entire municipal area. For this reason, the municipal administration decided to undertake a series of studies on the other villages in the area too. The survey of the small



historical centers is necessary to photograph a status quò, from which to begin further research to seek solutions aimed at enhancing and conserving the area (Fig. 4).
At the same time, the survey allows us to 'freeze' a given moment, not only with snapshots that can capture the landscape and even its hidden aspects, but also with precise morphological data and measurements that allow us to evaluate the true consistency and historical characteristics as well as the construction of the buildings examined.
The finishing on the wall joints consists of a thin groove engraved on the mortar beds (at the base or in the middle) using the trowel edge or a stylus (thin pointed tool or listel that gives its name to the workmanship), following a correctly aligned ruler. Styling was performed both after the removal of the excess mortar reflux from the joints, and after topping up the joints themselves with a small amount of glue by mixing putty-based plaster and mineral mixtures. In some parts of the surfaces there is also smoothing (flat, slide or concave) which, after topping up, involved aligning the joints flush with the outer surface of the ashlars (Fig. 5).
Stylature then was resumed in medieval times, in the 11th century (with the circulation of more skilled workers on the construction sites), and is found applied to stone embellishment, with rare examples, too, discovered on the vertical joints. There are examples of curtain walls with styled joints on both facades destined to remain visible and on walls subsequently covered with plaster; in this case the said indentures were traced to facilitate the

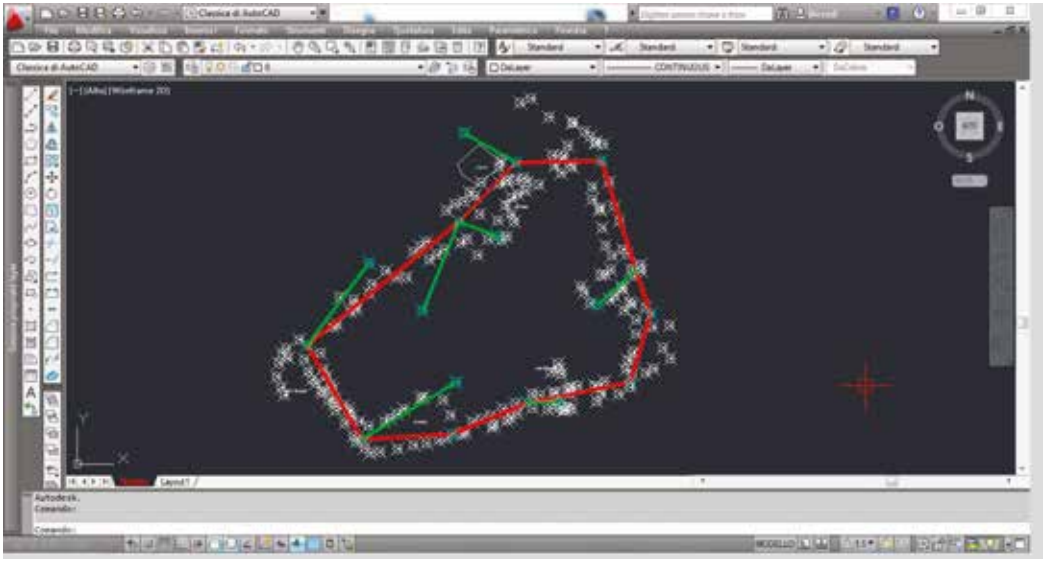


Fig. 6
Image of the polygonal made with the topographic survey to verify the correct recording of the cloud of points.

coating layers. Styling is a fundamental part in the realization of the curtain walls (a solution frequently adopted between the 11th and 13th centuries), a technique where a facing was designed on any type of masonry (from the roughest to the highest quality) very similar to a furled curtain (characterized by very thin joints); the masonry is co vered with a thin layer of plaster where the brick courses were painted in bright red and the false joints traced with the stylus without any correspondence with the real joints of the masonry behind. The stylization is flush with the ashlars' surfaces which together make up the homogeneous side of a facade. Abundant is the mortar used for ashlars joints.

The ancient construction techniques are revealed in the main elevations of the buildings in the center of the village[1]. The quoins of the buildings are mainly made up of larger well-hewn squared ashlars to accentuate their architectural characteristics. Walls with small ashlars of *pietraforte* appear posed in isodomic and pseudo-isodomal rows or with ashlars, rusticated or otherwise, and always flawlessly from a technical point of view. These stones on the external surface are of different lengths but in each case the same height. They are squared roughly and without smoothing and are without plaster. The

Fig. 7
Image of the cloud of points recorded for the relief of the village of Castel Focognano.

[1] In the survey of the village of Castel Focognano are also reported the traditional techniques of construction of the buildings that still presold this type of construction, as reported in the thesis of Gianfilippo Valentini, *Survey of the historical village of Castel Focognano (AR), certification of the 3d laser scanner survey on the polygonal topography and assessment of the deformations on the facades*, Tesi di Laurea, Università degli studi di Firenze, A.A. 2015/2016, relatore Prof. Pancani G., corr. Minutoli G.

stone elements are all connected to each other with mortar made and mixed with sand or quarry sand. Analyzing the façades, it can be seen that the size of the ashlars in local stone in varying dimensions, are secured together according to their roughly hewed form , embellished with lime-based mortar.

The survey on the materials offers a sampling of stone elements of various kinds as well as pieces of different sizes. The 3D survey was mainly carried out in two seasons, one in 2012 and the other the following year. In 2012 a Faro Focus 3D instrument was used, with which the center of the village, the square, the church and the exteriors of what was once the praetorian palace were detected. The season the following year which was carried out with a Z+F 5010 tool concentrated on the marginal parts of the small village, including the portions of the walls still standing. To ensure the alignment and geo-referencing of the survey, in 2013 a topographic survey was used to create a closed polygon around the main route of the town and with 4 sides open to reach and connect the squares and internal points of the village (Fig. 6). Throughout the complete survey, the targets applied during the second 3D laser survey were measured, with an adequate number of verification points related to the laser

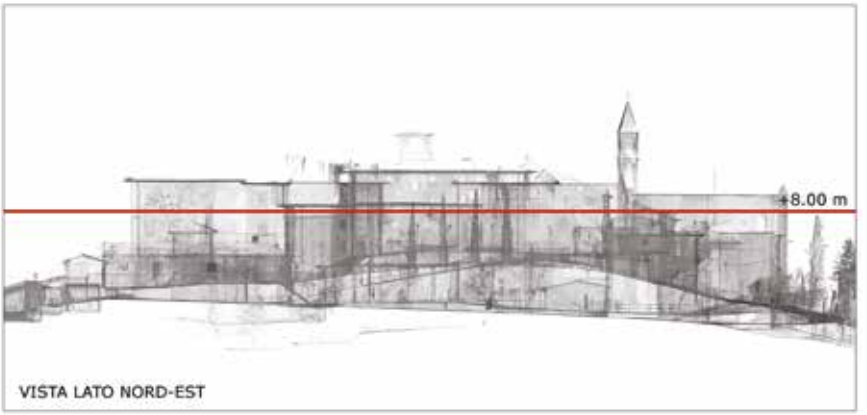


Fig. 8a
Testing of the point cloud, verification of the parameters of correct alignment of the various scans carried out on the horizontal plane, with control of the minimum acceptable tolerances on the distance between the various section wires.

Fig. 8b
Testing of the point cloud, verification of the parameters of correct alignment of the various scans carried out on the vertical plane, with control of the minimum acceptable tolerances on the distance between the various section wires.

scanner survey of the previous year. The entire project consists of over 117 scans and has generated a database of over 55Gb. Rigid roto-translation is the operation through which it is possible to combine all the scans performed for a survey into a single "cloud of points" (Fig. 7). The latter represents the file in which all the morphometric and qualitative information of the laser scanner survey are stored. By recording all the scans with the topographic survey, the complete point cloud is obtained.

The relevant surveys in question were carried out in 2012 and at that time there was still no talk of "Certification of a survey". For this reason, the in-depth analyzes useful for carrying out any advanced appraisal were neither planned nor consequently achieved, although the aim of the study was to provide satisfactory results using the appropriate tools and methodologies to draw up a reliable survey. To carry out a 100% effective test, in fact, it would have been necessary to have a second topographic survey, called "testing", performed on certain significant architectural points, which compared with the recorded point cloud would have verified the error. Unfortunately it was not possible to carry out this second check survey.

Observations on the conservation status

The masonry materials that make up the well-compacted walls are mainly posed keeping the original side for laying horizontal, which corresponds to the quarry bed. On the contrary, the stone lintels, to make them more fatigue-resistant, are mounted with the laying surface standing upright, vertical to the wall (Rodolico F. 1953). In the wall facades that are made of sandstone, typical degradation can be seen induced by the calcite veins that run close together through the stonework thus hindering substantial potential load strength (Rodolico F. 1953). Surface condensation has caused chemical-chromatic transformations of the surface of the segments leading to the formation of biological patina and stains.

The botanical risk is caused by weed vegetation: herbaceous perennial plants that grow profusely with either taproot root systems that are weak or robust. The precise presence of organic seedlings due to pollen dusts is negligible.

Fig. 9
Plan of the village of Castel Focognano, with digitization of the ashlars to the wire frame and deepening of the knowledge of some portions of the pavement through the realization of orthophotoplanes.

The presence of woody herb shrubs and bushes with medium to highly invasive root suckers with penetrating taproots affects the base of the walls and the tower where they proliferate between the ashlars joints. The paving stones present the same situation: sprawling roots have penetrated deeply, altering the layout of these paving stones. Un-channeled water is the main cause of degradation pathologies. The biological patinas are evident where there are signs of rising damp at a height imposed by Jurin's law. Stains, present in correspondence with the cornices and string courses of the facades of the buildings in the square due to the absence of water outlets, and incrustations alternate on all the surfaces of the facades. The architectural elements show pieces missing, and there is evidence of erosion caused by rainwater weathering the surfaces where *pietra serena* was found in use externally : an example is the deterioration of the capitals and the bases of the columns that form the portico. The same type of erosion is present in correspondence with the wall faces where there is no gutter system.

Final checks on survey techniques

In order to maintain rational supervision of the point cloud and optimize its management, a scan registration logic was drawn up. An initial empirical inspection was carried out on the wires of the sections operated on the point cloud. To be able to verify and check the point cloud (Pancani G. 2017) created in the partial recordings together with the one constructed in the final recording, the slyces made by the same section planes that were considered for the necessary summary checks carried out on the new cloud were also evaluated on the latter (Fig. 8a and 8b). The composition of the point cloud emerges correct and the survey is certified. The upright images supported by a.txt document were then interpreted, imported into AutoCad and vectorized obtaining the geometric masses and the wire frame (Fig. 9). Then the photoplanes were made with Archis and worked in PS followed by the materials and decay tables (Fig. 10). The elevation-maps with measurement of the deformations on the façade highlighted alterations in the laying surface of the elements. The slyces are set on Cyclone with a competent way of identifying the vertical projection planes.

Conclusions

From the survey it is possible to extract numerous facts relating to both material and quantitative as well as qualitative analysis, such as the Elevation Map (Fig. 11). This is part of the latter analyzes. The data collected give us the possibility to carry out different readings for further research into the study of the survey object in question. It is therefore possible to perform diagnostic analyzes that allow interaction with other disciplines. The elevations examined in the different environmental sections are the main ones in the historic center of Castel Focognano. Based on the analysis carried out using Elevation Mapping, we are in a position to affirm that only in the facades that project onto the street connecting the square to the church are there significant signs of deformation. Probably due to the numerous construction phases that have affected the entire village.

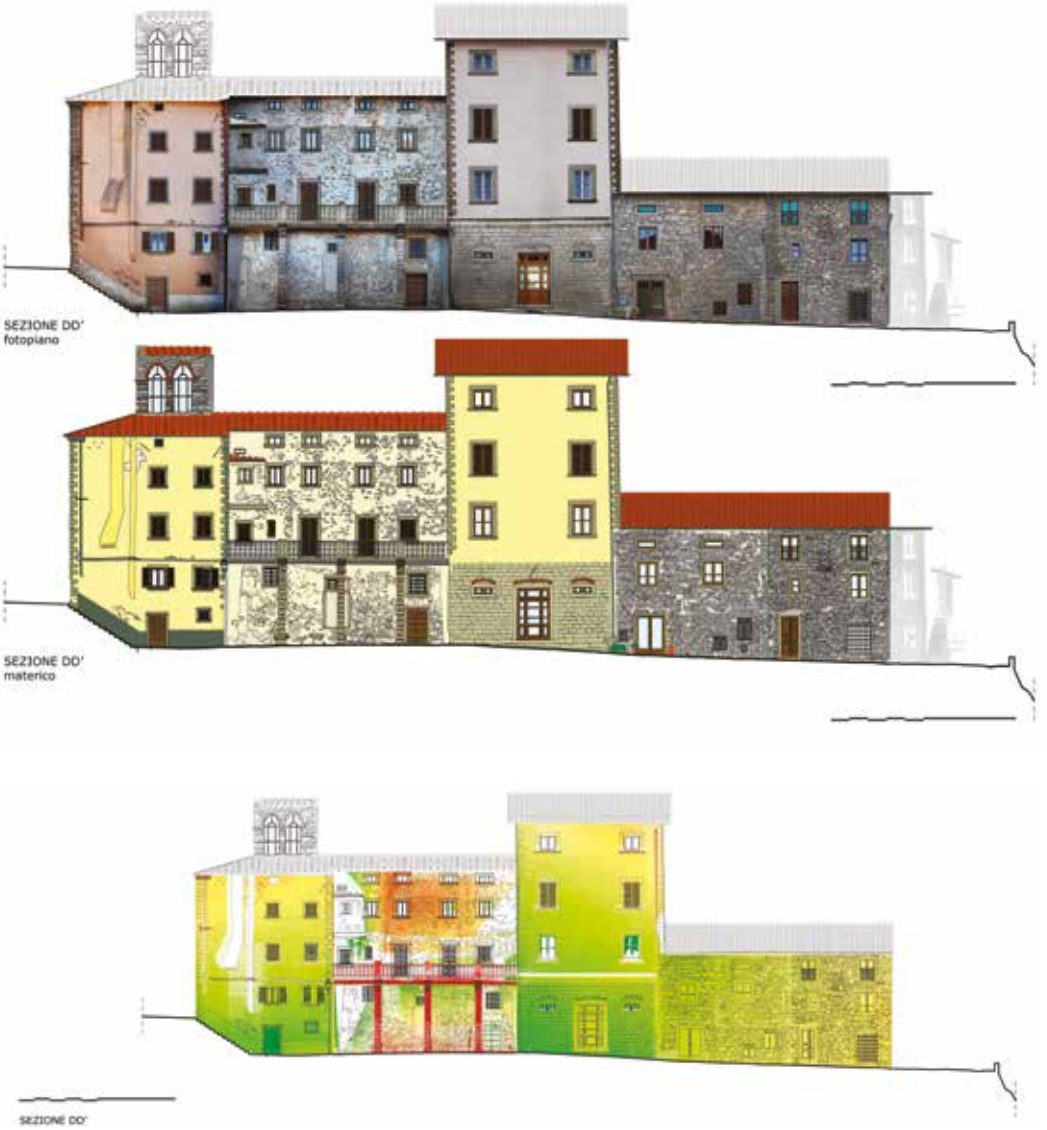


Fig. 10
Orthophotoplane of a road front with overlap of digitization to the wire frame.

Fig.11
Visualization of the displacements of the points with respect to a assigned parallel plane (Elavation-map), to evaluate the plastic deformation of the fronts.

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MULTILEVEL ANALYSIS FOR THE PROTECTION OF THE ARCHITECTURAL HERITAGE OF SMALL VILLAGES

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Vista di Raggiolo nel comune di Ortignano Raggiolo, Arezzo in Casentino.

The issue of conservation and recovery of built heritage has seen in recent years a growing interest in the scientific and cultural environment. Government institutions should implement programs for the regeneration, conservation and protection of the historical memory of places. The objective should be to encourage the development of the territory, especially in areas at risk of depopulation such as mountain areas. The regeneration of small villages, such as those of the Apennines, requires recovery plans that include the mitigation of the seismic risk affecting the territory. In the state of the art there are numerous studies dedicated to the assessment of seismic vulnerability and performance of the urban system, in general of all the components of the territory: infrastructures, urban centers, blocks or single buildings. Each single research evaluates specific and limited aspects and has only one dimension of investigation, on an urban or smaller scale. A multilevel analysis methodology is presented in this paper. The process studies the entire urban center and each component of the system, making organic and complete analyzes of the entire building stock with targeted and necessary insights.

Keywords: small villages, seismic vulnerability, recovery, conservation and regeneration.

Introduction

The Italian municipalities at risk of total abandonment are about three thousand. According to Legambiente, about 2381 of the centers at risk are already in an advanced state of abandonment and the rest show signs of depopulation (https://www.legambiente.it/). One of the country's negative records is having the highest ratio of abandoned to inhabited countries.
State investments are not made on the territory if there are continuous migratory flows and the absence of economic prospects and the consequence is the reduction of services and the abandonment of infrastructures.
The post-World War II economic boom caused abandonment to peak. The population emigrated from the countryside and mountain areas to the city in search of work and well-being.
The causes of abandonment are divided into natural and unnatural causes. Natural causes such as earthquakes, landslides or floods, and non-natural causes such as economic emigration, construction of public utility works, war events or declarations of impossibility of use.
ISTAT reports that about six thousand villages and small agglomerations are uninhabited or almost uninhabited due to earthquakes, floods, famines, plagues, lack of primary services

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Tab.1
Italy-Main areas subject to depopulation.

AREA SUBJECT TO DEPOPULATION	CAUSE
ASPROMONTE (CALABRIA)	• NATURAL CATASTROPHIC PHENOMENA SUCH AS EARTHQUAKE OR HYDROGEOLOGICAL INSTABILITY • EMIGRATION (ECONOMIC CAUSES) • ISOLATION
MOUNTAIN AREAS: • TUSCAN-EMILIAN APENNINES • LIGURIAN HINTERLAND • ABRUZZO HINTERLAND	EMIGRATION (ECONOMIC CAUSES)
BELICE (SICILY)	NATURAL PHENOMENA (EARTHQUAKE)
AGRICULTURAL VILLAGES (SICILY)	EMIGRATION (ECONOMIC CAUSES)
MINING VILLAGES (SARDINIA)	EMIGRATION (ECONOMIC CAUSES)

Tab.2
Apennines-Municipalities located in every seismic zone.

and above all due to lack of work (https://www.istat.it/). Almost all of them are inaccessible areas and subject to seismic, hydraulic or geological risk. The areas most affected by the phenomenon are shown in Tab. 1.

International sustainability-based territorial governance policies attribute a central role to natural risks. The Habitat II report [1] clearly expresses the union between risk mitigation and promotion of sustainable land use, disaster prevention and historical heritage recovery.

In Italy we have some experiences such as the recovery plans of small villages tested in Calabria. The region is characterized by a high presence of areas subject to depopulation for economic reasons, absence of infrastructures and natural phenomena such as seismic events and hydrogeological instability. In the early 2000s, local authorities promoted integrated recovery plans that combine conservation of historical heritage, mitigation of natural risks and economic and social revitalization [2]. Recently, the Italian government has addressed the issue of the depopulation of small villages, with the law of 6 October 2017 n. 158, known as Salva Borghi, completed with the implementing decree of 10 August 2020. The law provides measures for the support and enhancement of small municipalities up to 5,000 inhabitants, has the objective of countering depopulation, the constant aging of the resident population, the loss of public services, the impoverishment of economic activities and the growing isolation. In particular, Salva Borghi promotes

SEISMIC ZONE	MUNICIPALITIES PRESENT
ZONE 1-HIGH SEISMICITY, PGA OVER 0.25 g	MUNICIPALITIES
ZONE 2-MEDIUM SEISMICITY PGA BETWEEN 0.15 AND 0.25 g	2,345MUNICIPALITIES
ZONE 3-LOW SEISMICITY PGA BETWEEN 0.05 AND 0.15 g	1,560MUNICIPALITIES
ZONE 4-VERY LOW SEISMICITY PGA LESS THAN 0.05 g	3,488 MUNICIPALITIES

public and integrated public-private interventions aimed at the recovery, conservation and recovery of the building heritage by private individuals, the construction of public works or works of public interest, extraordinary maintenance and reuse of unused building heritage, statics and anti-seismic consolidation of historic buildings and improvement of urban services (http://www.anci.it/).

Historic villages at risk of depopulation and anti-seismic recovery plans

The Italian territory is affected by a strong seismic risk, 36% of the municipalities are in highly seismic areas (2.893 municipalities). The Apennine area has the highest seismicity [13] and is an area very subject to the phenomenon of depopulation mainly due to economic stagnation and the absence of infrastructures and services. The conservation and recovery of the building heritage in seismic areas to encourage the socio-economic recovery of historic villages at risk of abandonment must include a risk mitigation action. Today, all international territorial governance policies recognize the need to mitigate natural risks, this is the basis of policies for the promotion and sustainable recovery of urban settlements. (Fig.1). Tab.2.
An effective recovery plan for the entire urban centre requires an assessment of the structural performance in the event of an earthquake on the entire building stock. The knowledge of the seismic vulnerability of the buildings identifies specific and efficient safety measures. The Emilia Romagna Region was the first to understand the importance of urban planning aimed at risk mitigation. With RL 35/1984, the Region has supported the development of specific analyzes and detection methods for the reduction of seismic risk (https: //ambiente. regione. Emilia-romagna.it/). The law promoted recovery plans that identify urban planning and building intervention strategies useful to moderate the risk. All the proposed recovery initiatives started from the analysis of the seismic vulnerability of the urban system. The

Tab.3
Apennines-Municipalities located in every seismic zone.

GOAL		RECOVERY OF BUILDING HERITAGE AND MITIGATION OF NATURAL RISKS
ISSUES		OPTIMIZATION OF ECONOMIC AND TEMPORAL RESOURCES IMPOSSIBILITY OF IN-DEPTH STUDIES ON ALL THE BUILDING STOCK
PROPOSED SOLUTION	OPERATIONAL PHASES	1. ANALYSIS OF THE URBAN SYSTEM 2. CLASSIFICATION OF BUILDING HERITAGE ACCORDING TO PUBLIC UTILITY 3. DEFINITION OF A PRIORITY SCALE OF STUDY AND INTERVENTION 4. APPLICATION OF A MULTILEVEL SEISMIC VULNERABILITY SURVEY METHODOLOGY ACCORDING TO PRIORITY CLASSES 5. ANALYSIS OF THE RESULTS 6. DEFINITION OF RECOVERY PLANS AIMED AT THE MITIGATION OF SEISMIC RISK

Fig. 1
Seismogenic sources of strongest earthquakes (Mw 5.8 and higher). (DISS Working Group, 2015: http://diss.rm.ingv.it/diss/) (Catalogo dei Forti Terremoti in Italia, Guidoboni et al., 2007) [13.]

importance of studying the entire urban centre is the basis of the definition of the Minimum Urban Structure (SUM), developed after the 1997 Umbria earthquake (https://www.regione.umbria.it/). SUM is defined as the system of routes, spaces, urban functions and strategic buildings in the event of a seismic emergency, for the maintenance and resumption of ordinary urban, economic-social and relational activities after the seismic event. In conclusion, this is a subsystem considered essential on which to concentrate investigations and safety measures (https://www.regione.umbria.it/).

The analysis of the seismic vulnerability accompanies the recovery of the building heritage to combine the principles of conservation of the historical heritage with the dissemination of risk mitigation policies and a culture of safety. Due to the complexity of the building heritage of the villages and in general of the Italian historical centres, this work proposes a multilevel analysis procedure of the structural performance of the building. Tab.3.

(Fig.2). The various investigation phases described have a different level of knowledge, complexity of analysis and expected results. In conclusion, the steps have different uses and purposes, but with the right correlations they provide an organic and global assessment of the seismic vulnerability and possible damage expected for the entire urban centre.

A multilevel and multidisciplinary approach to knowledge

A multilevel investigation of seismic vulnerability is also based on three different steps of knowledge and has three degrees of reliability of the expected result. The urban-scale analysis is the first phase and can be based on data already available and only recovered. The subsequent phases, the study of an urban aggregate or of a single building require additions of varying complexity. The ancient villages have a simple architectural formality but really have a profound constructive complexity due to the numerous building transformations that have taken place over the centuries. In complex structures, a knowledge phase based on a multidisciplinary approach is required. The methodology is integrated, different research areas are combined to have a more complete geometric, material and structural knowledge of the object.

A multidisciplinary knowledge starts from an accurate archival research to reconstruct the urban evolution and the seismic history of the territory. Particular attention concerns the analysis of the damage suffered as a result of past seismic events and the acquisition of the plans of the buildings of the historical and current cadastral registers, useful for knowing the transformations carried out in the last centuries. The analysis of the morphology of the urban form consists in the study of the existing urban planning tools, which are updated and integrated

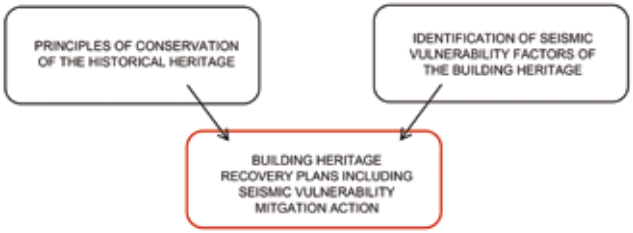

Fig. 2
Risk mitigation and recovery of small villages in seismic areas.

if necessary, with a digital survey of the roads and road fronts. In the third phase, for the surveys of structures with strategic functions or belonging to the artistic and cultural heritage, an in-depth survey is envisaged that includes structural elements. Finally, the use of photogrammetry on accessible urban fronts is particularly useful for identifying cracks and deterioration of walls. As regards the construction techniques and the characteristics of the materials, a fair approximation is allowed in the first two phases, and uncertainties are tolerated. However, minimal uncertainties are allowed in the analysis of the single building according to legislation, and the characteristics of the materials are studied with an on-site test campaign.

A multilevel assessment of urban seismic vulnerability

The proposed seismic vulnerability survey methodology is set on three levels, the first on urban scale to all building stock, the second for the SUM (Minimal Urban Structure) subsystem and the third indicated to investigate the structural performance of the individual building, for example directed a strategic building, cultural heritage or infrastructure.

Analysis of seismic vulnerability on urban scale

In the state of the art there are various methods of investigation of seismic vulnerability on an urban scale, these differ in the number of characteristics analyzed and in the accuracy of the results [3] [4]. The application of urban-scale methodologies is based on limited data (as construction period, construction type and main morphological characteristics) and they are defined simplified. The macroseismic method of Giovinazzi and Lagomarsino [5] and the procedure of the National Seismic Defense Group (GNDT) [6] with the additions proposed by Formisano [7] are among the most suitable for the study of historical buildings. The expected results from large-scale methodologies are statistical and are used to locate the main problems and define intervention priorities. The Giovinazzi and Lagomarsino method evolves from the EMS98 scale and integrates the

procedure to obtain a vulnerability index and the expected damage for macroseismic intensity. The technique uses a greater number of structural typological characteristics and always statistical results but with greater reliability.
The survey form for aggregate buildings proposed by Formisano is a modification of the level II form of the GNTD for masonry buildings. The original data sheet has been integrated with five new parameters to evaluate the aggregate condition (the altimetric interaction, the planimetric interaction, the presence of staggered floors, the typological and structural discontinuities and the percentage difference between the façade openings).
For investigations also extended to the infrastructural system of accessibility and mobility, reference can be made to the census protocols for monitoring defined in the recently approved *Linee Guida per la classificazione e gestione del rischio, la valutazione della sicurezza ed il monitoraggio dei ponti esistenti* [8]. The protocols are based on a multilevel procedure, the first step defines a priority scale to identify the macroscopic criticalities and in the subsequent phases a specific program of in-depth analysis, verification and safety according to legislation is defined. (Fig.3)

Analysis of the seismic vulnerability of the SUM subsystem, study of urban fronts
The second phase includes an analysis of the vulnerability of the urban fronts facing the road infrastructure selected in the SUM [9]. The data is indicative of the possible structural performance of the building and of the possible functionality of the infrastructural network in the event of a seismic event and subsequent rescue intervention. Structural masonry aggregates present the activation of a series of local collapse mechanisms [10] if damaged by an earthquake. The mechanisms are classified into first-type or out-of-plan mechanisms, and second-type mechanisms defined in the plan. The first are related to bending and overturning behavior, the second are due to damage from shear and bending.
The identification of possible mechanisms requires:
- a check of the structural units (US) that make up the aggregate
- identification of interactions for the condition being attacked

Subsequently they are analyzed:
- morphology of the building
- typology of horizontal and vertical structures
- link quality
- wall discontinuities
- anti-seismic devices
- presence of damage

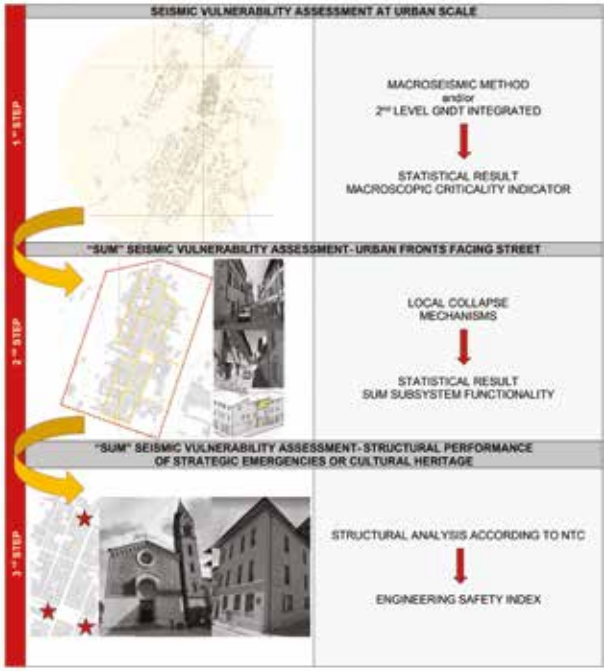

Fig. 3
Procedure of multilevel investigation of seismic vulnerability, city of Scarperia, Italy. (http://www502.regione.toscana.it/geoscopio/, https://www.google.it/maps/).

The study of the mechanisms of the first mode is the only one considered in the urban aggregate scale study is considered (simple overturning mechanisms, compound overturning, vertical and horizontal bending). The step has as its main objective the evaluation of the possible instability and partial collapse of the buildings located along the road network and in a historic village means analyzing significant parts of the building heritage. The proposed analysis presents a fair amount of uncertainty due to unavailable characteristics of the building, such as the real mechanical characteristics of the materials, but is considered acceptable for the size of the operational scale.

Analysis of individual element, structural performance of strategic buildings and cultural heritage

The investigation of the structural performance of the single building according to the legislation is the final step of the proposed methodology. The phase analyzes strategic buildings (hospitals, town hall, station ...) or buildings belonging to the cultural heritage, both identified in the urban subsystem of the SUM.

The verification for seismic actions of strategic buildings in masonry or reinforced concrete not belonging to the cultural heritage, is performed according to the technical standards for constructions in force, in our case the NTC 2018 [11]. The safety control according to regulations is based on in-depth knowledge of the structure, without assumptions. Compared to the procedure proposed in the previous phase, this step requires more knowledge:

- complete survey of the building (interior rooms and structural elements included)
- thorough knowledge of construction techniques
- mechanical characterization of materials based on a destructive and non-destructive on-site test campaign

For buildings belonging to cultural heritage, the safety control refers to the *Linee Guida per la valutazione e riduzione del rischio sismico del patrimonio culturale* of MIBACT (2010) [12] in accordance with NTC 2008, in force at the time. Also in this case, a thorough knowledge of the structure is required but a rigorous mechanical characterization of the materials is impossible. Investigations of materials in cultural heritage buildings are limited, non-destructive or semi-destructive as sonic test, georadar survey, thermal imaging, remove plaster or perforations. With such limited investigations, historical analysis and architectural survey play a fundamental role in the study.

If road infrastructures deemed strategic are included in the SUM, these will also need to be studied. The analysis of structural performance and safety measures will have to follow the priority scale defined in the urban-scale screening [8].

Conclusion

This contribution aims to provide a procedure for analyzing the vulnerability of an entire urban centre, based and contextualized on specific cognitive investigations developed on the building heritage. All urban-scale studies present the same difficulties, such as the enormous quantity of buildings to be analyzed in a limited time and with little economic funds. This involves the use of simplified methods with a relative degree of reliability of the results. The multilevel approach aims to fill some gaps with specific investigations on seismic vulnerability. These are focused on critical areas or specific urban subsystems such as the SUM, guaranteeing satisfactory knowledge and careful management of economic resources. In conclusion, the methodology allows to define specific guidelines for an effective risk reduction, combining the conservation and recovery needs of the historical building heritage with the mitigation of seismic risk.

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TERRITORIAL CAPITAL: A SOURCE FOR THE REVIVAL IN INNER AREAS. TOWNS AND NEIGHBORHOODS AT RISK OF ABANDONMENT. STRATEGIES FOR THE KNOWLEDGE AND THE PROMOTION AND RESTORATION

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A view of Calitri. Vito Galgano (Flicker).

The abandonment of the internal areas could be found in many elements, such as reduction of local services to the benefit of territorial ones, the lack of job opportunities, logistic difficulties due to bad infrastracture network. Inner areas have a common element, *territorial capital* that is not used, such as natural landscapes which are abandoned, built heritage (with or without historical and artistic value). Moreover, another element is the historical memory and the tipical traditions that mark each territory. In 2014, to counter the depopulation phenomenon it was developed the National Strategy for the Internal Areas (SNAI).
How can we choose a strategy that deals not only with development, but which protects these areas? We need to have an integrated vision of cultural heritage of every specific area, considerating agriculture, reastoration, economy,sociology, architecture ancd anthropology to realize a multidisciplinary strategy with common objectives (Carta di Armsterdam, 1975; ICOMOS Rural Haritage, 2019).
The cultural heritage network, investigated and protected, could become element for a sustainable development of inner areas, base don cooperation between neighbouring territories and inhabitants' participation.

Keywords: restoration, cultural heritage, identity of places, valorization

Introduction

In the big cities the topic of abandonment of the small towns and neighborhoods concerned, in the second half of the 20th century, a great part of Italian territory. In particular way, we talk about the internal areas, marked by a process of marginalization attributable, not only, to demographic decline, due to an ever-decreasing supply of jobs, but especially to the reduction of local services. Economic boom, industrial development and the globalization, but above all the higher value of the industrial productions at the expense of agricultural ones. It provoked an ever-decreasing migration from inner areas, devoted to agriculture, to industrialized cities, condemning to depopulation and to heritage and landscape degradation.
In the years the situation of the small towns, municipalities where population is less than 5000 inhabitants, has not improved, on the contrary, there have been fewer economic and job opportunities, the reduction of local services to the benefit of territorial ones and difficulties related to a scarce infrastructure network. These are features which increase the

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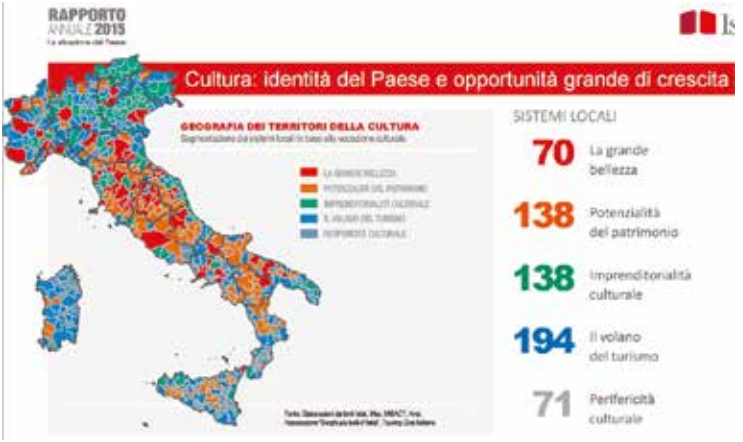

Fig. 1
Annual report ISTAT 2015.

settlement diversity in the country, as proved by the contrast between big and middle urban centers that have good services for population, against the small internal areas with a lack of services. In 2014 to counter the phenomenon of abandonment in this territories, government formulated a National Strategy for the Internal Areas (SNAI, 2014) , with the objective of returning a central position to these territorially marginal communities. SNAI identifies the inner areas as zones really far from the centers with essential services, which are linked to education, health, mobility, access to internet. In fact, the internal areas have not these services, but present a large quantity of territorial capital that is not used, i.e. natural landscapes which are abandoned, material and immaterial cultural heritage, built heritage(with or without historical and artistic value). In addition, there are human, cognitive and social capital that contain the historical memory and the tradition of every land (SNAI, 2014). SNAI strategy, starting from analysis of social and infrastructure conditions of places, through economic, architectural disciplines and disciplines of industrial development with the following objective: the recovery, the strengthening and the promotion of the internal areas (Barca, 2016).

A strategy for the development of the internal areas: the recovery and the networking and cultural capital.

In spite of many fragilities, inner areas enclose a territorial capital made by a complex sedimentation operation of cultural, historical and economic processes, succeeded over the centuries. Territorial capital could be recognized like a driving source for the regeneration of territory (Fig.1). The identification of a strategy, which has to develop inner

areas, starts from an integrated vision of knowledge and conservation of cultural heritage. Investigating all aspects of the disciplines of each specific field: economy, politics, urban planning, architecture, restoration, anthropology, but also geography, agriculture and sociology. The lines of action are connected to each reality, the local heritage, local community economic resources for the implentation of the strategy.

SNAI strategy provides the activation of latent cultural capital, through two different channels: offer of essential services for the inhabitants and the promotion of the local development based on valorization of resources in each territory. In according with the different cultural, social and economic characteristics of every zone, it is clear that there isn't a unitary strategy, but it will have to project a plan "case to case" which consider the unicity of every area. Incorrectly, in the last decades it thought about heritage protection processes like a anti-economic actions, but today, thanks to new approaches for cultural economy there is another idea. The protection of artifact, which includes physical object, its history and its meanings in the community, can create virtuous processes of joint development in a territory (Oteri, 2019).

Protection and valorization processes can't be separated and come from knowledge of the product and from cultural and social value that it represents, in fact *"the truly aim of the artistic heritage[…] is not a protection for its own sake, but it is the knowledge"* (Montanari, 2014). Therefore we can affirm that valorization of the cultural objects must be aimed at increase of immaterial resources and of the human capital. Moreover, the community of the territory plays an important role in the decision-making and management phase of the entire cultural capital (Napolitano, 2015). Local communities should acquire a double awareness of inherited wealth. In addition, population is called to be responsible for history of the single territory. This is the reason why it is important to protect and valorize the cultural capital, not only by direct government action, but also by a inhabitants, local operators, small enterprises' collaboration. (Fig.1)

It is not possible interesting in cultural heritage without considerating its context. Consequently, it can't be identified a conservation and valorization strategy, if we have not a complex vision of system and territory. It is useful the planned conservation , which is not limited to architectural field, but that extends to landscape and agriculture. In this way, it is possible unify features of conservation and valorization through participation and economic objectives (Della Torre, 2014).

The intervention of conservation of cultural heritage of inner areas is necessary for the beginning of territorial cohesion process and cultural investments, which means sustainable development for improving the quality of life of local inhabitants (Montella, 2015,). The fields

Fig. 3
Sponz Fest.
Federico Iadarola
(Flicker).

of application of intervention concern three dimensions: territorial scale, urban and architectural ones for every building. Every element contributes to cultural heritage and to its historical stratifications succeeded in a specific internal area.

The networking of territorial capital becomes essential because it allows the definition of a system that integrates local possibilities with neighboring territories. Moreover, it identifies existing connections between ecosystem and territories, between landscapes and architectures, with a objective: realizing a more complex territorial structure. The designated network becomes an element for a sustainable development of the internal áreas, based on the cooperation between territories and inhabitants, who are holders of the identity of places (Della Torre, 2006), by actions of local associations that can protect and generate an economic process at the service of the identified goods.

The internal areas, although affected marginal phenomena, depopulation and lack of services, have always shown a propensity to flexibility and change. The revival for these areas must be based on the recreation of internal dynamic of territory, focusing on cohesion, collaboration of different actors in the resources of knowledge, skills and governance (Marchionna, 2010,). Starting from different sectors like agriculture, restoration, economy and sociology, it needs a joint action between administrators, local community and experts. It's very important to identify a conservation plan and maintenance operations to develop a fruition and conservation system of territorial capital that is not used.

The neglected development. The fragilities of specific actions.

In the last decade, there have been many proposals and actions for the revival of inner areas with problems about identification of strategy and realization. Some local governments proposed limited actions of conservation and valorization, in particular restoration or reuse of abandoned cultural heritage, to be used for accommodation or museum activities, not considering the need of the entire territory. Consequently, it provokes a sort of disinterest of places and people. We need to focus on a strategy that marks territory needs, economic and productive recovery programmes. The involvement of communities in the decisional phase is important because they are the first beneficiaries of measures.

For example, restoration project will have to elaborate a medium-long term system in relation to knowledge, conservation and valorization, that is not founded on the concept of cultural heritage, as attractor, but as a place where there is a constant knowledge and protection. In addition to operations of protections and valorization, the recovered cultural heritage must be inserted in the daily life of community to increase the provision of services for population (Oteri, 2019). (Fig.2)

In the last years the interventions realized for regeneration of the internal areas by cultural field have focused on mass tourism and on the entertainment of the occasional user, rather than a long term action for a plan which includes citizens in the events management. The mass tourism has been present in many villages disproportionally with negatives effects on monuments and sites of interest, exploiting resources without a local contribution. We need to promote cultural tourism, that, in addition to be sustainable for the ecosystem and the cultural heritage, respects local communities identity (ICOMOS, Belgium 1976). We will have to encourage cultural promotion activities that respect heritage. Helping the exchange between occasional users and communities, creating virtuous processes of valorization of heritage and, in particular, of management. It could be a way to find an economic process for citizens (ICOMOS Mexico, 1999). It's about having a systematic vision and thinking in territorial capital not used as activator of processes and not some objects without development. In fact, if we exclude them from relation with culture, they can be dangerous mechanisms for territory. (Fig.3)

Operational tools, experiences and case studies

But how can we connect the cultural heritage network making it accessible not only to local communities but also to users? A correct communication provokes in the users the desire for knowledge, which can be shared with local community to create a participation process to fruition and valorization of cultural heritage. In this context, the community has an

Fig. 4
A view of Pescina. Domenico Aliperto (Flicker).

Fig. 5
The signage of the Silone path.

important communicative role, that offers an appropriate support for the narration and the transmission of cultural heritage (Prescia, 2017).

The Card of cultural heritage promoted by ICOMOS in 2008, better known as Card of Ename, explains the importance of communication, that is diffusion or presentation, as a relevant part in the complex process of the conservation of the heritage. The objective of the card is identifying the founding elements of interpretation and communication in cultural heritage, identified as features that accompany the conservation for improving the understanding for the audience (ICOMOS, 2008).

The literary paths represent significant examples aimed at the narration of cultural heritage, that by identifying the places, described by the authors of the literature in the landscape, become the means for local development and enhancement. The realization of the Silone Path inside the Sirente-Velino Park (Fig.2 - 3). Ignazio Silone is a wiriter and journalist of '900. Through his works set in the Abruzzo countryside, he denounces the weakest classes' social problems. His childhood landscapes, such as mountains, the plain born from the drainage of lake Fucino and the small villages built, from which he had to flee because of the earthquake in 1915, are the settings for his works belonged to Verism. It deals with a literary path that, through a hiking itinerary, makes visible the atmospheres told by Silone and traced, after a careful cognitive analysis, on the territory of Pescina

and Valle-Giovenco. Along the path the user reinterprets the space, according to suggestions aroused during the reading, but also knows the intangible heritage and identity that the places preserve (Colecchia, 2018,).

The project proposals must be supported by local community, as promoter of the process of change and awareness of the territorial potentials. This last element explains the need to reappropriate of places, in terms of space, memory and values. Regeneration doesn't concern only the places, but the artistic, social and agricultural activities, directed, not only, to external users but also local community. The community must be seen as a source of alternative support to tourism. Then community is recognized as bringer of knowledge integrated with external systems to promote the immaterial and material heritage. (Fig. 4)

An important example of territorial regeneration, linked to the cultural promotion of an internal area through a series of artistic activities, is represented by the Sponz Fest, born in 2013 in Calitri from the desire to recover the heritage of local traditions linked to the music of the wedding (Fig. 4-5). Through a long-term planning, the festival proposes itself as an attraction for the entire area, capable of involving not only the local community but also all the neighboring territories, thus creating a network of collaborations with small artisans, traders and operators who they take care of hospitality (Bovio, 2020).

The institution of observatories and laboratories capable to increase knowledge for development of territory, could be useful to fulfil the desired cooperation between local community and administrators.

The issue of accessibility in its broader vision is of fundamental importance for the development of internal areas. We must not limit to the design of infrastructures, such as roads and railways, elements that are often lacking in inland areas, but also to accessibility to services and information through broadband, or the freedom of use of the territory of any traveler with or without motor or perceptive difficulties.

Another important aspect is agriculture, considered a productive, formative, educational and social inclusion activity. Recently, this sector has changed in its objectives, in fact it is focused on environment protection, rural development and the quality of harvests in relation to quantity (Amodio, 2019). Priority is given to supply chain of agri-food products and slow food excellences, not only for sustainable development, but also for the creation of itineraries of wine excellences, as proof of the fact that, every sector of territorial capital has to contribute for development of cultural tourism.

Internal areas have to restart from regeneration project that recovers and converts the suspended and underused heritage. The high consumption of soil and natural resources has given rise to a reflection on the management of existing built heritage. In fact, the architect will choose the intervention of the built on the built combining the protection of historical, aesthetic and cultural aspects of an architectonic object with the demands of contemporary man's life (Losasso, 2016). (Fig.5)

Concluding remarks

We can conclude by saying that cooperation by the actors involved in the regeneration process, such as local authorities, associations, professionals and local communities, is indispensable for the revitalization of the internal areas. Dialogue and the exchange of ideas offer the basis for the strategy of reactivation of architectural heritage, of rural settlements and of new communication campaign for the inner areas, respecting the ecosystem. A reflection is indispensable: if the new strategies are not adequately supported by diffusion of useful services to citizens, the regeneration processes remain blind and without a future.

A correct political action applicable to internal areas must prevent the emigration of inhabitants, as this would give rise to an irreversible process: if a village is empty it will be very difficult to be reborn. Policy must therefore have a medium to long-term vision in order to be able to devise and implement appropriate strategies to avoid depopulation. It is

possible through sustainable development, not only in economy but also in the natural system. It is necessary offer to communities means to apply transformation processes as economic, social and cultural resources.

Lastly, administrative and bureaucratic support is necessary to improve the sense of belonging to territory for the improvement of conditions.

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PERMANENCE IN ABSENCE. PRESERVATION OF HISTORIC AND ENVIRONMENTAL HERITAGE OF VAL CERVO (PIEDMONT, ITALY)

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Materials and cosntruction systems in Sassaia (Campiglia Cervo).

The medium-upper Val Cervo, in the province of Biella, in northern Piedmont (Italy), like many other pre-alpine and alpine valleys in the region, has experienced radical depopulation in recent decades. The decline of industrial activities has caused a strong depopulation, in a previously economically very active area. This part of the valley is composed of about forty small urbanized nuclei, characterized by solid constructions, thanks to the use of resistant materials and a consolidated building capacity of the local workers. In the nineteenth and twentieth centuries, the valley has seen patrons and open-minded entrepreneurs operating here, who have set up a program of enhancement and also protection of environmental resources and implementation of infrastructure. Despite the abandonment, the good quality of buildings and the permanence and maintenance of an extensive infrastructure network allows the survival in good conditions of the built heritage and the context. This is possible not so much because the area has not been touched by mass tourism, but above all because a different way of using resources has been set up for decades. The prospects for a revival of the valley pass through the lesson of the past: the echoes of Ermenegildo Zegna's "green thought" and Adriano Olivetti's "gentle capitalism" seem to have firmly established themselves in this area and made it resilient, and they still seem fundamental in perspective a revival not only economic in a slow and conscious tourism, but also in a deeper anthropological perspective.

Keywords: Abandoned villages, Depopulation, Mass tourism, Conservation

The Val Cervo (Fig. 1) is a historic crossroads of high-altitude connections between Piedmont and the Aosta Valley, reaffirmed and enriched in modern times by bold communication routes wanted and financed by two great local figures, senator Federico Rosazza and entrepreneur Ermenegildo Zegna

The valley, about fifteen kilometres long, for centuries benefited from a flourishing economy based on sheep-farming and trade in the mountain part, extraction of syenite in the middle part, near Balma, and yarn processing, in particular wool, in the lower part, near Biella.

While the lower part of the valley, almost flat and close to the outskirts of Biella, has the characteristics of the urban centres of the plain and has suffered from a progressive industrialization and urbanization in the second half of the twentieth century, which has absorbed and in some cases erased the historical characters (except for some parts of the centre of Andorno

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Fig. 1
The site.

Fig. 2
Ancient buildings in Santa Maria di Pediclosso (Campiglia Cervo).

Micca), the middle and upper part of the valley, from Campiglia Cervo to Piedicavallo, has maintained and keeps intact its historical and environmental characters.

Here were born building contractors very active in the construction of new infrastructures immediately after the unification of Italy, throughout the country. Alongside specifically rural construction, there is no lack of episodes of great quality, such as the large residences built for their families by building contractors linked to the Savoys (above all Villa Magnani and Villa Biglia in San Paolo Cervo and Villa Piatti in Roreto).

Federico Rosazza Pistolet (1813-1899) owes the first part of his surname to the town in the middle Val Cervo, Rosazza, which gave him his birthplace, and where he died. He was a lawyer and politician. Like others of his fellow countrymen he dedicated himself, in the last decades of his life, to financing the construction of works and infrastructures useful for daily life and works in the valley. The road connection between the Sanctuary of San Giovanni, which rises upstream of Campiglia and Rosazza, and that of Oropa, in the adjacent valley, is perhaps his best known work. It includes, among other things, a daring tunnel, in the highest part of the route, dug with the help of the workers of the

entire valley. A Freemason and a lover of spiritualism, he also created the mule track to Gaby, always assisted and inspired by a fellow countryman, Giuseppe Maffei (1821-1901), a unique self-taught figure, artist and teacher[1].

The contemporaries Giovanni Pietro Magnani (1812-1893), known as "Magnanin", and Giovanni Battista Biglia (1830-1908), who built the residences bearing their names in San Paolo Cervo, also financed the construction of bridges, roads, wash houses, fountains in the central part of the valley[2].

These well-deserving personalities of extraordinary industriousness and munificence remained to the end men of the nineteenth century. Ermenegildo ("Gildo") Zegna (1892-1966), Count of Monterubello (title acquired in 1938), entrepreneur, founder of the homonymous textile company, a true international excellence, was instead a true innovator. He proved capable of deeply linking the productive presence to society, and of acting on territorial resources with a view to enhancing and preserving the common good.

[1] On the figure of Maffei see G. Valz Blin, Giuseppe Maffei 1821-1901. La vita e le opere nel centenario della morte, Eventi&progetto editore, Biella 2001.
[2] We refer to: C. Ghiraldello, Ricerche d'arte. Percorsi biellesi, Edizioni Gariazzo, Biella 2012.

Fig. 3
Ancient buildings in Forgnengo (Campiglia Cervo).

The family business was founded in Trivero, not far from Val Cervo, where Zegna, starting in 1932, had various infrastructures built, including a film theatre, a public library, a kindergarten, a gymnasium, the Zegna Care Centre with the maternity and children's clinic, and the Albergo San Bernardo, donated to the Province of Biella in 1972 and now the seat of a hotel school.

Above all he created the panoramic road that bears his name (Panoramica Zegna), which connects Trivero to Val Cervo, near Valmosca, and which should have continued to the adjacent Aosta Valley. The Panoramica Zegna is not only a road, but is an infrastructure firmly linked to the context and landscape of the mountains of Trivero and Val Cervo. Zegna, according to what was called his "green thinking", imagined it to be at the center of a mountain tourism project that would guarantee not only access for all to places of extraordinary beauty, but above all their enhancement and protection. The road was started in 1938, according to the project of the engineer Silvio Grupallo of Biella. In 1939 Poggio Caulera was reached at an altitude of one thousand meters. In 1947 it reached the Bocchetta di Stavella, where a bowling alley with sixty-four fields was built. In Margosio

Fig. 4
Community glacier and ancient buildings in Piedicavallo.

Fig. 6
Buildings in ruins (mountain pastures near Rosazza).

was built the alpine colony "Monte Rubello", summer receptive structure for the children of the workers of the Biella industries.
In the fifties the highest altitude of the route was reached, where the Bielmonte accommodation and tourist facilities were built. In February 1977 it finally reached the bottom of Val Cervo, near Valmosca, and the branch for Oropa realized by Rosazza between 1889 and 1898, with the characteristic tunnel. The Panoramica Zegna extends today for 64 km. Between Trivero and Val Cervo Zegna, he had about half a million conifers planted an uncountable quantity of flowering plants, mainly rhododendrons (the so-called "Conca dei rododendri" is famous), azaleas and hydrangeas.
Since 1993 the whole area is a naturalistic area, called Oasi Zegna, managed by FondazioneZegna in collaboration with Alp Action - The International Corporate Fund for the Environment (FAI) and other bodies.
The work of Ermenegildo Zegna in a perspective of specialization (and respect) of the territory is not different from that which was experimented in Valle d'Aosta with the Plan of 1936-37, at the impulse of Adriano Olivetti (from Ivrea, not far from Val Cervo), another important protagonist of the conversion of industrial profit to the benefit of the community[3]. Olivetti and Zegna were both interpreters of a vision of "gentle capitalism"

[3] His territorial experiences are effectively summarized in P. Gabellini, I luoghi dell'urbanistica e dell'architettura di Adriano Olivetti, in Adriano Olivetti l'urbanistica, l'architettura, l'INU, atti del convegno (Perugia, 5 dicembre 2014), Roma 2015, pp. 38-45.

aimed at bringing back to the territory part of the economic resources deriving from an industrial activity aimed not only at the local market but also at the world market, for the benefit of the community. Although Zegna lacked Olivetti's political vision, the ability to make his environmental protection actions a method, Zegna's work was aimed at improving working conditions and the quality of life in the community through welfare works and the provision of infrastructure and leisure areas. Olivetti's aim was to create real "concrete communities" (it could be translated as "active and effective communities"), characterized by participatory programming[4].

In any case, the works carried out in the upper and middle Val Cervo by the patronage of the nineteenth century and most of the twentieth century are of great construction quality, which drew on a consolidated technical knowledge, more engineering than architectural, more prone to *firmitas* than *venustas* (Figg. 2,3,4,5). Character that seems to permeate moreover great part of the building of the whole valley, with such a continuity in the time that the dating of the buildings or part of them on a stylistic and/or constructive basis is practically impossible.

The building heritage of the valley, although of ancient origin, is characterized by the use of local stone material in large squared ashlars and chestnut (or beech) wood for the horizons and roofs. The pushing structures (vaults and arches), relegated to the basement or to the second floor above ground, are almost totally missing. The building types are simple, with elementary wall boxes, preferably developed in height, up to three or four, or even five floors above ground. The oldest scheme is the one common to most of the prealpine and alpine building, with rooms for the ground and second floor (or warehouses, in case of articulated structures), above which, on one or two levels, there are the rooms for the storage of wood and hay, generally open on the main front, which is usually exposed to the south. There are also influences of the Walser culture, limited to the upper valley, most likely borrowed from the communities of the adjacent Gressoney valley. However, there is no evidence, not even in the past, of Walser linguistic strains in Val Cervo, although there is no lack of Germanic assonance in the local dialect. The nineteenth-century buildings in the major centers of the valley also consist of multi-family buildings for the families of quarry workers. These are mostly buildings of even conspicuous size, on three or four floors, with different housing units on each floor. The complexes at high altitude, at the mountain pastures, present instead an extreme simplicity, as they are seasonal settlements (and are the ones that have suffered

[4] V. Ochetto, *Attualità di Adriano Olivetti. Cenni biografici con interrogativi*, in Adriano Olivetti. L'impresa, la comunità, il territorio, atti del convegno (Roma, 21 novembre 2014), Fondazione Adriano Olivetti, Roma 2015, pp. 18-27, citazione da p. 20.

Fig. 7
Modern bridge collapsed during the flood of October 6, 2020.

the most consequences due to abandonment, given the extreme environmental conditions and the distance from towns and villages – Fig. 6). Many are the buildings left with the facing at sight, especially in rural areas, while in the inhabited centers there is a certain predominance of the use of plaster, both with rustic and smoothed finish. In the oldest buildings there are still traces of pictorial decorations in imitation of nobler finishes (ashlar, architectural elements), with a marked polychromy. The dates engraved in the stone abound on the portals, which are generally very simple, trilithic, without decorations. Everywhere there are testimonies of popular devotion, in the form of sacred images painted on plaster. There is also an abundance of secular painted representations, referring to the Piedmontese characters of the commedia dell'arte. Sundials are also quite common. All these traces are affected by the lack of maintenance, which followed the depopulation. Many have been better preserved, but only as "paintings" inside completely renovated plasters.

Even if Val Cervo is very close to the provincial capital and the good infrastructure network, the whole valley has been heavily affected by the crisis of the main productive sectors (sheep-farming, extraction of syenite and yarn processing) of the last decades, which

has seen the disappearance, with very few exceptions, of manufacturing activities in the textile sector that were the driving part of the local economy. The progressive devastating crisis has led to the depopulation of the approximately forty or so villages in the upper and middle part of the valley (-90%, from 7,000 to 700 inhabitants). The inhabitants of the municipalities in the lower part of the valley have instead continued to live on the site but have had to find new jobs in the nearby Biella.

Almost all the settlements, despite the deep demographic and economic crisis that has hit the valley in recent decades and the almost total absence of residents in almost all the lower part of the valley, benefit from an enviable solidity due to the quality and resistance of the materials used and the undoubted expertise of the builders. Also the context maintains intact its character and intrinsic beauty, thanks also to the extensive care interventions carried out on the capillary network of trails and mountains paths by the three municipalities of the upper-middle valley and the mountain communities.

The built heritage resisted, among other things, the 2002 flood and the even more disastrous flood of October 6 of 2020. In particular the infrastructures built by Rosazza Pistolet, Magnani, Biglia and Zegna have resisted, while the most recent works have been literally crumbled by the floods of the torrents (at Piedicavallo five of the six bridges were destroyed or heavily damaged, at Rosazza one bridge was completely destroyed, while a section of the main modern road of the valley, near Malpensà di Campiglia, was swallowed up by the Cervo). The damages of one day, attested also in this paper by one dramatic photographic image (Fig. 7), will require huge works, and works for many years.

In addition to the good behavior of the structures built in the face of abandonment (but until when?) and a good preservation of the environmental characters, Val Cervo is also distinguished by another peculiarity: compared to many other parts of northern Italy, which have a proximity to large urban centres (just over an hour's drive from Milan and Turin) the valley has not seen the proliferation of holiday homes, there have been no new buildings. There is an almost total lack of mass tourist attractions (sports facilities, great hospitality buildings) or other elements of attraction.

It would therefore seem to be possible to say that the reason for the preservation of the characteristics of the Val Cervo territory is due to the absence of mass tourism. But it can be demonstrated that it is rather a consequence of a different type of tourism and local life, and of the organization of the context.

The traditional shrewd use of resources, heritage of this and other mountain social groups, has been confirmed and in some way validated, and increased, by the way in which innovations have been introduced even of great territorial impact. In other places in the country, the

construction of infrastructure and tourist facilities has had and continues to have devastating effects. There is an almost complete replacement of the social structure, a mostly seasonal use of the settlements, a proliferation of modern buildings that prevail over traditional ones, often subject to overwhelming restructuring. The more peripheral nuclei, difficult to reach, succumb to this disparity of fruition, which distinguishes between attractive and easily reachable places and places perhaps of greater charm but without the offers usually proposed to mass tourism. In Val Cervo this disparity does not exist.

We can think, but it is in fact demonstrable, that the nineteenth-century entrepreneurial patronage, even with its paternalistic connotations, the "green thought" of an Ermenegildo Zegna, as well as the echoes, not too far away, of the "gentle capitalism" of an Adriano Olivetti and his ideas of participation, have built a strong identity in these places, such as to resist the trivial as well as aggressive update that has affected many other places of quality.

The abandonment, which elsewhere has devastating repercussions, from which it is impossible to go back, here is configured as a suspension. A sort of state of waiting. The sap that allows this continuity of potential vitality, in the absence of intervention by individual owners, should be seen in the action of the community in keeping alive the network of routes, connections, triggering a slow tourism, certainly marginal in numbers, but also useful to guard the territory.

Obviously it is necessary to question the evolution of this state of affairs. Apparently the abandonment of these places there is no remedy, as it is unthinkable to re-establish an economic autonomy such as to ensure a stable repopulation and reconstruction of old communities. Nor does the option of a *sic et simpliciter* enhancement of the human presence in a context of only holiday homes appear acceptable. Other hypotheses, partly already experimented (diffuse museum) are providing secondary results. Unfortunately, unlike what happens in other Italian Alpine areas and neighbouring countries, the possibility to create or reactivate a network of connections with the adjacent Alpine valleys is hardly feasible, even if historically attested: the Sèssera valley, in the north-east, is practically isolated and is only served, in the upper part, by the Panoramica Zegna; the Sesia valley, with the tourist and sports area of Alagna and Monte Rosa, is too far away; the connection with the adjacent Lys valley, where Gressoney is located, is only possible on inaccessible slopes and mule tracks that require long travel times, and only up to Gaby. The connection with the valley of Oropa, where the famous Sanctuary is located, is also possible only thanks to the road built by Rosazza with curves and gradients calibrated to the way of moving by mule rather than to the needs of modern vehicular traffic.

However, it seems in any case the strengthening, the care and the valorization of the already present infrastructural network, of which history and reasons have been briefly outlined, the first resources to oppose the abandonment. At the same time, a work of implementation of the knowledge of the settlement system of the valley must be started, which passes through a census of the buildings, their study, the formation of a cognitive atlas useful to delineate their identity. Also in order to avoid the always possible dissolution due to upsetting interventions of "recovery". The pivots on which these activities can rotate are some consolidated presences such as the Bürsch (mountain community) and the religious center of the sanctuary of St. John, with the great Hospice. And, of course, the environment, which has in the Zegna Oasis a consolidated and well-known presence in a transregional area. A last significant aspect to take into consideration is also the construction of a communicative profile of Val Cervo and its presentation and diffusion. Also in this case the example to be followed is that of FondazioneZegna, and the signs of identity of the valley, which are environmental and cultural signs. Think for example of the symbolism of the heraldic coats of arms of the municipalities of the valley, which see present the bear, as in that of Biella and the province of Biella. Bear that also recurs in popular traditions, for example in the game boards engraved on stone seats of Forgnengo, one of which proposes an atavistic recurred between bear and three hunters.
The challenge to abandonment, the approach to an identity that seems to be neglected, but which runs "under-the-radar", is obviously played first of all on the anthropological level and on the ability to explain and share its contents.

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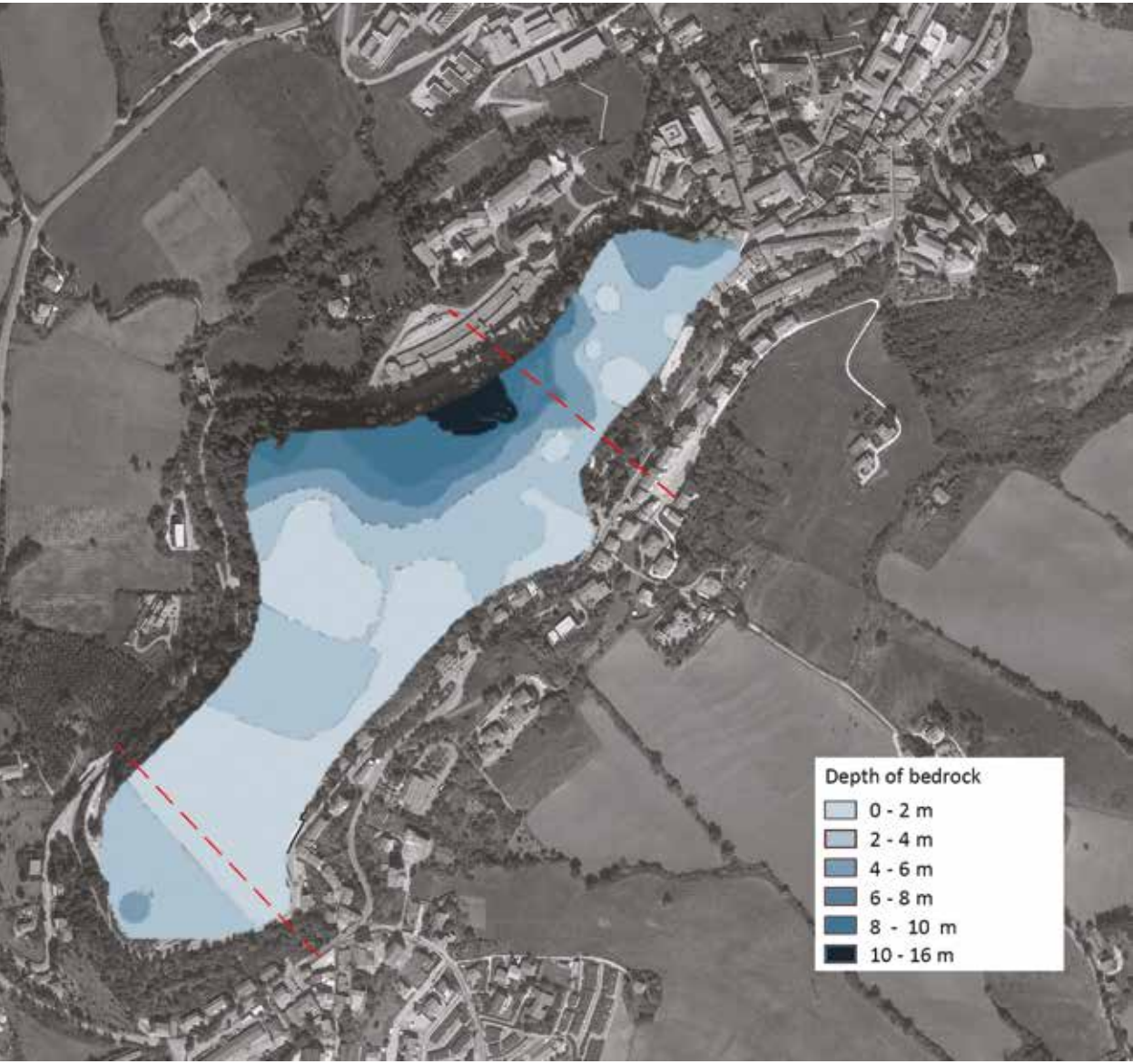
Depth of bedrock
0 - 2 m
2 - 4 m
4 - 6 m
6 - 8 m
8 - 10 m
10 - 16 m

VULNERABILITY OF HISTORICAL CENTRES: THE CASE OF CAMERINO (MARCHE REGION)

Enrica Petrucci, Lucia Barchetta, Diana Lapucci
Università degli Studi di Camerino-Italia

Depth of bedrock: it is evident that part of the northern sector of the arenaceous relief is characterized by very thick cover deposits, at places even higher than 10 mt.

The seismic activity that has always shaken the Italian territory and especially the latest events (earthquake in Central Italy 2016) - highlighted again the structural fragility of the historic centres, which are mostly made up of masonry buildings, often of poor quality, and characterized by typical and specific vulnerabilities that do not allow sufficient resistance to the seismic phenomenon. In particular, the small historical centres in the Marche region are mainly characterized by a "spontaneous" architecture, generally made up of poor materials. Moreover, these historic centres are located in internal areas with high seismic risk and have, consequently, a very high exposure linked to different factors and for this reason, it is extremely complex to characterize their vulnerability and predict their damage conditions. In recent years, the Marche region developed a susceptibility to seismic risk due to the intensification of earthquakes, with a frequency of events different from what can be estimated in probabilistic terms. The different local conditions have had a decisive influence on the damage to the historical-artistic heritage which, in many situations, reached the almost total collapse of the structure. In the present research, a methodology is applied for an assessment of the vulnerability of historic centres at an urban scale, analyzing, in particular, a case study (Camerino) to verify how some conditions (historical evolution, aggregation systems, construction techniques) and some factors (site amplifications, details locations, transformation level) affect its fragility.

Keywords: earthquake, vulnerability, historical centres, methodology.

Introduction

In the methodological approach, an accurate survey of the damage caused by seismic events is expected and, in general, an assessment of the building clusters vulnerability; the information will be managed through a GIS system for the mapping of damage and vulnerability from which to potentially deduce the actions aimed at risk reduction and prevention. The assessment of the building vulnerability as part of an urban-scale seismic risk analysis is certainly one of the critical points for which the choice of the level of investigation is fundamental. For this reason, the existing procedures for assessing the vulnerability of buildings have been defined to achieve different levels of knowledge according to the nature of the case study. In Italy, survey tools and evaluation methods based on typological recognition (called 1st level) and on the survey of characteristic factors of the seismic behaviour of buildings (called 2nd level) have been created and used for the territorial risk analysis on several occasions.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

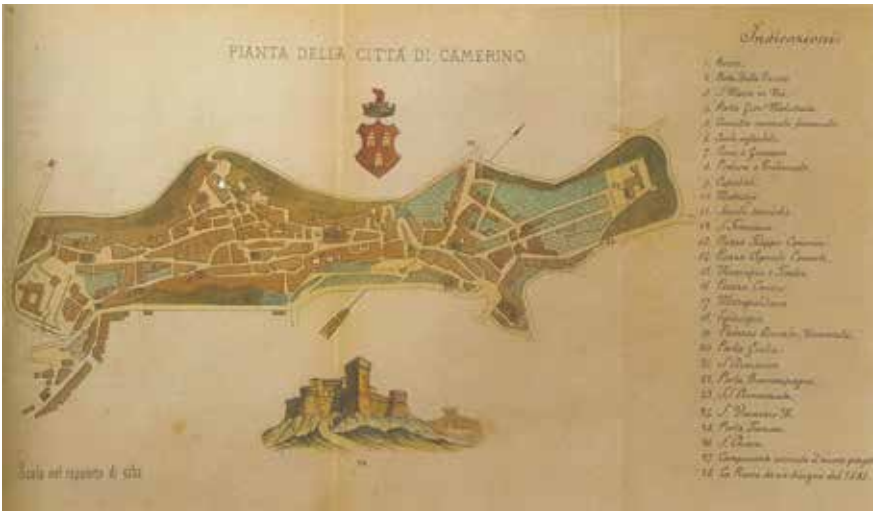


Fig. 1
Map of the City of Camerino. In "Camerino e i suoi dintorni", Aristide Conti (1872).

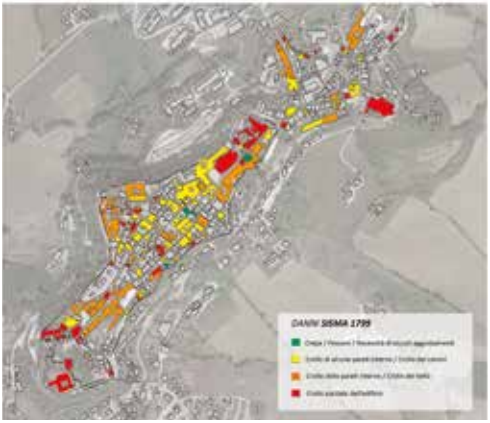
Fig. 2
Damages related to the 1799, 1997-98, 2016 earthquakes in Camerino.

In-depth knowledge of the conditions of seismic vulnerability is required to carry out analysis aimed at reducing seismic risk and creating damage scenarios. This knowledge is based on the identification of the typological and morphological characteristics related to specific cases. In particular, the study carried out on the historic centre of Camerino is taken as a case study, due to its significant exposure to frequent earthquakes that cause specific vulnerabilities; various parameters affect the structural behaviour of the buildings that are arranged in clusters, following different layouts based on the orographic configuration of the site. The most relevant parameters are represented by the constructive characteristics and their evolution in history.

Characteristics of the case study: the historic centre of Camerino

The historic centre of Camerino has been identified as a case study as it represents one of the most affected historical centres after the 2016 seismic events and which still has a very large "red area" (not accessible area due to the damages). Camerino has a high historical-cultural value and it is possible to find a vast amount of available data on local seismic history. This offers the opportunity to expand the horizons of research, considering a period during which the behaviour towards the earthquake has profoundly changed, also concerning the evolution of the specific reference regulations. (Fig. 1)

The city of Camerino (from Kamars: rock, fortress) is an ancient settlement of the *Umbri Camerti* and it has its roots in the Neolithic, after which it became an Umbrian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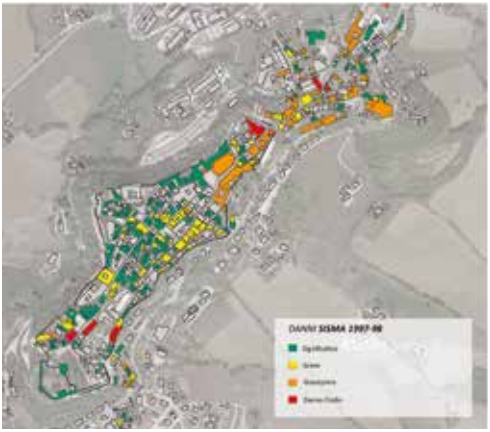
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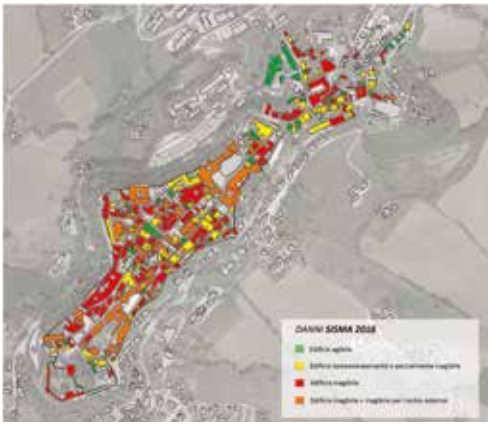
DANNI SISMA 2016

Fig. 4
Typological classification of building clusters in the historic centre of Camerino.

stronghold. In the Roman age, it had an important role, as evidenced by the alliance treaties stipulated with the city in 309 BC which guaranteed the city considerable importance until the third century. As bishop's see from 465, it had a vast ecclesiastical jurisdiction for over a millennium. After the Lombard conquest, it was the capital of the marquisate and the duchy which was part of the one of Spoleto (6th - 8th century). Charlemagne elected it as the capital of the homonymous March, which stretched from the Apennines to the Adriatic Sea. First Ghibelline municipality, later it became a Guelph stronghold and seat of the pontifical legislation of the Marca (1240) for which in 1259 it was destroyed by Manfredi's troops. The city was rebuilt by Gentile da Varano who established in Camerino the foundations for the lordship of his family since the second half of the thirteenth century. Under the same *Signoria Da Varano*, which lasted until the middle of the 16th century, Camerino experienced the most intense political and cultural period, interrupted only by the ousting of Giulio Cesare Da Varano by Valentino (1502) which, however, did not prevent the son Giovanni Maria to recover the state in 1503 and to acquire the title of Duke. From 1545 the city returned under the direct dominion of the Church as the capital of the Apostolic Delegation. Following the numerous sixteenth-seventeenth-century amalgamations, of the oldest fabric, there are only precise testimonies of the medieval phase, brought to light under the plaster through "ruderization slots". Over the centuries, the town has been heavily damaged by frequent earthquakes, with epicentres in the central and central-southern Apennines. The most significant are those of the eighteenth century (1799) when considerable damage was recorded to the buildings in the historic centre. During the nineteenth and twentieth centuries, the episodes followed one another in particularly close sequences (1979 and 1997) which seriously damaged most of the historic centre of Camerino. The recent 2016-2017 seismic sequence has again damaged the same buildings located within the historic centre, where a large red area has been established, which is still present today. (Fig. 2)

Geological setting of the area: seismic hazard

The historic center of Camerino develops essentially on a arenaceous formation. Around the historic center there are a lot of landslides, which is a frequent condition for all the towns in the Marche region morphologically located on a hill. These landslides, in addition to their geomorphological significance, also have an anthropic component. Many of the landslides we see today have recently reactivated for anthropogenic reasons, that is why they are linked to the transformation of land use.

The geomorphological seismic hazard is connected to the different seismic response of bedrock on which the historic center is built. Different and/or severely fractured geological formations or the presence of thick unconsolidated sediments can generate seismic waves amplification phenomena or, in general, different acceleration peaks during earthquakes. In Fig.3 it is possible to observe how part of the northern sector of the arenaceous relief is characterized by very thick cover deposits, at places even higher than 10mt. The red lines indicate two passage areas: these anomalies could indicate the presence of one or two faults, and if it is not, they are still two weak areas in which the substrate is deeper and there is a clear distinction between one side and the other. (Fig. 3)

What we can expect from the damage survey is that the buildings located in the deeper bedrock areas should be the most damaged. Very significant damages should be also found in the buildings located along the edges of the arenaceous plate, where seismic amplification phenomena are associated with the morphological effect connected to the presence of steep escarpments.

Description of the main elements that determine the high vulnerability of the historic centre of Camerino

The orographic characteristics of the site on which the historic centre of Camerino lies and the stratification of the building fabric, subject to important replacement or reconstructive operations, are factors of local vulnerability. The first analysis concerned the development of the building clusters as a result of a series of transformations, starting from the elementary cells that developed in a complex system, characterized by the sharing or simple juxtaposition

AEDES	
RESULT	
A	0,1
B	0,2
C/D	0,3
E	0,4

MASONRY/ACTIONS					
	PERPENDICULAR		VERTICAL		COPLANAR
A	0,05	A	0,05	A	0,05
B	0,1	B	0,1	B	0,1
C	0,15	C	0,15	C	0,15

Tab. 1
AeDES correctives.

Tab. 2
MQI Correctives.

of vertical and horizontal elements. The structural behaviour is not ascribed to the individual structural units and therefore a knowledge of the evolution of the building clusters is essential (Greco, 2018).

As a first fundamental step for the description of the building clusters, we classified them according to their position and their shape (Fig. 4):

Linear cluster with serial fusion along a prevalent axis:

1. Along the walls
2. Double-sided with internal courts
3. With specialized buildings

Polar cluster with fusion around one or more courts

1. One court or compact
2. Two or more courts
3. With open court on path
4. With specialized buildings with several courts

Specialized aggregates with particular fusions

These categories have been designed on the historic centre of Camerino and follow what has been its evolution, however, they can be reapplied or readapted to all historic centres with similar morphology and evolution such as many other historic centres in the Marche region that have the same conformation (sandstone podium area). (Fig.4)

Currently, the buildings rarely exceed three floors above ground and the elevations, mostly without overhangs, are characterized by the clear prevalence of solids over voids. The fronts overlooking the main roads are mainly covered with plaster, the presence of which makes it difficult to define the type of historical building systems used. However,

almost exclusively from the 'minor' fronts, masonry made of pebbles and small rubbles bonded with abundant mortar can be observed, sometimes regularized using brick courses. It is possible to distinguish numerous changes made in recent times, some of which, in addition to compromising the general figurative quality of the historic centre, alter the structural behaviour of the individual buildings. We refer to the punctual elevations, to the additions, to the restorations carried out with technologies that are not very compatible with the traditional ones and to the prevailing practice of replacing traditional materials with modern ones.

A fundamental step in the analysis of the current state of the buildings is represented by the historical-typological characterization of the wall samples. This dating was mainly based on a diachronic analysis carried out by crossing historical maps and reconstructions of the evolution of the buildings. The recurring types of masonry for each historical period are shown in figure 5; the sampling was carried out in the lower areas of the buildings without plaster on the façade. A total of 44 samples were analyzed and an analysis sheet was drawn up for each. Its contents can be summarized in:

Part 1 - Location and identification of the masonry

Part 2 - Survey of the wall typology:

a. panel geometry;

b. characterization of the panel and section materials;

c. characteristics of the bedding mortar.

Part 3 - Qualitative observations and mechanical parameters. (Fig. 5)

Proceeding to analyze the masonry building as a whole, what will most affect its behaviour concerning horizontal actions will be the level of regularity and box-like nature of the building. The presence or absence of these two conditions guarantees a correct distribution of horizontal actions, the inhibition of the activation of local mechanisms and the development of global resistance mechanisms.

After the direct inspection, it can be said that the buildings in the historic centre of Camerino present significant levels of damage; these levels are analyzed through the intersection of information synthetically collected within analytical files:

a. Information from the AeDES forms for ordinary building;

b. Descriptions of the correct parameters in the construction of a wall system and that determine the MQI values (Borri, 2019) (Fig. 6).

Furthermore, information is collected on the characteristics of the cluster systems:

1. position in the urban context, to understand the possible interaction between different buildings under earthquake, the position of the buildings in the urban context must be

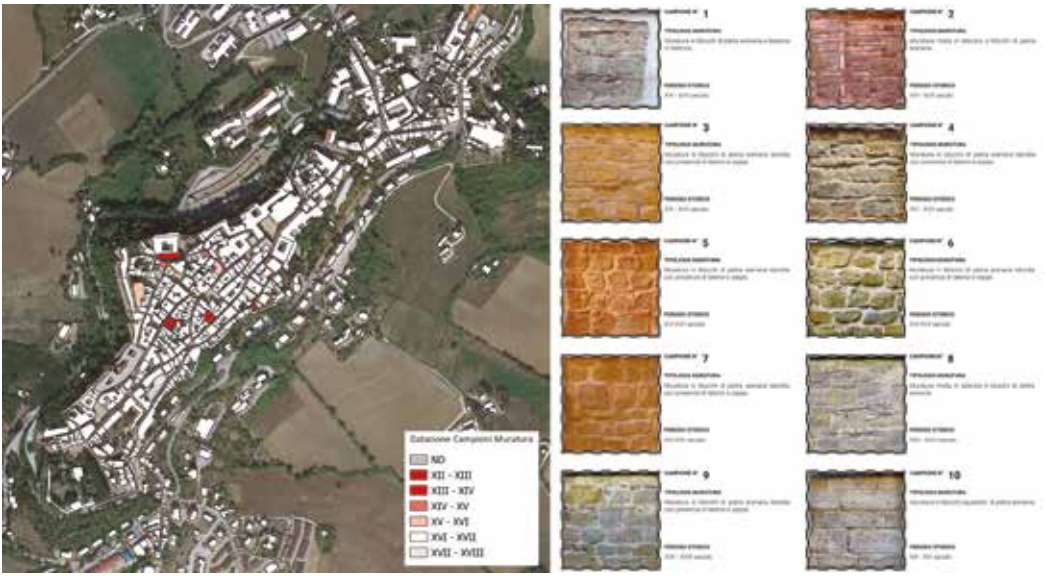

Fig. 5 Masonry typology identified on the basis of the construction period.

Fig. 6 MQI Results: Orthogonal Actions. The map shows the results concerning the masonry quality related to the orthogonal actions.

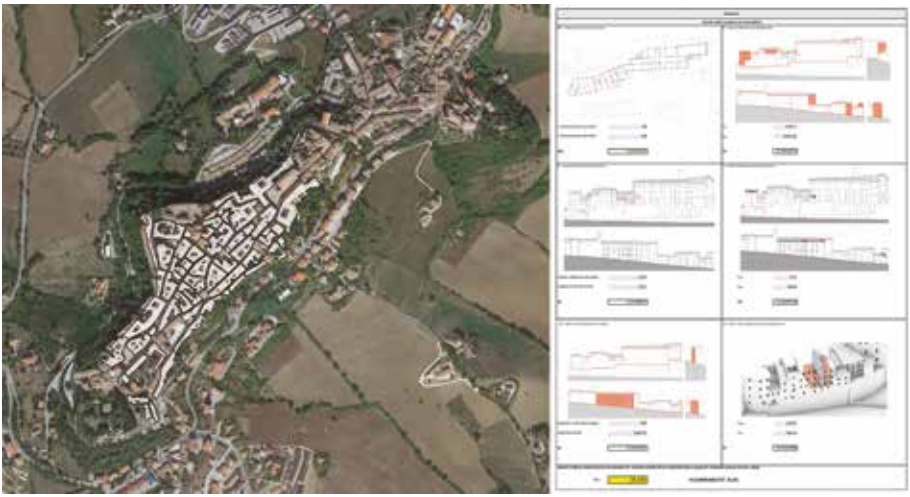

Fig. 7 Identification of the building clusters analysed and vulnerability index sheet.

Fig. 8 Identification of the vulnerability of the building clusters: from very low (blue) to maximum (red) vulnerability. This classification provides a starting point for the characterization of the fragility of the clusters.

Fig. 9
Identification of the vulnerability of the building clusters with AeDES and MQI correctives applied: from very low (blue) to maximum (red) vulnerability.

taken into consideration (isolated, adjacent/statically independent structures, in connection/structures interacting);

2. photographic documentation of the cluster;
3. volumetric reconstruction or the elevations of the entire cluster;
4. total number of storeys including any basements;
5. average storey height;
6. number of basements;
7. average storey surface;
8. age of construction;
9. prevalent use;
10. irregularities in plan and elevation

Following this description carried out for each cluster highlighted in figure 6, a methodology has been applied for the assessment of vulnerability, through partial indices relating to the constructive deficiencies detected such as disconnections in plan, vulnerability to shear forces, hammering, etc. (Mochi-Predari, 2016). (Fig. 7)

To obtain a constant and continuous control of the information, these must be collected with the help of analytical sheets, whose information is associated with a georeferenced system (G.I.S.) in such a way as to be able to query this system having direct feedback on the cartography. The graphing of the questions on the cartography allows evaluating whether within a given urban fabric there are critical areas, from the seismic point of view, linked to factors congenital to the geological zone in which they are located, to the construction types present in that urban sector, among the possible examples, the general state of conservation.
The survey of characteristic factors of the seismic behaviour of the buildings made it possible to identify one of the most vulnerable and highly damaged elements in the wall system. The materials, the installation systems and the mortars of the masonry were analysed: the result is limited use of the "rule of the art", which is linked the Masonry Quality Index (MQI) (Borri, 2019). The observation of the samples and the subsequent construction of a chrono-typological abacus of the walls present in the buildings in the historic centre allowed a careful reading of the state of affairs. For each masonry sample, an MQI was defined which separately evaluates the responses of the masonry panel for the different types of actions. In Camerino, the walls that have a higher MQI are those in squared stone (generally of medieval dating), while the walls of lower categories are more frequent, especially concerning the orthogonal actions to the wall plane. In summary, the most evident deficiencies are related to the response of the wall systems to seismic actions, as they are not able to withstand events characterized by high intensity and considerable accelerations, amplified by local factors.
The analyzes derived so far and the information obtained both from on-site observation and from the hypotheses put forward on the historical evolution of the buildings allowed us to apply a methodology for identifying the vulnerability of individual building clusters (Fig. 8). This first application on GIS has provided us with a starting point for the characterization of their fragility, to which further information relating to the levels of damage collected by the AeDES forms and relating to the sheet for the evaluation of the masonry quality index was added (Fig. 9), to be able to provide, with the data collected, a scenario that is as faithful as possible to the reality experienced. Using as a basis the map related to the vulnerability of the clusters examined, the damage described by the AeDES has been categorized according to weights gradually increasing according to the severity of the outcome as reported in tab. 1. A similar procedure was carried out for the results related to the MQI: it is clear how the quality of the masonry affects the overall behaviour of the cluster. For this reason, a correction coefficient directly related to the masonry quality index is proposed to be applied to the global vulnerability described above. This corrective coefficient takes into account the results of the MQI related to perpendicular, vertical and coplanar actions whose relative score is added to

the vulnerability index (Tab. 2), considering the masonry analysis a deteriorative condition of the behaviour overall of the aggregate. Note, therefore, that the aggregate's vulnerability index is closely related to the masonry quality and, consequently, to the type of masonry from which it is formed.

The total score was then normalized to obtain a result comparable with the one relating only to the methodology applied. The final result is, therefore, a qualitative description of the vulnerability ranging from a very low to a very high level.

These results allow us to have a general picture of the situation in the historic centre, and then to be able to compare the information obtained. As can be seen from a first comparison between the two maps shown below, the information relating to damage and masonry quality provide a more precise picture as they derive from more in-depth analysis, however, they give a worse vulnerability result than the first, probably due to the conditions associated with the individual structural units and the local parameters associated with them. (Fig. 8)(Fig. 9)

Conclusions

In formulating judgments relating to seismic behaviour, vulnerability and verifying the safety of historical aggregates, a careful reading of the data is required through integrated automatic procedures, looking for constant feedback in the characteristics and the actual state of each specific artefact.

The analysis of the typological-structural survey on the clusters allowed the identification of a series of effective vulnerability characteristics common to the buildings located in the historic centre of Camerino. Through the considerations inherent to the morphology of the aggregate, the construction quality and the transformation phases, the particular weaknesses of the buildings were identified. The in-depth studies on the knowledge of the masonry quality, of the connections and discontinuity between structural elements, have proved indispensable as they are fundamental aspects to characterize the critical elements. Finally, through the cataloguing and characterization of the actual damage, the vulnerabilities that exist on the building were taken into account, allowing also to add the local parameters relating to the individual structural unit. The study, therefore, is divided into several interrelated levels that are necessary to carry out analyzes aimed at reducing seismic risk and constructing damage scenarios that can be useful, on a territorial scale, for the possible definition of a "ranking" of the clusters based on the identified vulnerability and, therefore, of an intervention priority.

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BEYOND THE EARTHQUAKE: KNOWLEDGE FOR RESTORATION. THE CASE-STUDY OF CORNILLO VECCHIO (AMATRICE, ITALY)

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Cornillo Vecchio, Amatrice (RI). (Veronese, 2019).

Amongst the dynamics of the abandonment of historic towns in our country, those resulting from seismic events have manifested repeatedly over the centuries. Not least was the earthquake which struck L'Aquila and Central Italy in 2016, pitting the scientific community against several emergency scenarios whereupon the need emerged to consider how to reconstruct the destroyed heritage.
Cornillo Vecchio, one of the 69 hamlets of Amatrice in the province of Rieti, represents a symbolic case, whereby the earthquake of August 24th 2016 and those of the following days almost entirely destroyed the inhabited historic centre, leading to its complete abandonment. Along with L'Aquila and Amatrice, the town of Cornillo was the focus of a study workshop organised by the Federico II University of Naples School of Specialisation in Architectural Heritage and Landscape in May 2019, during which, with the scientific coordination of professors Renata Picone and Giulio Zuccaro, it became possible to better understand the condition of both the historic centre, which was almost entirely destroyed by the earthquake, and of important religious sites in the area, such as the church of Santa Maria di Filetta and the Sanctuary of the Icona Passatora in Amatrice. With the aid of advanced technology it was possible to specify the materials, constructive techniques, state of conservation and damage mechanisms of artefacts, thereby achieving a degree of understanding sufficient to develop guidelines for both urban and architectural restoration.
This paper seeks to illustrate the results of this experience, which has considered the historic town of Cornillo within its urban dimension in a critical and informed manner, with the intention of providing support to the understanding of the territory and its emergencies, thus creating a basis for the scientific approach to emergency scenarios which can benefit from a combination of different sources of knowledge and multidisciplinary teamwork.

Keywords: earthquake, knowledge, restoration, Amatrice, Italy

Historic towns and earthquakes: A field experience[1]

Within the dynamics of abandonment of the historic towns of our country, those caused by seismic events have certainly been amongst the most widespread and frequently occurring over the centuries. The earthquakes which have struck Italy, such as those which afflicted Belice in 1968 and Irpinia in 1980, and more recently that which struck L'Aquila and

[1] Although the study is the result of the coordinated work of the three authors, the first part was written by Renata Picone, the second part by Mariarosaria Villani and the third by Luigi Veronese.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Fig. 2
Cornillo vecchio, Amatrice (RI). (Veronese, 2019).

Fig. 3
Cornillo Vecchio, Amatrice (RI). (Veronese, 2019).

Central Italy in 2016, are sad pages in Italy's national history, in terms of the loss of both human life and built heritage[2].

Just as in other periods which immediately followed a dramatic event that struck our collective heritage - one need only think of the postwar periods - debate has raged over emergency scenarios and the necessity as well as the methods of reconstruction of destroyed heritage[3]. Although almost a century has now passed since the controversy over the reconstruction of symbolic monuments of our country according to the 'where it was, as it was' philosophy during the period of recovery from war damage - one might consider as an example the Church of Santa Chiara in Naples or the Ponte di Santa Trinita in Florence - even today the same dilemmas arise in situations involving the sudden loss of culturally significant buildings[4]. It is this same debate that has concerned the reconstruction of entire historic centres destroyed either by war or by the devastating earthquakes of the twentieth century[5]. A striking example of such damage is the Basilica of San Benedetto

[2] S. Gizzi, *Climate Change, Natural Disasters and Their Effect on Historic Centers, in New metropolitan perspective. Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition*, a cura di C. Bevilacqua, C. Calabrò, L. Della Spina, Vol. 2, Springer, Berlino 2020, pp. 1928-1938.

[3] S. Gizzi, *Climate Change, Natural Disasters and Their Effect on Historic Centers, in New metropolitan perspective. Knowledge Dynamics and Innovation-driven Policies Towards Urban and Regional Transition*, C. Bevilacqua, C. Calabrò & L. Della Spina (eds.), Volume 2, Springer, Berlin 2020, pp. 1928-1938.

[4] C. Brandi, *Il vecchio e il nuovo nelle antiche città italiane*, in "Quaderno ACI", n°21, Turin 1956, pp. 15 – 33, republished. In ID., *Terre d' Italia*, Vittorio Rubiu (ed.), Bompiani, Milan 2006, pp. 31 – 54; *Gli architetti moderni e l'incontro tra antico e nuovo*, (Venice 23rd – 25th April 1965), in "Archicollegio" (Bergamo), nn° 7 – 8; *Gli architetti moderni e l'incontro tra antico e nuovo*, 2nd National Conference on the theme, Florence 7th – 9th January 1966; R. Picone, *Il difficile dialogo tra antico e nuovo nei tessuti storici*, in *Yearbook 2008*, Master in *Progettazione di eccellenza nella città storica*, F. Izzo & A. Sirica (ed.), Paparo ed., Naples 2008, pp. 45 – 47; R. Picone, *Lo spazio del progetto contemporaneo nel restauro urbano. Il caso Napoli*, A. Aveta & B. Marino (ed.), ESI, Naples 2012.

[5] E. Vassallo, *Centri antichi 1861-1974, note sull'evoluzione del dibattito*, in 'Restauro' n.19/1975; M. De Benedetti, *La questione dei centri storici e il recupero del patrimonio edilizio in Europa*, CLUP, Milan 1979; L. Fusco

in Norcia, which was founded in the thirteenth century, according to the tradition of the birthplace of Saints Benedict and Scholastica, and which largely collapsed following the violent earthquake of October 30th 2016.

Alongside the great architectural monuments which touch the collective imagination most profoundly, as a result of attracting large numbers of visitors and often, in the case of the churches of central Italy, religious tourists and pilgrims, the most serious damage also affects the small historic towns, often medieval in character, erasing individual houses and the urban fabric. Cornillo Vecchio, one of the 69 hamlets of Amatrice in the province of Rieti, and located between the river Tronto and the Monti della Laga within the boundary of the protected area of the Gran Sasso National Park, is a symbolic case. The earthquake of August 24th 2016 and those of the following days almost entirely destroyed the residential areas, fortunately without fatalities. Nevertheless it led to the total abandonment of the hamlet which dates back as far as the late 10th century, when wealthy nobles of the Terre Summatine, of which Cornillo Vecchio was a part, donated several surrounding territories to the Abbey of Farfa.

Along with L'Aquila and Amatrice, the town of Cornillo was the subject of a study workshop organised by the Federico II University of Naples School of Specialisation in Architectural Heritage and Landscape in May 2019, during which, under the scientific coordination of professors Renata Picone and Giulio Zuccaro, it was possible to more closely study the condition of both the historic centre, which had been almost entirely destroyed by the earthquake, and of important places of worship in the area such as the church of Santa Maria di Filetta and the Sanctuary of the Icona Passatora in Amatrice. With the assistance of advanced instrumentation (drones, thermal imaging cameras, endoscopes and 3D surveying) it was possible to detail materials, construction techniques and the state of conservation and damage mechanisms of the buildings, thereby providing reaching a level of knowledge useful for developing guidelines for the restoration intervention both on the urban and architectural scale.

This paper aims to illustrate the results of this experience, which took a critical and conscious look at the village of Cornillo Vecchio in its urban dimension, with the desire to provide support to the knowledge of the territory and its emergencies, and to lay the foundations for a scientific approach based on emergency scenarios that would benefit from the combination of different sources of multidisciplinary teamwork.

Girard, *La legge 457 e la tutela del patrimonio storico-architettonico*, in 'Restauro' n.41/1979; G. Miarelli Mariani, *Restauro urbano: un ponte fra sviluppo e conservazione*, in 'Quasar' n.23/2000.

Fig. 4-5
Cornillo Vecchio, Amatrice (RI). (Veronese, 2019)

The study carried out by the students of the Federico II University of Naples School of Specialisation at L'Aquila and Amatrice, in addition to providing support to the understanding of the territory and its emergencies, has reaffirmed the importance of fieldwork, particularly as a component of tertiary education which aims to train students and professionals who are prepared to take on the challenge of intervening on non-renewable heritage which, with full awareness and responsibility, belongs to the collective memory.
From this point of view, the study illustrated here represents a double challenge. Firstly by making a necessary cognitive upgrade in the field of architectural restoration, by addressing the issues of static instability directly *in corpore vili*, making use of the latest developments in technology to support the analysis and investigations conducted on site, and secondly by seeking to bridge the gap between education and profession. Furthermore, the methodological approach to the restoration project is also changing, by increasingly becoming the result of choices that are substantiated by the results of the application of different professions.

From earthquake to intervention: A historical-regulatory framework

Seismic events represent a radical upheaval of normal life in the places which they strike. An earthquake affects both the private sphere of living, entering individual family dimensions, and the public sphere of living and social life, sweeping away the squares

where people mingle, the churches where people gather and the streets where people meet. While Sir Charles Francis Richter, inventor of the eponymous seismic scale which measures the magnitude of an earthquake, stated that "only fools, liars and charlatans predict earthquakes", his Italian colleague Giuseppe Mercalli, creator of the scale that measures the macroseismic intensity of an earthquake through the observation of the damage and the environmental changes that it produces, saw the topic from a more pragmatic point of view. In the aftermath of the 1908 Messina earthquake, he argued that "seismology does not know when, but it does know where disastrous earthquakes will occur, and also knows how to grade the seismicity of the various Italian provinces, so it would be able to indicate to the government where more or less rigorous building regulations would be needed, without waiting for the earthquake to first destroy those towns which we wish to save". It was a farsighted vision concerning a theme that is still relevant and unresolved today, following the tragic events that rocked Italy, from Belice[6], to Irpinia[7], and Abruzzo[8]. In this sense research has taken a significant step forward in recent years[9]: on the one hand, seismography has indeed made a detailed seismic classification of Italian territory, while on the other hand Italian legislation, through the 2008 NTC (*Norme Tecniche per le Costruzione*, or Technical Rule for Construction) and subsequently in 2018, has resulted in stricter guidelines on making new buildings compliant. However, the field concerning built heritage is more complex, and complicated and rough new scenarios have often arisen as a result of differentiating between adaptation and seismic improvement.

Starting with a consideration of the critical factors of built heritage, such as high vulnerability (not just seismic) and the difficulty in defining general rules of verification and design - being in most cases examples of structures built in masonry, a highly heterogeneous

[6] *Il terremoto della Valle del Belice*, in 'Trapani-Rassegna mensile della Provincia', Year XIII, n.3-4, 1968; A. Mizzau, *Recupero dei beni culturali, legislazione attuale e proposte di intervento*, in the Proceedings of the conference on the problems of reconstructing the historic-cultural heritage of Friuli and the recovery of historic centres - Cividale 21st November 1976, Friulian graphic arts, Udine 1977;

[7] A. Giusto, *Il terremoto del 23 novembre '80, la legislazione, il danno*, in A. Giusto, *Quella sera c'era una luna luminosa*, Cecom snc, Bracigliano 1993; AA.VV., *Campania, oltre il terremoto: verso il recupero dei valori architettonici*, Naples, Typographic Art, 1982; C. De Seta, *Dopo il terremoto, la ricostruzione*, Laterza, Rome 1983; Ministry of Culture, *Dopo la polvere. Rilevazione degli interventi di recupero (1985-1989) del Patrimonio Artistico-Monumentale danneggiato dal terremoto del 1980-1981*, Volume I & Volume II, State Mint and Polygraphic Institute, Rome 1994; N. Savino, S. Belfiore, R. Gialanella & M. Grasso, *Un terremoto lungo un quarto di secolo. Soldi, ricostruzione e sviluppo. Storia e sfide dell'Irpinia*, GBGS ed., Naples 2005; C. Iterar, *Ricostruzione/Rifondazione dei centri dell'Irpinia dopo i terremoti storici di epoca moderna*, Kappa Editions, Rome 2011.

[8] D. Fiorani, A. Donatelli, *Restaurare e ricostruire: Problematiche del doposisma aquilano*, in 'Tafter Journal. Esperienze e strumenti per cultura e territorio', 1st August 2012.

[9] For the evolution of seismic regulatory framework, please see: B. Valente (ed.), *L'esperienza internazionale per la conservazione dei beni culturali nelle zone terremotate: aspetti giuridico-amministrativi*, in 'Restauro' n.28/1976, L. Landolfo, *L'evoluzione della normativa sismica*, in 'Costruzioni metalliche' Year LVII, January-February 2005, pp. 54-66; A. Giuffrè, *Cento anni di norme sismiche*, in 'Seismic engineering', Year IV, n.2, Patron Editore, Bologna 1987; E. Giancreco, *La normativa sismica: tappe e prospettive*, in E. Giangreco, Fondamenti di Ingegneria sismica, Edizioni Tipografia Negri, Bologna 1983.

and anisotropic material - the 2008 NTC introduced the concepts of adaptation, improvement and local intervention, also for non-seismic activity. Aware of the difficulty of understanding and modelling articulated and stratified structures, such as historical masonry buildings, the 2008 NTC provided for the use of methods of analysis and verification dependent on the completeness and reliability of available information and the use of adequate 'confidence factors' during safety checks, which modify the parameters of capacity according to the level of knowledge of the building with regard to its geometry, construction details and materials. The 2018 update, while not changing the basic principles of the existing general provisions, introduced stricter verification requirements for masonry structures (which constitute most of the historical buildings of our country) by modifying the structural factors for such buildings, in consideration of the presence of very thin layers of mortar (with a thickness between 0.5 mm and 3 mm) - as a result of being made this way or the consequence of pulverisation within the masonry walls - and by the introduction of confined masonry, the design of which requires reference to Eurocodes UNI EN 1996-1-1.

These criteria, with specific attention to buildings with cultural value, have been transposed into the 'Guidelines for the assessment and reduction of seismic risk of protected cultural heritage, with reference to the 2008 NTC' drawn up by Mibact (the Ministry of Cultural Heritage and Tourism) which came into force in 2011, detailing the 2008 regulations introducing the SLA (Limit State of Damage for Artistic Heritage), the Category of Relevance and the Category of Use applied to cultural assets, defining the Level of Knowledge (LCi) and the Level of Evaluation (LVi) as mechanisms which incentivise the acquisition of knowledge. The 'path of knowledge' cited by the Mibact guidelines methodologically constitutes a structured cognitive approach to the building that is based on a functional characterisation of both the building and its spaces, as well as on the geometric survey, and on the historical analysis of the events and interventions which have been undertaken, to be integrated with the construction materials analysis, the state of conservation and the mechanical characterisation of the materials and the soil. This procedure forms a fundamental prerequisite for drafting the conservation project of the historical building, allowing the proposal of *ad hoc* solutions that seek to preserve the physical and material consistency of the historic building.

As often happens, a seismic event promotes the in-depth study and advances in research,with implications for current legislation. In fact, a further step forward, occurring just after the seismic events in central Italy, came with the study conducted by the MIT-MIBACT Joint Commission (Update of the Guidelines for the assessment and reduction

of seismic risk to cultural heritage) which set itself the goal of "reconciling and integrating the needs of conservation and active protection, with those of security and public safety, and the economic and environmental sustainability of the interventions", affirming and detailing some of the indications already outlined in the previous Guidelines of 2011.
Finally, an even more effective tool is provided by the "Methodological and technical guidelines for the reconstruction of the cultural heritage damaged by the earthquake of the 24th August 2016 and subsequent ones" which, acknowledging the previous indications, made an important advance with regard to interventions on historic centres as complex and stratified systems. In fact, these guidelines sanction "the awareness of the overall value of historic centres and scattered settlements, a balance that reconstruction must respect by improving the conditions to ensure people can recover safely, in continuity with previously, and better than before, regarding lifestyle habits and activities". Hence there are several recommendations for reconstruction, which is obviously preferred *in situ*, "on the historicised ground through the recovery of urban balance between full and empty spaces, of constructed volumes and areas for public and private use, and as as far as possible with ancient materials".
The intervention methods indicated in the guidelines are those of complete reconstruction "in compliance with the values of the pre-existing building (from a volumetric, spatial, morphological, material and structural point of view, as well as the relationships between voids and solids), implemented in various permutations, ranging from the analogical, formal and constructive to the critical-interpretative". The vagueness of the latter indication, however, results in a high degree of uncertainty, opening the door to a wide range of possible scenarios - from mimetic to innovative reconstruction - that are highly variable and dependent upon the available professional skills and even more on the sensitivity of the technician selected to restore the built heritage.
Finally, besides the technical indications, the guidelines encourage and favour specific training of the workers, recognising specialist knowledge as an essential asset for the success of the intervention. The tertiary specialist training provided by the Schools of Specialisation in Architectural and Landscape Heritage is also part of this perspective, providing architects and engineers with the tools and disciplinary insights necessary to operate on the built heritage, as are experiences on site such as the ones described in the present paper.

The case of Cornillo Vecchia: An experience in the field

The workshop organised by the Federico II University of Naples School of Specialisation in Architectural Heritage and Landscape, held in L'Aquila and Amatrice in May 2019 under the scientific coordination of professors Renata Picone and Giulio Zuccaro, and with the

tutoring of architects L. Veronese, L. Cappelli, E. Fiore and S. Iaccarino, gave the students - both architects and engineers - of the Neapolitan School of Specialisation the experience of confronting the post-seismic scenario of an abandoned village located in the area of the crater of the earthquake in central Italy.

As is well known, the Amatrice-Norcia-Visso seismic sequence of August 24th 2016, with its epicentre along the Tronto Valley, had a devastating impact on the built heritage, reducing entire villages to rubble. Among those destroyed were Accumuli and Amatrice in Lazio, and Arquata and its hamlet of Pescara del Tronto, in Marche. The seismic swarm irreparably damaged the multitude of historic small villages and hamlets which characterised the area of the upper Tronto Valley, causing its total abandonment in the aftermath of the earthquake. This phenomenon was exacerbated by the conformation of the land and the extensive damage to the communicating roads which made it difficult to reach these small towns in the earliest hours of the emergency, slowing down the first aid and rescue operations and swiftly transforming these places into ghost towns.

The goal of the workshop, which was divided into three days of practical-operational study, was to critically and technically analyse the places and buildings destroyed by the earthquake, utilising previous knowledge to identify the conservational problems and signs of crisis. This synthesising process is necessary in order to be able to understand (and correctly develop) the *modus operandi* and actions of the technicians who operated on the site in the aftermath of the earthquake. Considering the great educational value of experiential teaching for expanding the knowledge base of already-trained professionals, such as postgraduate students participating in tertiary education, this workshop represented a unique opportunity to retrace and study the affected areas of the earthquake in controlled areas whose history, identity and urban vitality were frozen by the tragic event.

The workshop, assisted by technicians from the Civil Protection Department, the Plinius Center and the Architecture Department of Federico II University, focused on the hamlet of Cornillo Vecchio, a historic centre that was entirely destroyed by the earthquake, and on important places of worship which were severely damaged in the Amatrice area, such as the church of Santa Maria di Filetta[10] and the Sanctuary of Icona Passatora[11]. For these structures it was possible - with the aid of digital instruments (drones, thermal imagers, endoscopes and 3D surveys) which allowed a deeper diagnostic investigation - to

[10] C. Verani, *Gli Affreschi di Pier Paolo da Fermo nella chiesa di Santa Maria della Filetta vicino all'Amatrice: appunti su un pittore finora sconosciuto*, Faraoni, Rieti 1955.
[11] A. Di Carlo, *Monografia storica del santuario di Maria SS. delle Grazie detto d'Icona Passatora in Ferrazza (Amatrice)*, Tipografia Ascolana, Ascoli Piceno, 1908.

develop guidelines for the restoration of this heritage, combining the needs of preserving the specificities observed with the requirements of structural safety.

The first two days were characterised by inspections in the Amatrice area and compiling a draft of the damage and accessibility forms in the seismic emergency (*Aedes* and Churches), and made it possible to conduct a census of the effects of the earthquake on elevated structures, particularly in historic villages.

By observing and climbing over the rubble, it was possible to gain direct experience of the effects of the earthquake on the structures by analysing the mortars, which in many cases crumbled under the slightest pressure from the fingertips, to analyse the materials lying *in situ* and to receive training in the reading of the wall joints, from which it was possible to deduce the techniques and construction methods typical of the area[12]. After this initial operation, starting with observation of the damage, the students were able to analyse technical errors and design deficiencies - such as the absence of jack arches and spreader beams, and the choice of local building materials, which were qualitatively poor and not suitable for the construction system adopted - which amplified the destructive effects of the earthquake. Direct assessment of the buildings was carried out with the support of advanced diagnostic instruments such as 3D laser scanners, thermography, endoscopy and drone flyovers, allowing us to analyse the building units that made up the architecture of Cornillo Vecchio, the church of Santa Maria di Filetta and the Sanctuary of the Icona Passatora in depth and at various scales of detail, providing the opportunity to quickly develop a comparative study on the response of these structures to seismic action and, thereby, to identify compatible restoration and structural consolidation interventions compatible with traditional construction techniques capable of guaranteeing high safety standards in the event of an earthquake.

The assessment survey saw the students involved in a series of inspections which sought to analyse the patterns of cracks and kinematics present on the structures, examining the possible damage mechanisms that could have been activated in the studied areas, and extended to all structures that could be safely viewed and, in conditions of evident danger, to report the unusability of the structures and assess the need for temporary works.

This activity was accompanied by the completion of the *Aedes* form – used by the Civil Protection since the Umbria earthquake of 1997 and in all subsequent events – to analyse the damage, define the necessary emergency measures and evaluate the post-seismic safety standard compliance of residential or service buildings with traditional structural typologies

[12] M. Morandi, *Le case di terra nel territorio abruzzese: diffusione, tecniche di realizzazione, l'abitare*, *Comune* of Pescara, Pescara 1986; AA.VV., *Le tradizioni del costruire della casa in pietra: materiali, tecniche, modelli e sperimentazioni*, Università degli studi dell'Aquila, Department of Architecture and Urban Planning, Alinea, Florence, 2009.

Fig. 6
Sanctuary of Icona Passatora, Cornillo Vecchio, Amatrice (RI). (Veronese, 2019).

(in masonry, reinforced concrete, steel or wood). However, it was not possible to apply this system of surveying to all buildings in the same way, since some structures, such as churches and monumental buildings, required specific and dedicated forms.

This was the case of the 'Church form', which was drawn up during the survey of the Sanctuaries of Santa Maria di Filetta and Icona Passatora, where the inspection was aimed at guiding future 'specialised technicians' to recognise the specific collapse mechanisms that can be observed in such structures.

In addition to assessing the condition of the structure and the possible need for provisional works in order to protect public safety, the operations for surveying damage in churches were aimed at avoiding, in the event of new seismic events, further damage to the structures and to both movable and immovable heritage contained therein. A particularly critical case was represented by the conservation of the frescoes and decorated surfaces present in the Sanctuary of Icona Passatora, where the post-earthquake safety measures provided for a pre-consolidation by means of the *velinatura* method, or the application of protective layers which, while avoiding the material loss of frescoes, causes conservational criticalities to manifest over time due to the temporary nature of the operation, and prevents the frescoes from being viewed properly.

Fig. 7
Church of Santa Maria di Filetta, Cornillo Vecchio, Amatrice (RI). (Veronese, 2019).
Fig. 8
Cornillo Vecchio, Amatrice (RI). (Veronese, 2019).

The experience of the students of the Naples Specialisation school in L'Aquila and Amatrice has, in addition to providing support to the knowledge of the territory and its built heritage, reaffirmed the importance of on-site experiments - by coming into direct contact with the innumerable and variable responses of built heritage to the effects of the earthquake - above all in tertiary level teaching which aims to train scholars, officials and aware professionals, who will have to take on the planning responsibility for non-renewable heritage that belongs to the collective memory.

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TRACES OF HISTORY IN THE SEMI-ABANDONED VILLAGES HIT BY AN EARTHQUAKE: ELEMENTS FOR A CONSCIOUS RESTORATION

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Aerial view of Casentino (L'Aquila province, Italy) (source: Carocci et al. 2010).

The article focuses mainly on villages that are abandoned or semi-abandoned as a result of an earthquake. The problem of abandoning some Italian villages, located in inland areas and therefore less attractive for tourism, is evident and has been under study for some time. However, the historic villages in seismic areas are among the most fragile elements of this system. Often, in fact, the earthquake accelerates and emphasizes a process already underway for some time: the progressive abandonment. The issue of the abandonment of ancient villages, in this context, is strictly connected to the possibility or not of guaranteeing their safe use; only by achieving this last goal is it possible to preserve them. Securing the structures of the village is therefore an indispensable prerequisite for use; the use, on the other hand, is a condition for the material conservation of the village itself. This last step, however, is not obvious; in order to achieve good material conservation, detailed knowledge and some caution is required. There are in fact specificities and peculiarities that need to be taken into account in the analysis of these villages. What elements are also important for an effective static analysis of masonry and what changes if they are individual parts of autonomous building units or if they are parts of structures linked to each other? What elements are useful for a good understanding of the collapse mechanisms of masonry? And what elements of good historical practices are to be taken into consideration for a real conservation of the material consistency of these villages? Is it possible to combine static safety, good use and fruition with the conservation of the villages themselves? These are some of the questions that we tried to answer with a first research started following the earthquake of 6 April 2009 in L'Aquila carried out by the research units of the Faculty of Architecture of Syracuse, the University of Genoa and the CNR-ITC and continued in subsequent years. A multidisciplinary analysis was then carried out on the individual building and the village with the aim of reaching an overall interpretation of the various aspects that contribute to the stability of masonry built with traditional historical techniques.

Keywords: Conservation, traces, history, restoration, architectural archeology, earthquake

Traces of history and elements for a conscious restoration:

The terms "traces of history " and "conscious restoration" are two closely related elements. This article will show how a conscious restoration can be achieved through the reading of its historical traces. We believe his assumption is true both for a historic building and a multi-layered architectural complex, but it is even more appropriate while dealing with an entire historic village or even a whole seismic area. In particular, in this article we want to deepen the role that the high archaeological analysis had (horizontal and vertical stratigraphic analysis

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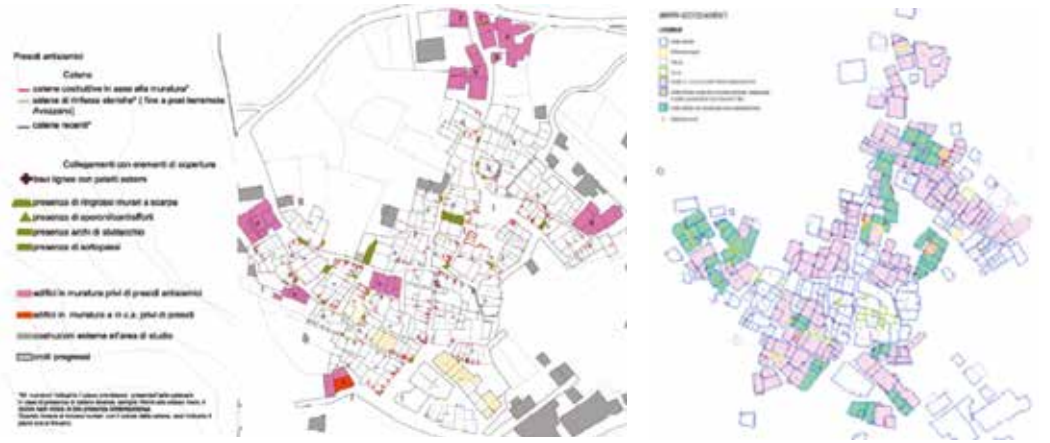

Figs. 2a - 2b
Left: Thematic map relating to the presence of anti-seismic devices. Right: Thematic map relating to the study of the different evolutionary phases of the aggregates (source: Carocci et al. 2010) Amatrice (RI). (Veronese, 2019).

of individual buildings, analysis of masonry techniques, mineralogical petrographic analysis of mortars) applied to the walls of the various units of a village. This analysis proved to be extremely useful as it highlighted the different phases of construction, abandonment and partial reconstructions which also occurred at different times and as a result of different seismic events that occurred over the centuries in these areas. This was useful not only for a good understanding of historical events but also for the structural analysis of the walls themselves, highlighting the criticalities and weaknesses of the structures and thus allowing a more conscious drafting of the guidelines laid down for their material conservation. So, we can say: traces of history to recover in order not to lose the historical memory of the village, its material and immaterial heritage; historical traces to better understand the statics of buildings and therefore to design conscious restorations even from the structural points of view (Boato, Pittaluga 2000).

Casentino example:

Repair interventions, seismic improvement and reconstruction - necessary for the recovery of functionality and safety and at the same time for the conservation of the residential buildings of centers affected by a seismic event - cannot be separated from a phase of preliminary and careful study of the building typological aspects, its construction schema and the way it got damaged. This concept was applied to the study of the town of Casentino, an historic center hit by the L'Aquila earthquake of 6 April 2009 (Fig. 1). On that occasion, a "Code of Practice" was prepared that could guide the recovery interventions on the entire village. This Code of Practice, on the one hand, kept in mind the

characteristics of the local Casentino building and, on the other hand, complied with the new Technical Standards for Construction. Therefore, systematic data collections and analyzes were carried out, which form the basis for the interpretation of the state of damage present and for the consequent setting of the intervention criteria. In particular, the methodology used envisaged an articulation in three sequential phases: the cognitive phase, the interpretative one and finally that of defining the intervention criteria. Focusing in particular on the cognitive phase, the article describes the methodology adopted and the tools designed to carry out the systematic collection of data on the behavior of buildings in aggregate. In this severe situation, issues relating to conservation, safety and functional recovery were the key ones. The starting point for the formulation of any tool, aimed at defining the most appropriate criteria for the repair, seismic improvement and reconstruction interventions to be adopted, can only consist in a preliminary and careful study phase. It is this phase that in fact guarantees the indispensable and appropriate contextualization of more general knowledge on the seismic response of historical buildings acquired, for example, from the analysis of previous events. As regards the field analysis, it was structured as follows: 1) systematic collection of data on the behavior of buildings in aggregate and 2) correlations that can be established between the observed damage, the state of conservation, the local construction technique and the historical-evolutionary phases of the building fabrics (Fig.1)

"Knowledge" phase:

This phase can be divided into two distinct parts: 1) survey of building units and blocks 2) analysis of the local construction technique. The first involves the survey of the typological aspects, of the constructive characteristics and of the damage to the scale of the single block (and more specifically, for each block, to the scale of the single building unit); the second, after the systematic examination of the collected data, is followed by specific in-depth studies for the elaboration of recurring examples of the individual construction elements and assemblies that characterize the local construction of the vertical and horizontal load-bearing structures, of the recurrent interventions carried out and of the anti-seismic devices installed).

Survey of building units and blocks.

The preliminary organization of the field surveys was carried out on the basis of the basic cartographic documentation available, in particular the regional technical map (CTR, scale 1: 5000), integrated with some information acquired from available aerial shots. After the survey of the blocks, the "map of the Building Units (B.U.)" was drawn up (Figs 2 a, 2b).

The survey of each block was carried out in the manner described below, using a two-step, progressive in-depth approach. In a first step, a survey was carried out exclusively from the outside, through the creation of campaign sketches, annotations and acquisition of photographic documentation, proceeding with the following purposes and activities:

1. schematic survey of all the street fronts of the block with evidence of injuries, collapses, chains and other anti-seismic devices: this operation is aimed at providing an accurate picture of the post-earthquake state of affairs;
2. survey of the apparent number of floors on each street front: this operation is aimed at the reconstruction of the consistency in elevation of the block;
3. identification of the positions of the walls orthogonal to the front: this operation is aimed at reconstructing the planimetric configuration of the block, identifying the individual wall cells;
4. notes on the phases of evolution and transformation of the building body through the highlighting of juxtapositions and / or clamping between the walls;
5. notes on historical anti-seismic devices where any, construction peculiarities or evident traces of recent structural interventions;
6. realization of a systematic photographic documentation of the post-earthquake state

The set of such information collected in the field and the planimetric and volumetric reconstruction of the block support the identification of all the B.U. that make up the block. In fact, based on the information in the regional technical map and orthophotos, it is only possible to carry out a preliminary identification of the B.U., which sometimes doesn't' correspond to the housing units or the cadastral subdivision, which must then be verified in the field, for example on the basis of the traces found of the subsequent transformations undergone by the aggregate. The B.U. identification obtained in this phase of external analysis could be subject to further revisions resulting from subsequent levels of study as internal surveys, detailed historical studies of the evolutionary phases of the village, etc. The identification of the B.U. represents a fundamental step not only to allow a systematic acquisition of data but also for a consistent interpretation of the damage. For each B.U. a special "survey form" has been prepared for the systematic collection of construction characteristics information (vulnerability and protective elements) and on the damage suffered; this form includes graphic sketches, notes, photographic documentation. This form is not a consolidation of buildings recognition, it is also the vehicle for a reasoned and structured synthesis of the this technological, constructive and damage survey. In this sense, it represents a

preparatory tool for the subsequent interpretative phase. The form has three main sections:

1. general B.U. information: position in the topographical context and in the aggregate in which it belongs to, general maintenance status, total number of floors
2. constructive survey of the B.U. It includes a part dedicated to the general transformations undergone by the B.U. (presence of leaning volumes, elevations, some dimensional data) and in a part specifically addressed to the acquisition of data relating to horizontal structures and vertical structural elements. All exposed (or partially exposed) perimeter walls are identified, numbered and detected, through the appropriate field in the card, which identify the actual floor plan of the B.U.;
3. detection of the damage and the identification of the activated mechanisms (specifying the location with reference to the individual structural elements identified in the previous section of constructive significance). This section describes the structural elements affected by the damage (walls, floors, vaults, roofs, secondary elements) and the types of damage that occurred (in particular, for example in the case of walls, distinguishing between the activation of "out of plane" (with collapse due to loss of equilibrium) and ruptures due to actions in the plane (where the damage is associated with the breaking of the material that causes the loss of load-bearing capacity of the structural element).

It is important to point out that the fields on the card have been particularized taking into account the specific construction characteristics present in the town of Casentino.

Analysis of the local construction technique:

After the systematic examination of the data collected at the scale of the individual B.U. and of the blocks of the entire historic center, specific insights there are, aimed at the general extrapolation of recurring examples of local construction technique regarding individual construction elements or assemblies. A special attention was paid to the study of the masonry quality, the arrangement of the vertical and horizontal load-bearing structures, the recurrent interventions carried out and the anti-seismic devices installed. Twelve samples of masonry textures were found, considered representative of the different types found in the B.U. Each sample was cataloged, non-destructive tests were performed (sonic tests, sclerometric tests, endoscopies), for mortar and stone materials samples were taken on which further characterization tests were carried on in laboratory. In relation to the disposition of vertical and horizontal load-bearing structures particular attention was paid to those details that play an important role in the overall seismic response of the building: angle-connections, the "masonry hammers", the connections between walls and floors or roofs. The historical and

recent anti-seismic devices have been studied, where present: metal and wooden chains, spurs, shoe grills, arches of "sbatacchio". These analyses help to identify some intrinsic weaknesses of the local technique and those measures that instead favored an adequate seismic response.

Interpretative phase:
This phase is carried out starting from the correlations established between the different types of information acquired in the previous cognitive phase. Therefore, a fundamental aid tool for identifying the causes that favored the activation of some recurrent damage mechanisms or modes lies in the comparison between thematic maps designed to summarize, for example, the state of damage and the constructive global maps (configuration of the aggregates, historical evolution-transformation phases) and detail maps (construction technique, presence of anti-seismic devices, recent structural interventions). These interpretations are based on the survey forms. In this case data were entered into a GIS system (Geographic Information System) that allows the rapid creation of thematic maps. A further step of this phase is represented by the correlation between the qualitative data acquired on the masonry quality and its quantitative characterization through the mechanical parameters to be adopted in the design and verification phase. The study activity launched in the historic center of Casentino outlines a methodology for carrying out the cognitive and interpretative phases of the seismic response that could also be applied in other contexts. These phases are preparatory to the definition of intervention criteria that are contextualized to the characteristics of the local building examined from time to time. In the specific case of the historic center of Casentino, the reprocessing of the acquired data will thus provide the useful elements for the drafting of a "Code of Practice" for repairs, seismic improvement and reconstruction - necessary for the recovery of functionality and safety and at the same time to the conservation of the residential building.(Carocci et al. 2010).

Archeology of architecture and understanding of what exists.

What has been done in Casentino is the result of a new approach to existing buildings. With the Seismic Ordinance 3274 of 2003, in fact, there are important innovations in the Italian technical regulations. In particular, compared to previous regulations, there are innovations on 3 different levels: 1) knowledge and surveys, 2) calculation models, 3) intervention techniques. The importance of knowledge is clearly expressed, identifying different levels of knowledge in relation to the type and number of investigations

performed. Depending on the level of knowledge reached, the safety coefficients to be used in the tests are modified through a confidence factor (FC). Basically, a sort of reward is introduced for the investigations carried out. This approach does not guarantee, in itself, a real synergy between knowledge and structural analysis, but it represents a first concrete step. A second important aspect is the inclusion of calculation models that are more in line with the real behavior of the construction, unlike the provisions of previous regulations which required buildings to adapt to the models (Boato, Lagomarsino 2011). In this change of course the importance of knowledge of the historical structure is clear. The archaeological analysis of the elevation, with its attention to the different signs present on the walls, allows us to identify the construction and transformation phases of a building, a complex of buildings, a village. The application of this method of analysis in Casentino has made it possible to highlight some fundamental elements for understanding the instability detected and also, in some cases, the good performances shown by the ancient structures. It is necessary to be aware of the basic principles of this method; it is also necessary to adopt some specific precautions when approaching contexts as this one.

What to observe and how to observe: the architectural archaeologist's point of view.

In contexts such as that of Casentino, can we list the "observation areas" and the parts or aspects of the building to which the architectural archaeologist should devote more attention? As a general rule, all the archaeological observations are useful for a better knowledge of the building, the archaeologist must not neglect any data and must describe everything that comes before his eyes with the utmost precision and completeness; however, this post-earthquake situation, with special urgencies, requires to organize the observation on the basis of the problems or questions that must be answered now. In this case, the problem is the structural behavior of existing buildings: observation, therefore, must focus on everything that directly or indirectly influences this behavior.

Architectural archeology investigations, in general, can have different objectives:

- The analysis of a specific construction, whether simple or complex, to understand how it is and how it became such.
- The identification of "construction rules" adopted in different territories and in different historical periods.

In both cases, the next question to try to answer is whether the solutions used in the single construction or in the territory studied are (or are not) characterized by good construction quality and whether they can be considered reliable and durable, both in conditions during normal operation, and in exceptional conditions. Specifically in the study of perched

villages, such as Casentino, this way of proceeding is respected but there are also other elements of complexity. In fact, it is necessary to add another element: the aggregate, the group of building units closely connected to each other and which in some cases can even include the entire country. It is necessary to understand how some transformations include several buildings adjacent to each other and how the transformations carried out can have an influence far beyond the single building unit. It is important to understand if there is a certain homogeneity of materials, techniques and if there are (or not) links between different buildings, between different construction elements. In villages subject to repeated seismic events, we found construction elements belonging to very different chronological periods. In some cases it is decades of difference but in others even centuries. In the case of analyzes such as those carried out in Casentino, moreover, we find ourselves in a more complicated situation as, often, the interventions carried out following an earthquake in the past took place in the immediacy of the emergency, also recovering material where possible. In these areas, moreover, seismic events occur several times and therefore, it is not uncommon to have a complex stratification, with several units and with inhomogeneous materials.

What to observe for understanding the statics of the whole complex?

In simple and small constructions, the number and quality of the existing stratigraphic ante-post relations at the level of the structures is likely to be minimal. However, when a large building is built and the construction continues over a long time, suspensions and resumption phases will be inevitable; this situation produces changes in the building practice, e.g. masonry, joints but also differences in the ways of laying and equipment of the parts built in sequence. What needs to be focused on is the nature of the links existing between the different walls, between walls and floors, between walls and vaults, between walls and roof and between different parts of the same structure. It is necessary to study the interfaces, the nature and conformation of their edges and on all those "micro-stratigraphic" discontinuities typical of construction site sequences: expansion joints, waiting edges, deferred insertion of parts, progression per "pontate". These details could be neglected in other situations, but they become crucial in a situation like the one of Casentino, it is important to realize combined stratigraphic observations of the structures. Even the discontinuities of a microstratigraphy can constitute lines of intrinsic and potential weakness. In short, attention must be paid to all those areas which, having even slight solutions of continuity, could prove to be more vulnerable to seismic action. Furthermore, it is also necessary to pay close attention to the quality of the materials included in

any repairs: they must neither be of too inferior quality compared to the neighboring parts nor too superior (in this case, in correspondence with a seismic action they could lead to a "hammering" effect on materials nearby.

What, then, are the concrete elements that the archaeological analysis of elevation could bring for the purposes of static and seismic checks?

- A first attention point the evaluation of the masonry quality and the recognition of any traditional anti-seismic techniques. "Even on the occasion of the L'Aquila earthquake, the main cause of the damage was attributed, simplistically, to poor quality walls; It cannot be denied that the problem exists, but it is not even conceivable that an area so tried by earthquakes has developed a "rule of the art" for the construction of the wall faces which is absolutely deficient. Non-destructive (or slightly destructive) diagnostic investigations for the onsite characterization of masonry properties (diagonal compression on panels, flat jacks, sonic investigations, sclerometry, penetrometers) can provide useful information, but are affected by considerable uncertainties, especially in the presence of irregular masonry. It is necessary to use the typical tools of he archeology of architecture : the degree of clamping present in the building faces and between the different faces, the characteristics of the mortar (Boato, Lagomarsino 2011).
- A second theme is that of the use of stratigraphic analysis in the context of structural and seismic checks, or the development of structural analysis models that take into account the evolution of the building over the centuries (Pittaluga 2009, 185-196; Calderini *et al.* 2006; Boato, Lagomarsino 2011). "*In most cases the calculation methods analyze the building in its current state, but it is clear that for a correct evaluation of the stress and deformation states it would be necessary to take into account the construction sequence, as well as the continuity solutions present between masonry built in different stages. This can be considered in a simplified way through partial models by identifying the most likely collapse mechanisms on the basis of the weaknesses recognized by the stratigraphic analysis. There is also the possibility of performing finite element analyzes, in cases where this method can be considered reliable, which consider the temporal evolution of the construction. For example, if a buttress has been added to a building following the rotation of the wall (as a garrison), this will be less stressed than if it had been built at the same time as the construction; similarly, the stress state in the infill masonry of a previous opening will be very modest, while adopting a finite element model that considers a single construction phase, this will be more compressed, with consequent less stress in the original portions of the masonry* "(Boato, Lagomarsino 2011).

Conclusion

In conclusion, there are several good reasons to try to read the historical traces of constructive and / or transformative events present in our historic villages:

1. study the historical traces to understand the reasons for deterioration and static instability
2. study the historical traces to identify possible areas of future weakness
3. study the traces to understand the reasons for good resistances and excellent static performances
4. study the historical traces to understand the history and experience of these villages

... but the main reason is only through an accurate knowledge and understanding of these traditional ways of building, it is possible to think of real recoveries of these villages in full respect of their material and immaterial conservation.

Indeed, this approach allows a better knowledge of the historical structures and correctly manages the complexities of the historical villages. These are multi-layered contests, often the transformations and repairs in a building unit also affect the one adjacent to it. This study, continuing studies also launched in other university contexts (Fiorani 2020, Acierno 2020), considers the village as a whole and allows a determination of the risks linked to the danger of the specific territory. Furthermore, it also allows to identify in a specific territory the resources and the precautions implemented in the past. It prevents the lack of knowledge of the historical structures and their possible static reserves today producing damage by imposing invaded and hardly compatible modern consolidations on them. As Tiziano Mannoni said "*we cannot accept that our ignorance of this tradition makes us declare insecure a structure that has worked admirably for many centuries, while we do not yet know if the modern structures will have the same duration, even if we are able to calculate them, considering that very often the current underestimation of building yard practice makes them much less durable than expected*" (Mannoni 1990, p.3).

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A
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Su A
Su B
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GROUND FLOOR

KNOWLEDGE METHODS FOR THE PROTECTION OF MINOR HISTORICAL CENTRES AFFECTED BY EARTHQUAKES

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Positioning of aggregate 13, ground floor plan and elevations, images of the facades (drawings and photographs by Serena di Eusanio).

The paper focuses on the importance of knowing the building fabric of minor urban centres as this is tightly linked to the problem of keeping buildings safe, in order to prevent abandonment due to disastrous events. The study aims to identify the essential information for the characterization of the built heritage, to allow its classification on the basis of distinctive categories for knowledge and conservation purposes.
Together with the historical data that can be found in the archives - which are often very lacking for building complexes belonging to minor historical centres - an adequate level of knowledge can only be achieved after acquiring data on the geometry of the building structure, materials and construction techniques, as well as their state of conservation. The combined study of this information is essential to adequately assess the seismic risk of the urban centre, being able to assess the seismic vulnerability and therefore to develop prevention strategies. The assessment and preservation of cultural heritage are intimately connected to the innovative processes of knowledge acquisition and management.
This process is presented on a case study, as an analysis of the seismic vulnerability of some of the building aggregates in the city of Isola del Gran Sasso, in the Abruzzo region, at the foot of the Gran Sasso mountain range.

Keywords: Knowledge, seismic vulnerability, historical centres, survey, protection

Introduction

Italy is a rich territory both for important architectural artworks and for minor urban centres that characterize the historical and urban identity of the Country. These urban centres deserve special attention and protection, especially in relation to the risks of damage and collapse caused by the frequent earthquakes that affect the Italian territory.
In recent years, long and frequent earthquake swarms have affected the national territory, hitting mainly minor historical centres, which have differently reacted to the events.
Over the last 20 years, we find four seismic events that have substantially changed the appearance of a large portion of the territory and the local approach to the problem. After the 2002 Molise earthquake, which triggered profound regulatory changes in assessing the safety of the built heritage, the 2009 L'Aquila earthquake showed Italy's unpreparedness to the succession of major earthquakes. The earthquake generated about 65.000 displaced persons

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

in 95 different municipalities and an estimated 10 billion euros of damage. As far as the housing of the so-called "crater" was concerned, the safety checks showed that 48.1% was uninhabitable. The housing emergency has been solved with the construction of new neighbourhoods, but more than 10 years later many smaller hamlets are showing great delays in reconstruction, and some are left abandoned.

Three years later, a series of earthquakes hit the Emilian plain; the "crater" is made up of 33 municipalities, where 550.000 inhabitants live. There were about 42.000 evacuees and 67.000 controlled houses; about 45% of these were uninhabitable.

Finally, between August 2016 and January 2017, strong seismic events occurred in the central Apennines between Lazio, Umbria and Marche: 131 municipalities were affected, the damage amounted to almost 24 billion euros, 340.000 buildings were damaged, 600.000 people were involved; after 3 years, there are still more than 49.000 displaced people and about 8.100 live in emergency housing solutions.

On this occasion, we do not want to draw attention to the huge losses that followed these events, but rather to point out that prevention is the only possible strategy to reduce them; if this is now a shared approach, however, we must not forget the long implementation times and the complexities of this operation, which extends over the entire national heritage. In particular, the availability of rapid tools for a better understanding of the behaviour of the historical building as well as its construction and critical characteristics can speed up this process.

The approach to the knowledge of historical buildings and their vulnerability

Due to the complexity of the historical fabric, a unique methodology for the assessment of seismic vulnerability has not yet been found, so that in the last 20 years there have been many proposals based on different approaches. These can be divided, first of all, between those aiming to detect the damage that has occurred as a result of an earthquake and those aiming to formulate preventive hypotheses on the behaviour of the existing structures and the damage they may suffer.

The first category collects tools for the detection of damage and the usability in seismic emergencies, including the first level GNDT card, and the currently used AeDES card (Bernardini, 2000; Dolce et al., 2014). Their application has shown limitations related to the impossibility of describing all possible types of buildings and the variability within the same building.

Among the methods aimed at preventive damage estimation, there are the so-called *mechanical* methods, which use complex calculation procedures in order to define the presumed damage conditions, evaluating the achievement of certain limit states and safety levels. These methods are appropriate for being applied to isolated buildings, since they require a careful analysis of all the mechanical and construction characteristics; the reliability of results is rather reduced on an articulated fabric like the one characterizing most of the Italian historical centres. It is possible to carry out approximate assessments even on a large number of buildings by simplifying the modeling just to a few characteristics, grouping buildings by homogeneous types, and thus obtaining results at the territorial scale. However, no specific information is obtained for understanding damages on individual building aggregates.

Referring to the building scale, a complete overview of the main vulnerability assessment methods reported in the literature is available in (Calvi et al., 2006). Basically, two approaches are identified: the *empirical* and the *analytical* one.

Empirical methods are based on the observation of phenomena generated on existing buildings during past earthquakes and on the correlation of their behaviour with the seismic intensity, obtaining statistical functions to correlate the probability of damage at a given site with the shaking intensity. The possible outputs are a Damage Probability Matrix (DPM) (Whitman et al., 1973), or a Vulnerability Index Method (VIM) (Benedetti and Petrini, 1984). The main limitation lies in the need for a large set of multiple observations of different damages to describe the performance of the most common building types at different seismic intensities.

Analytical methods try to overcome the uncertainties associated with the empirical approach to obtain more reliable vulnerability models by combining statistical and mechanical procedures. Among these, many proposals use collapse multipliers calculated on mechanical assumptions that identify the occurrence of possible damage mechanisms for certain structural properties (Bernardini et al., 2000; D'Ayala et al., 1999). These methods are very complex, due to the number of variables involved, their uncertainty level and the ways of combining them.

Besides the aforementioned classification, other vulnerability approaches are collected in (Vicente et al., 2014). However, the Italian building heritage is made up for the most part of masonry buildings and building aggregates that have undergone countless transformations over time, often undocumented, and are built out of highly heterogeneous materials (Carocci, 2005). This makes it difficult to estimate their seismic response, in the absence of a shared method that takes this variability into account.

The proposed method is part of a larger study developed in parallel with the recent seismic events in our Country, with the aim of linking the seismic vulnerability assessment of the

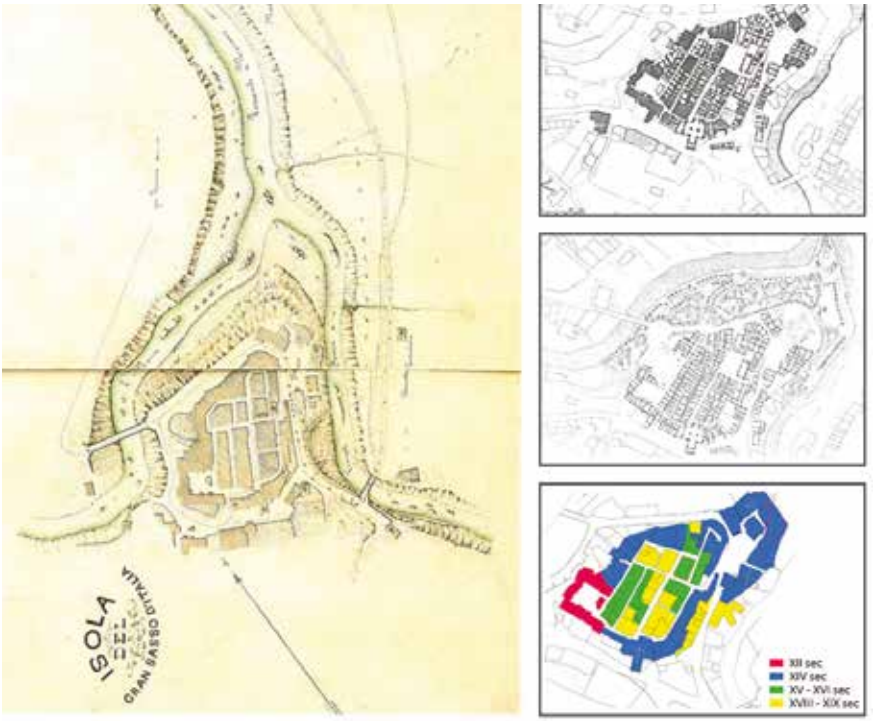

Fig. 1
Historical plans of Isola del Gran Sasso: (on the left) plan made in 1870; (on the right, from top to bottom) two different plans drawn up in the 1950s, and dating of the buildings belonging to the historical centre.

Fig. 2
Positioning of aggregate 9, ground floor plan and elevations, images of the facades (drawings and photographs by Serena di Eusanio).

existing fabric to the seismic damage that has occurred. In particular, this paper focuses on two building aggregates of the historical centre of Isola del Gran Sasso, affected by the 2009 and 2016-2017 earthquakes. The study of these two building aggregates provides interesting suggestions for the identification of direct relationships between the prior estimated vulnerability and the damage observed. Moreover, the application of the Ordinance No. 19 of the 7th April 2017, where the calculation of the so-called Operational Level (OL) is mandatory, provides a further starting point for comparison.

Isola del gran sasso d'Italia

Isola del Gran Sasso d'Italia is a small town located in Abruzzo, in the province of Teramo, at the base of the Gran Sasso mountain range (Di Eleonora, 2003); nowadays, the population consists of 4840 inhabitants and the municipal territory has an extension of about 84 square kilometres. The site is included in seismic zone 2 (medium-high seismicity).
The first certain historical information about the urban centre dates back to the XII century, when the feud of the *Isola* castle is documented, a fortress located in the highest part

of the rocky spur, where the historical centre is now situated. The fortress became a pole for the area, and the first inhabited aggregations were created, with a rational urban fabric that employed an orthogonal grid of streets. The subsequent urban expansion developed around this nucleus, but not following a predefined pattern, even if the succession in the expansion phases of the historical centre is still clearly visible in the main internal roads and the external perimeter roads, influenced by the course of the rivers and the morphology of the land.
The urban fabric is characterized by the presence of terraced houses overlooking the streets, consisting of dwellings located in the inner part of the urban perimeter, which are grouped into six distinct buildings aggregates of various sizes; on the perimeter of the historic town, the so-called "case mura" stand, consisting of buildings of different depths that follow the morphology of the site. (Fig. 1)
The two aggregates under study belong to the type of the terraced houses.
The first of these (aggregate 9) can be divided into 6 Structural Units (SUs): after the 2009 earthquake, 3 were classified as habitable, 2 as temporarily uninhabitable, 1 as uninhabitable. (Fig. 4)
The second aggregate (aggregate 13) can be divided into 4 SUs: 2 were classified as temporarily uninhabitable, 2 as uninhabitable. Both had been damaged by the 2009 earthquake.
The construction characteristics are typical of the historical buildings in central-southern Italy: rubble load-bearing masonry almost entirely in stone, with small exceptions for recent buildings

Indicator	Weight
RF	20
FP	20
DM	10
VT	15
RT	15
MCA	5
MSS	5

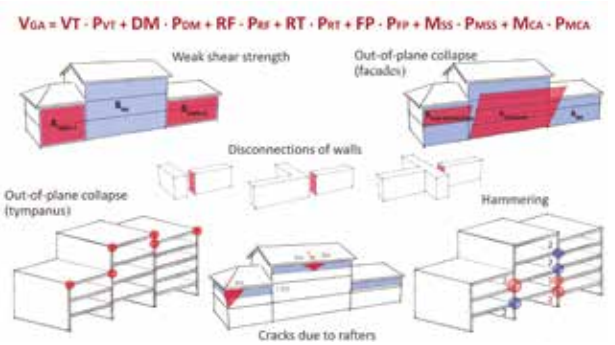

Fig. 4
In the figure, synthetic representation of the estimated indicators; in the table, weight attributed to each indicator.

in bricks or mixed masonry. The thicknesses are variable, from 70-90 cm on the ground and first floors, to 50-70 cm on the second floor and 30-40 cm in the attics. As far as the floors are concerned, we find brick vaults, hollow-brick floors, iron beams with brick vaults, sometimes thin slabs, and timber roofs; the absence of connecting beams is recurrent.
A careful inspection and on-site survey, together with the historical analysis of the building aggregates, lead to the conclusion that these developed in separate portions and reached the current layout through subsequent construction phases. (Fig. 2) (Fig. 3)

The method for the seismic vulnerability assessment

For several years, a protocol for the rapid assessment of the seismic vulnerability on masonry building aggregates has been developed by this research group (Mochi and Predari, 2016). This method is based on the determination of synthetic indicators[1] that provide a preventive quantification of the possible earthquake damage; these indicators are defined by identifying expeditious evaluation procedures based on the typical evolutionary processes suffered by each aggregate in its planimetric and height development, on the construction techniques and on the design concepts used in the local area; these aspects are directly correlated to the failure modes (Beolchini et al., 2005). This method can profitably identify the damage that can be caused by the seismic action before the earthquake occurs.
Since this is a quick assessment procedure, whose application is useful for extensive studies on historical fabrics before a detailed quantitative analysis, the work tools must derive

[1] The significant indicators regard out-of-plane collapse of the façades and of the tympanums, cracks due to the rafters, hammering due to constructive irregularities (as the presence of concrete buildings in the aggregate), weak shear strength due to insufficient width of the masonry walls, wall disconnection.

from rapid procedures, and not from complete direct surveys of the urban fabric. For the plan reconstruction of the buildings, the most recent plans belonging to the cadastral archives can be used, while the quickest and most precise choice for the survey of facades consists in the use of photomodeling.

The identification of transformation phases from the first layout of the urban fabric constitutes the starting point of the process, which leads to the current situation through the understanding of layout extensions, superelevations, demolitions and reconstructions. Understanding the transformations of the building aggregate is necessary to identify where construction criticalities can concentrate, as they are the basis for identifying the damage mechanisms that can be activated by the earthquake.

In this specific case, the greatest problems are the presence of disconnections in the edges of the walls, due to the sequence of transformation phases - and to the thrusts coming from the roofs, due to the incorrect roofing scheme. These transmit their effects on the indicators for out-of-plane collapse of entire facades or of wall corners, which are the highest for both aggregates.

Once a variable weight has been applied to each single indicator, as a function of the importance of the damage mechanism, all these values are added together to obtain a total value for each building aggregate; the entire procedure has been applied to both the selected building aggregates, obtaining a Vulnerability Index (VI) of 27.30% for aggregate 9 and 18.26% for aggregate 13. Furthermore, the vulnerability index was calculated on each SUs, in order to make even more targeted comparisons. (Fig. 5) (Fig. 6)

The peculiarity of this case study consists in the comparison between the damage that is expected through the application of the protocol and the damage actually occurred, which can be assessed through the so-called Operational Level (OL) introduced by Ordinance No. 19 of the 7th of April 2017. This defines damage thresholds, degrees of vulnerability, operational levels and parametric costs using diversified tables for masonry, reinforced concrete and mixed structures. The damage threshold is calculated on the basis of the extent and quantity of cracks, collapses, wall displacement, foundation lowering and the extent of detachments between orthogonal walls. The various conditions are listed in special tables; a single condition is enough to assign the corresponding damage threshold.

A further table includes the deficiencies of residential buildings with masonry structure, corresponding to the vulnerabilities. Each element is combined with a weight (α or β) and it is sufficient to count the number of α and β to determine the vulnerability level; the presence of a deficiency of type α is sufficient to have a significant vulnerability level. By crossing the vulnerability level with the damage state, the corresponding OL is defined, which can be L1, L2, L3, L4.

Tab.1 Comparison between Vulnerability Index (VI), Damage Index (DI) and Operational Level (OL) for each Structural Unit (SUs).

SU	VI	DI	OL
C13	54.33	1.703	L4
B13	36.42	1.539	L4
D9	33.09	1.346	L3
F9	25.73	1.029	L3
A13	18.26	0.835	L2
E9	18.61	0.792	L2
D13	20.46	0.775	L2
C9	11.22	0.418	L0
B9	19.42	0.064	L0
A9	6.67	0	L0

The research protocol intends to assign different weight values to each indicator. The weights take into account the dangerousness and frequency of the relative deficiency; the larger weights are attributed to the indices linked to the first damage mode mechanisms, while the smaller weights are attributed to the second damage mode mechanisms. It is interesting to note that in the OL the procedure is substantially similar, assigning the two weights α and β in the calculation of vulnerability; moreover, the weaknesses identified in the Ordinance include: presence of load-bearing walls of reduced thickness or double facing without bondstones; poor quality of the masonry texture; widespread absence or irregularity of masonry connections; lack of connections of floors to vertical structures; floors on staggered levels; presence of vaults or arches with non-contrasting thrust; presence of thrusts in the roof.

It is possible to highlight a close correlation between the two methods, each developed independently of the other: all the vulnerabilities identified in the protocol are also contained in the Ordinance.

Moreover, the definition of damage states is an important step for the numerical quantification of post-seismic damage. The research protocol can also be adapted to the numerical quantification of the damage suffered by a building complex through a Damage Index (DI), so that an objective comparison of different aggregates can be made on the basis of the cracks in masonry and floors. The OL damage is obtained from the analysis of the amount of cracks and their size, from lowering, detachments, and irregular walls; only one condition is necessary to attribute the relative damage. (Fig. 7) (Fig. 8)

Fig.5
Expected damage mechanisms for aggregate 9 (drawings by Serena di Eusanio)

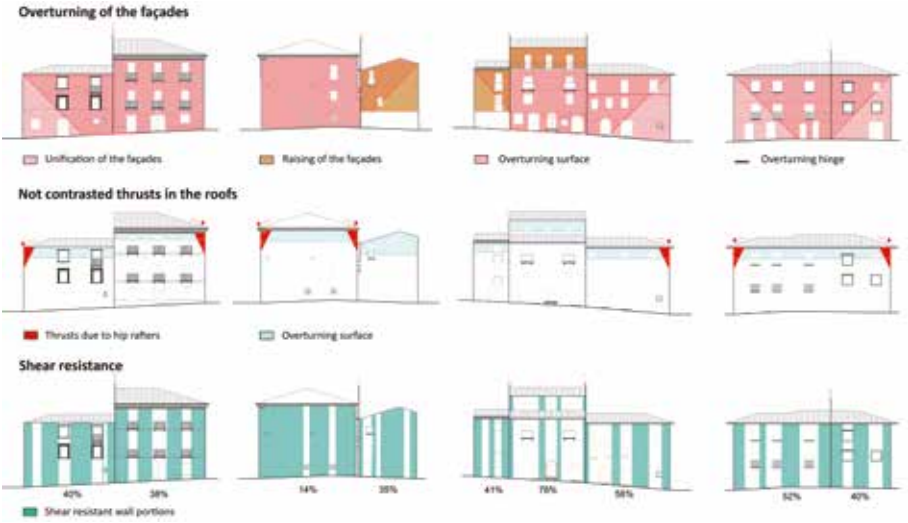

Fig.6
Expected damage mechanisms for aggregate 13 (drawings by Serena di Eusanio).

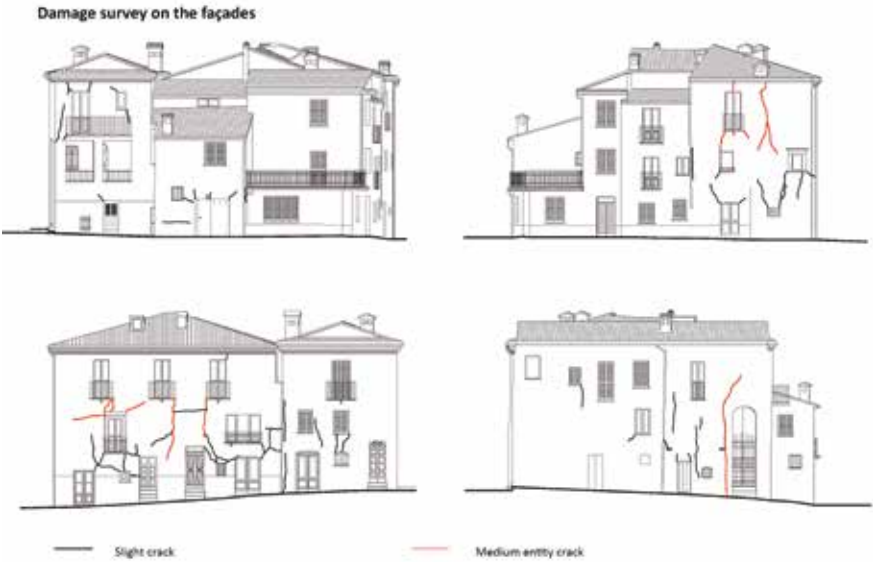

Fig.7
Damage survey on building aggregate 9 (drawings by Serena di Eusanio).

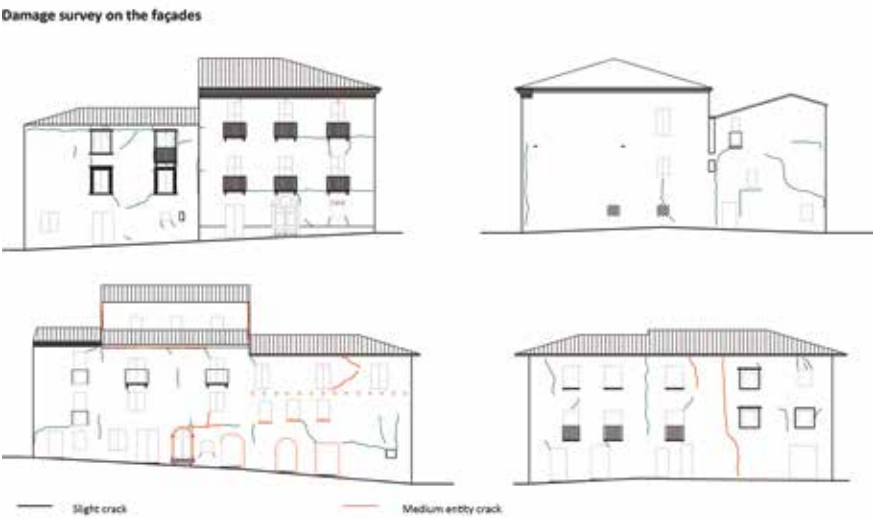

Fig.8
Damage survey on building aggregate 13 (drawings by Serena di Eusanio).

Results

The comparison between the VI and DI calculated using the research protocol with the OL shows that there are only slight differences in the evaluation, as can be seen in the following table. As a whole, the SUs with the highest vulnerability and the highest damage level estimated with the research protocol are also those with the highest OL. The only anomalies are found at particular SUs, e.g. for a staircase.

Conclusions

The results of the comparison show how the preventive identification of buildings at the greatest risk can allow the planning of seismic improvement interventions and, at the same time, avoid considerable losses of the architectural heritage, which would lead to further depopulation of contexts that are already going through critical situations, due to socio-economic transformations and changes in housing models.

An expeditious procedure such as the proposed one, essentially based on the knowledge of the historical built heritage, could allow local Administrations to obtain preliminary indications regarding the vulnerability level of building aggregates, but it can also provide a starting point for professionals, to be verified with specific and in-depth investigations on the single structural units to set up appropriate interventions with the aim of minimizing the seismic risk of the built heritage.

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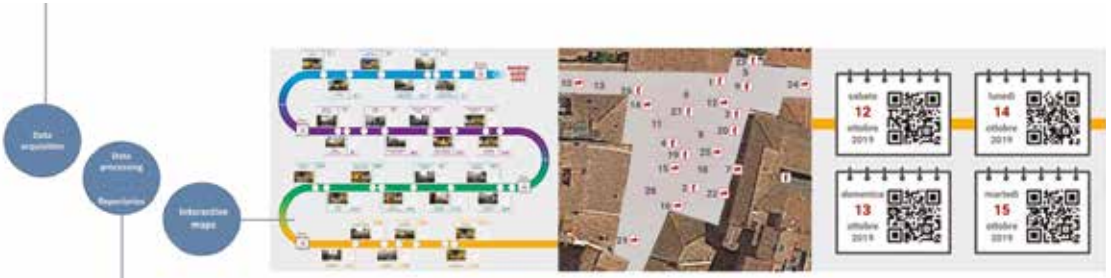
Data acquisition
Data processing
Experience
Interactive maps
sabato 12 ottobre 2019
lunedì 14 ottobre 2019
domenica 13 ottobre 2019
martedì 15 ottobre 2019

THE IDENTITY SURVEY FOR THE SUSTAINABLE ENHANCEMENT OF THE HISTORICAL CONTEXTS, SMALL TOWNS, AND VILLAGES

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Università degli Studi di Firenze-Italia

Some output from the workflow.

Strategies of valorization and revitalization of small towns and villages are nowadays the topic of many researches, and projects conceived to both enhance the understanding of the rich inheritance we received from our past and the possibility to transform such unique legacy into a sustainable social and economic development factor.
To achieve this goal it is necessary to make decisions focused on the realization of realistic interventions supported by accurate multidimensional plans of knowledge. For this purpose, analyzes should therefore be carried out capable of recording the wide range of parameters that can characterize the Italian inland areas.
In this framework emerges the need to adapt the methods and tools of the architectural survey traditionally intended to articulate it both in quantitative terms, interesting the various involved scales, and in qualitative terms, depending on the various quality dimensions of the analyzed contexts.
The case-study is represented by two hill towns located in north-western Tuscany, Gombitelli and Castelnuovo Garfagnana, respectively affected from depopulation and risk from overtourism.
Based on these premises, some experiences of identity survey were carried out on the case study, the crucial phase of which is constituted by the evolved representation interpreted as the convergence between survey data and representation models aimed to create "identity" maps.

keywords: identity survey, urban survey, townscape, Gombitelli, Castelnuovo Garfagnana

Introduction

Small towns and villages constitute a characteristic frame of Europe and Italy and are considered an important asset in cultural terms but with serious problems of livability, especially with regard to historical contexts located in inland areas, a condition that depresses their potential.
They are not only a way of preserving the memory of the past as a material heritage but are part of a large, even intangible, environment that can be projected into the future provided that the infrastructure, work, educational, cultural, well-being and social cohesion politics of the territory are linked in terms of competitiveness (Throsby 2002).
Following the pandemic emergency, a wide debate has opened in Italy on the resilience of urban systems and on the probable new relationships between larger cities and small settlements distributed in the surrounding area, seen as places where a different lifestyle can be

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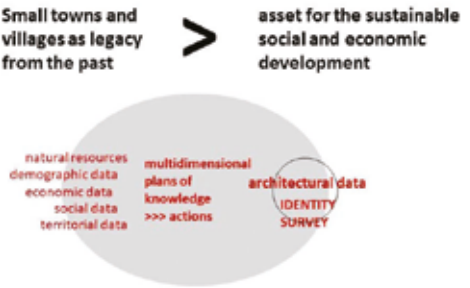
Main strategy of the study.



Goals of the Identity survey in the knowledge plans.

established; in this period different people and groups, in fact, have chosen to move from the large urban agglomerations, where the confinement restrictions were very heavy, moving to smaller settlements that offer the advantage of the small size, the sense of community, the proximity of nature allowing to live on a human scale.

This study is part of the theme of reconciling the suffering conditions of these places and the promoting of their livability of the villages by proposing the methodology of the ID survey for the documentation of the widespread built heritage in inland areas.

The study has been applied to the case study represented by two hilly inhabited centers located in north-western Tuscany, Gombitelli and Castelnuovo Garfagnana, both affected, albeit in different ways, by risks typical of inland areas.

Institutional frame

The strategies for the enhancement and revitalization of small towns and villages are today the subject of many researches, studies and projects conceived both to improve the understanding of the rich and unique heritage we have received from our past, and for the possibility of transforming it into a social and economic sustainable development factor (ASVIS 2020, Battisti 2017, (Shirvani Dastgerdi, De Luca 2018).

The theme of marginal areas ('Widespread Built Cultural Heritage") is dealt with in many international framework documents including strategic approaches to resilience which in Italy mainly refer to the various institutions that have been dealing with the problems of inland areas declining the objective of revitalizing the villages by leveraging the tools that could be implemented in the short-medium term (ANCI 2017).

In particular, the three axes of the Italian "National Recovery and Resilience Plan 2020" (PNRR 2021)- digitalization and innovation, ecological transition, social inclusion - all go in the direction of some of the actions already identified for some time focusing on the

reduction of the digital divide, on the territory safety, on the strengthening of transport systems to make families and young people come back to live in small municipalities, regarding those areas that the SNAI strategy (*Strategia nazionale per le Aree interne* 2013) defines as characterized by:

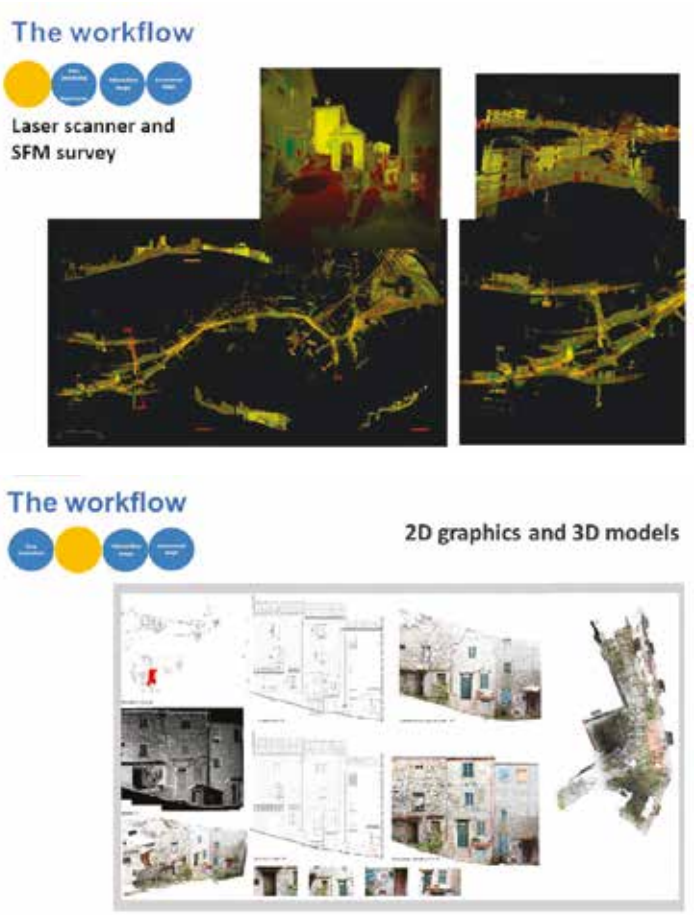
- a significant distance from the main centers of essential services (health, education, collective mobility);
- a large availability of environmental resources (water resources, agricultural systems, forests, natural and human landscapes) and cultural resources (archaeological heritage, historical settlements, abbeys, small museums, craftsmanship centers);
- complex territories, the result of natural systems and processes of anthropization and depopulation.

The revitalization of villages and inland areas therefore hinges on three axes, which require decisions focused on the implementation of realistic interventions supported by accurate multidimensional knowledge plans (Puma, Trombadore 2020).

Aim of the study

Multidimensional knowledge plans are used to guide decisions by administrators that are sustainable for communities and citizens in many social, economic, environmental but also cultural and anthropological terms. For this purpose, analyzes should therefore be carried out capable of acquiring the wide range of parameters that can characterize an area as inland: from demographic, economic and social ones to urban planning ones (useful for defining "essential service" areas), and those useful for describing the natural environmental resources of a territory, and those typically used to represent the material data of an architectural context (Penkova et al. 2017). In this concept, the discipline of urban survey can transversally support multidimensional knowledge plans by adapting traditional methods, tools

Implemented urban survey.



and outputs to articulate them both in quantitative terms, calibrating them on the various scales affected by the problem, and in qualitative terms, calibrating them on the various quality dimensions of the analyzed contexts.

The two samples of the case study were analyzed through the Identity survey methodology, which implements the architectural survey both in quantitative and qualitative terms, with the aim of adjective urban survey with the identification of the main characters of the places described also by the characteristics of interaction between people and the place, by the temporal rhythm, by the sensorial perception, by the changing physicality due to the presence / absence of its inhabitants and the use of public and urban spaces.

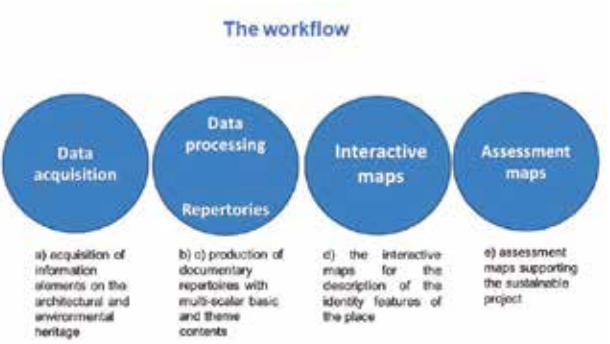
Methodology of the study

As is known and well established, the stratification of historical contexts is what produces the perceived uniqueness of a place, the specificity of each context that has the particular physiognomy of the Genius loci, the result of a combination of material characteristics of the place, of the activities that take place there, of the way we live our cities, and of the meaning attributed to that place by the inhabitants (Norberg-Schulz 1979, Forlani et al. 2017).

In general terms, "identity" refers to personal, social and cultural experience, therefore it is formed in the interaction between individuals and the surrounding world sphere: "Cultural

The conceptual model of the Identity survey methodology

The Identity survey methodology's workflow.



heritage is a set of resources inherited from the past that populations identify, regardless of who owns them, as a reflection and expression of their constantly evolving values, beliefs, knowledge and traditions. It includes all aspects of the environment that are the result of the interaction over time between populations and places through time" (Faro Convention 2005, UNESCO 2011).

Therefore the identity of the place is directly linked to the urban character, the peculiar quality of each city based on the particular urban and architectural spatial characteristics (the townscape), but also to the intangible qualities that characterize it and therefore it concerns different disciplines: urban planning, urban landscape studies, urban sociology, and the anthropology of spaces (MIBACT 2004, ICOMOS (2011).

Understanding these layers and their mutual relationship is a crucial factor for understanding urban organisms, perceiving their identity, understanding their potential and vulnerabilities.

For some years, therefore, the author has been working on the configuration of the Identity survey methodology (Puma 2018), conceived to attempt to understand and represent

the complexity of places, understood in their integrity and syncretic perception we normally experience in everyday life, and to describe it in a more integrated way able to talk about also its attitudes, load capacities, components of its resilience, its social dimensions, with the aim of supporting the multidimensional knowledge plans described above.
Focusing on the built architecture, the Identity survey focuses on a methodology of analysis and reading of contexts centered on the specificities and implicit potential of historical places that favors the expression and emergence of the Genius loci of a space or a territory.
And then, the architectural survey can become a tool for the unveiling of all their potential, to be activated to frame the decision-making processes in a framework of sustainability of the transformations and of promoting the resilience of the physical and social groups that over the centuries have settled an unique identity heritage as that of the villages.
The formulation of the workflow is therefore divided into the following phases:
phase A) acquisition of information on the architectural and environmental heritage;
phase B) definition of the numerical, graphic and textual material repertoires;
phase C) production of documentary repertoires with multi-scalar basic and critical contents;
phase D) interactive maps for the description of the sensory characteristics of the place: soundmaps, chronomaps, olfactory maps;
phase E) assessment and marking of vulnerability> potential> resilience.
Based on these premises, some experiences of Identity survey were conducted on the two samples of the case study. The convergence between survey data and models of representation is at the same time preparatory to the creation of "identity" maps, which are presented here in the initial phases, and the preliminary phase of the *Urban Atlas of the place*.

Case study

The samples of the case study are two settlements located in north-western Tuscany, in the province of Lucca. Gombitelli and Castelnuovo di Garfagnana are two very different urban realities (table 1), which are therefore not directly comparable, but share the characteristics that define the inland areas already mentioned above:

- a significant distance from the main centers of supply of essential services;
- a large availability of environmental and cultural resources;
- being complex territories, the result of natural systems and processes of anthropization (Castelnuovo di Garfagnana) or depopulation (Gombitelli).

Gombitelli is a small secular village, hit by a heavy depopulation, which has various strengths for a future revitalization, a condition that has not yet constituted a sufficient protection against abandonment, and was the subject of the survey carried out in preparation for the

The case study, main facts.

territorial enhancement of the nascent Ecomuseum of the Seimiglia, in which the Identity survey experience has been applied (Puma 2021).

Squeezed in the hills between the coast and the first foothills of the Apuan Alps, the ancient medieval village of Gombitelli is characterized by the typical landscape deriving from the indestructible intertwining of natural and man-made spontaneous architecture born on the rocky outcrops and shining in the sun for the plasters containing waste from the past iron processing (Anichini, Giannotti 2011).

The village is a fraction of the Municipality of Camaiore, has 130 permanent inhabitants and is centrally located between Lucca (24 km, 37' by car) and Massa Carrara (45 km, 46' by car), and Florence, regional capital (105 km, 1h 35' by car). To use the main services, the village can count on its proximity to Camaiore (14 km, 25' by car), but being 492 meters above sea level, on a ridge of Monte Calvario, on the hills that divide the Valle della Freddana and the Valle della Pedogna, it has always experienced a condition of isolation, marked by the decrease in inhabitants especially in the last 30 years.

The village is a settlement originated around 1000 with the castle of Montemagno, whose visible today ruins are the remains of the first depopulation due to the military destruction of 1242, and the subsequent epidemic.

The other nodal point of the settlement is the church of San Michele, whose medieval bell tower must have been an important landmark for pilgrims, who still pass through here along the Via Francigena Romea.

The arrival in the country of some German blacksmiths in the wake of Charles V allowed its repopulation in the sixteenth century, starting here the manufacture of tacks, which for a long time distinguished Gombitelli and is perhaps also at the origin of its linguistic specificity, for the use of a dialect similar to the northern ones used by the populations who came to work with iron (Repetti 1833).

	Inhabitants *2019*	Health (H) *Km/minutes*	Education (S) *Km/minutes*	Transport *main roads*
Gombitelli	130	22/38'	14,5/25'	4 km da SP1
Castelnuovo Garfagnana	5826	H	S	SP 13, SP 43 FFSS

The second settlement is Castelnuovo di Garfagnana, located in the center of the homonymous valley enclosed by the Apuan Alps, which over the centuries has maintained its isolation in the large forest of chestnut and beech trees (AA. VV. 1993, 2014).
The entire Municipality has about 6,000 inhabitants in its total consistency and is located not far from Lucca (50' by car), Pisa (1h15' by car), Florence (1h50' by car) but has remained closed in on itself, living its own history and building a strong identity that it still retains today.
The town was born in the early Middle Ages and then became an important commercial transit point, but despite being well known for its monumental and naturalistic attractions, it does not develop enough hotel activities, which the Municipality tries to input avoiding mass tourism and activating the construction process of the widespread hotel, a project already started when the urban survey was started.

Results

In Phase A) the two settlements were surveyed through integrated Laser Scanning, Structure From Motion and APR surveys (aerial by drone survey) (Brusaporci 2015).
In the subsequent phases B) and C), the restitution in static 2D drawings and 3D dynamic graphics (ICOMOS (2008, Denard 2009) was carried out, organized as detailed below.
The urban habitat of the two settlements of Gombitelli and Castelnuovo Garfagnana was analyzed in their respective components of structural, visual and perceptual invariance.

structural invariance's components

After the examination of the geographical and historical framework, the survey of the natural anthropized landscape follows with the mapping of the presence of the waterways, which in the case of Castelnuovo di Garfagnana surround the historic center, and of the green belt that surround the two settlements, with analysis of the relationship between these natural elements and the built heritage (the bridges and the relationship with the Serchio river, the building construction around the pre-existing vegetation structures in Gombitelli).

Overview of Gombitelli.

visual invariance's components

From the large-scale geometric 3D model (1:500-1:200), which has the typical essentiality of geometric models, we then zoom to describe the place and the spatial characteristics of the village, expressed through the urban skyline visible from the various directions of arrival in the village, the rhythm of the main paths and spaces (narrow / wide and high / low in the succession and the alternation of streets and squares), the main urban signs and landmarks, the easily recognizable isolated elements emerging from the context and assuming the role of "focuses" of the panoramic vision.

perceptual invariance's components

The landmarks are beside the elements of the townscape, that is those physical forms which, due to their particular conformation and position, define the limits to the gaze and characterize the urban scene.

The townscape has been discretized in the urban language's and urban character's elements, (i.e. the abacus of the shape of the ground attachment of the buildings and the

The urban environment

eaves, the use of architectural orders, the abacus of the openings and the mapping of the most relevant street furnishings).

The analysis has been concluded from the identification of the visual layers, materials and colours of the townscape (roofs, façades, street pavings and chromatic mapping).

Phase D) is in progress and focused on the development of sensory and identity maps. The visualization in a real time timeline of the 2D and 3D graphics as well as the sound map represents the core of the identity map, currently in betaversion.

Particular attention was paid to describing the place in "real time" mode, according to the dynamic ways in which we usually walk and observe a place to represent the spatial and sensorial information received moving on foot, favouring panoramic and relevant itineraries, capturing all the environmental aspects at the same time: from smells to sound to the variation of light throughout the day.

A first test survey of the sound landscape was conducted by identifying the characteristics of the selectioned sounds, and then proceeding with the isolation of those most characterizing the space under study. As there is no codified methodology that provides for the representation of the results of this type of survey, it was set by discretizing the data and graphically representing the datasheet containing the main info: day and time of shooting, day and time of the most characteristic events-sounds, number of the individual sounds, screenshot of the emission of

Overview of Gombitelli.

Overview of Castelnuovo Garfagnana.

each sound, sound level expressed in dB and measured with the Sound meter (in good approximation due the absence of a sound level meter).

The sounds were then also cataloged according to the three categories proposed by Murray Schafer: keynote sounds, sound signals, soundmarks (the keynote sounds are not necessarily perceived in a conscious way and are made up of the sounds created by its natural and artificial geography, therefore in many urban areas the traffic has become a tonic. The sound signals are the sounds in the foreground, consciously listened, to which perform an acoustic warning function, such as alarm devices, bells, whistles, sirens. The soundmarks are the characteristic sounds of an area. Once a soundmark has been identified, it deserves to be protected, because the soundmarks make the acoustic life of a community unique and unmistakable).

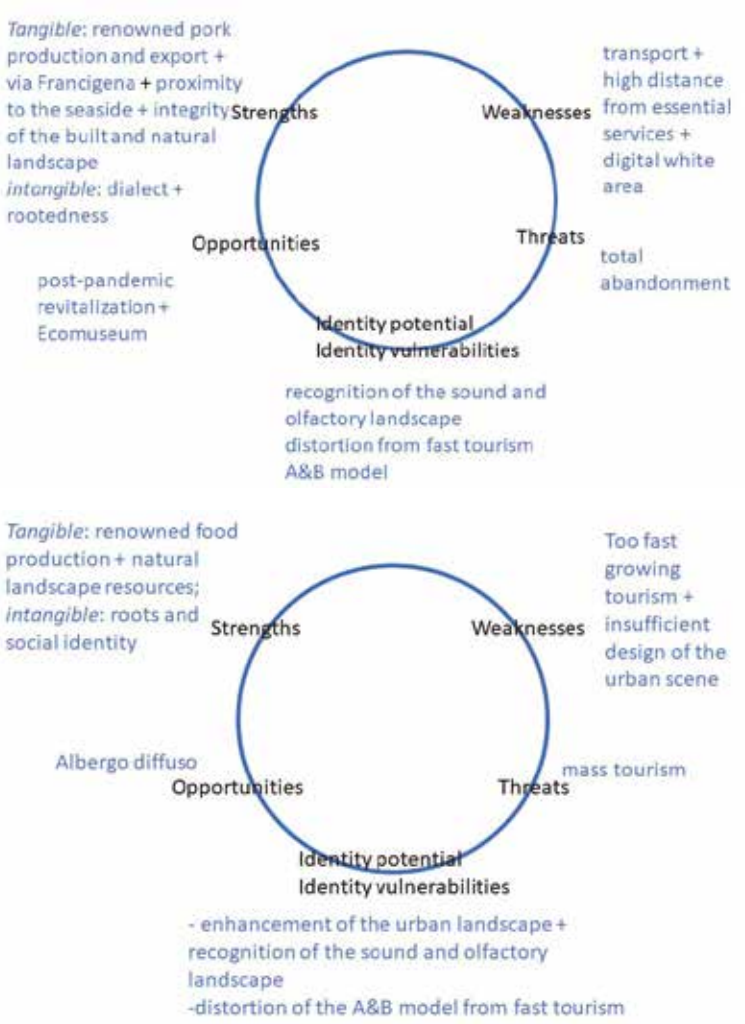
The sounds identified in each of the survey days were treated and extrapolated from the overall shooting and mounted in audio files, corresponding to the survey days, and to be connected to distinct QR codes, to allow quick access even via smartphone (Migliorati 2020).

Conclusions

Assuming this case study as a tentative base for the knowledge plan of the two villages to support their resilience enhancement, the analyzes carried out were organized in a classic SWOT matrix (phase E), which in subsequent research developments will be explored in an interactive way.

First SWOT matrix implemented by the Gombitelli's Identity Survey
the tangible and intangible strengths: renowned charcuteries for export; proximity to the sea; integrity of the natural and built landscape; linguistic island; strong local roots of the community;
the weaknesses: inadequate public transport; deactivated essential services; area uncovered from high speed digital connections;
the opportunities: postpandemic revitalization; activation of the Ecomuseum of the Seimiglia;
the threats: increase of the digital divide in the event of non-investment in the fast digital network;
identity potentialities: recognition and marking of the sound and olfactory landscape;
identity vulnerabilities: distortion from fast tourism (airification).

First SWOT matrix implemented by the Identity Survey of Castelnuovo Garfagnana
the tangible and intangible strengths: renowned gastronomic production; natural landscape resources; strong local roots of the community and strong sense of collective identity;
the weaknesses: unmet tourist demand; little attention to the care of the urban scene;
the opportunities: activation of the widespread hotel;
the threats: ungoverned tourist supply;



First SWOT matrix implemented by the Identity Survey, left: Gombitelli, right: Castelnuovo Garfagnana.

identity potentialities: enhancement of the townscape's design; recognition and marking of the sound and olfactory landscape;
identity vulnerabilities: distortion from fast tourism (airification).
Many of the weaknesses that emerged from the above framework of analysis constitute some of the topics currently in the foreground discussion on the reconfiguration of post-pandemic territorial arrangements; they could paradoxically take advantage of this historical moment in which sustainability is innovatively declined in material, social and economic activities that closely concern the realities of the villages, with potential positive effects of physical and digital infrastructure, involvement of communities in decision-making processes, activation of circular-green economy practices attentive to the voices of the territories.

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The urban survey of Castelnuovo Garfagnana has been carried out in the framework of the general project coordinated by Antonella Trombadore- DiDA/University of Florence.

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GARFAGNANA, A PROJECT FOR THE REBIRTH

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Università degli Studi di Firenze-Italia

The inland areas of our region are often isolated or poorly linked to the main development poles, resulting in major problems of depopulation, an ageing of the residual population and a decline in economic activities. However, these "marginal" places have some potential for development. It then becomes necessary to provide a strategy of analysis and knowledge of these areas, to define guidelines and guidelines capable of guaranteeing conservation and enhancement solutions of these territories.

In recent years the Italian territory, and in particular the internal areas, whose economy was once based on the agro-forestry-pastoral system, has increasingly depopulated, in favor of urban areas. This trend is shared with many other European and Mediterranean counties and the European authorities, through the most careful control of regional organizations, tries to fight it, with funds aimed at the economic revival of these areas, in particular through tourism.

Tuscany, in accordance with national guidelines, has identified four areas to allocate 3.74 million euros to encourage their rebirth and avoid depopulation. Among these, there is Garfagnana, a territory endowed with great natural riches, such as the Apuan Alps, and the presence of waters and rivers, and anthropic-cultural assets, such as the numerous villages with a thousand-year history, marked by Lombard domination. However, Garfagnana is also among those areas most at risk of depopulation due to the progressive aging of the population and abandonment in favor of the valley. After the Second World War, in fact, with the radical change of the economic system, all those rural settlements, that previously survived self-sufficient on the slopes of the Apuan Alps, were gradually abandoned, both for the distance from the essential services and for the difficulty of moving. These characteristics meant that in the ranking of the 300 Tuscan municipalities with the greatest development difficulties, 21 Municipalities included in this area appear in the first 30 places. These abandonments led not only to the depopulation of an entire region and the consequent loss of services, but also to the impoverishment of the landscape heritage, due to the progressive invasion of the forest on agricultural areas, pastures and chestnut trees. How can we stop this decline? How can we avoid the loss of an immense territorial, landscape, cultural heritage?

The Architecture Department of the University of Florence, in collaboration with the Tuscan Regional Committee of the Federciclismo and the Union of Municipalities of the Garfagnana, have worked on a project for the tourist redevelopment of the municipalities of Careggine and Fabbriche di Vergemoli, on whose territories numerous attractive emergencies persist: the Vagli Lake, formed artificially with the construction of a hydroelectric dam by the Edron Stream by SELT Valdarno (today ENEL spa), which submerged some villages, today visible only during sporadic maintenance work (the last in 1994, the next in 2021). There is the Grotta del Vento, in the municipality of Fabbriche di Vergemoli, which today has three internal tourist routes, but not a collective accommodation and information structure. Also the forest paths between the municipalities of Careggine and Fabbriche di Vergemoli, would constitute, if enhanced, a magnificent opportunity for sports tourism in the Garfagnana. The University of Florence has the purpose with its CONOSCICINBICI. Disvelare e Mostrare, of enhancing these attractions, identifying definite itineraries and installing panels and structures that host dedicated exhibitions, thus expanding the knowledge and survey of such a rich area.

With these means the hope is to be able to reverse the trend, to revive the Garfagnana and to reinvent it, transporting it from its agricultural past to its future based on knowledge and respect for its millenary culture.

Keywords: Mountain areas, Territorial requalification, Landscape survey

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

The bike is a tool of discovery. It is the most suitable and versatile means to immerse yourself in the Wonders of Italy because it allows you to adapt each to your own rhythm, to stop and start again according to the emotion of the moment and, above all, always leaves the freedom to deviate from the predetermined way to go in search of a glimpse, a small church or a village whose existence was not even suspected until recently.

Introduction

Garfagnana, a land with a glorious past, rich in history and natural and architectural beauties, is today a place characterized by evident signs of structural weakness, caused by the distance from essential services, the depopulation and senilization of the population, the loss of functions and identity of the place. However, it has a landscape full of historical and cultural peculiarities able to guarantee the possibility of reconversion and revaluation. Garfagnana's renewal has to support itself with the great tourist potential of the area: since the Middle Ages the Garfagnana was crossed by important communication arteries. These paths have been almost completely abandoned, but they could give new life to sports tourism, in particular to cycle tourism and thus guarantee a structural rebirth. This is the goal that the University of Florence has set, with the research carried out so far and with the *Conoscinbici* project, which will be illustrated in the next paragraphs.

State of the art

As mentioned before, the Garfagnana is a territory rich in history: the area, which for many centuries was a borderland between the republic of Lucca, the Duchy and the Estensi state, is characterized by important historical pre-existences and road traces that connected Lucca with northern Italy and Europe. In medieval times, the Garfagnana, in fact, represented almost an obligatory passage, for those from Northern Europe, especially from Great Britain and France, who went on pilgrimage to Rome and vice versa. The pilgrims,

in fact, after crossing the Apennines, had two alternatives to reach Lucca and then Rome: either, having reached Luni, travel the coast, or go up the Lunigiana and the Garfagnana. The first solution could be dangerous for malaria, pirate raids and the presence of the Byzantines. Here, then, is the origin of the Garfagnana road system and the birth along it of numerous 'hospitales' to welcome travelers. The most important itineraries that pass through the Garfagnana are the Chemin d'Assise, the Via del Volto Santo and obviously the Francigena.

While the Francigena avoids the areas of Garfagnana and Lunigiana located higher up, only crossing some towns in the Lucchesia (such as Altopascio), the Via del Volto Santo goes much further into the mountain area. This route was initially born as a simple deviation of the Francigena itself (Verrini, 2017), as an alternative route that allowed to reach an important pilgrimage destination, the Holy Face. This is a wooden statue collocated in the cathedral of San Martino in Lucca, built, according to the legend, from Nicodemus helped by some angels, in memory of the moment in which he laid Christ in the tomb (Romano. 2003). The first pilgrims arrived around the eighth century, but it was then in the twelfth century that the tradition spread massively. Although the route has been used for centuries, it was only in 2008 that it was decided to strengthen it, systematizing the information, providing it with new signs and indications and a site that would help the curious to find their way around. From this moment on, the path was increasingly publicized, increasing the number of interested parties more and more.

The Chemin d'Assise, although it is a "younger" path, has been rediscovered earlier than the Via del Volto Santo. Born to retrace the places that characterized the life of St. Francis, it provides the possibility to choose between a fairly long pilgrimage (if you decide to start from Vezelay) or to limit yourself to central Italy, where the 300 km of the journey are divided into 13 stages. Thanks also to the twinning with the Camino de Santiago de Compostela, the Chemin d'Assise is already very popular and has been equipped, like the Francigena, with specific signs and symbols: the Tau (typical of Franciscan friars) accompanied by a dove indicating the way to go. Where it is impossible to put up a sign, the direction of the path is indicated with colors, black and orange.

In conclusion, these routes have evolved into a form of slow tourism along the main communication arteries of the Middle Ages and of the early stages of the modern age, helping to create the landscape and cultural features of the area.

The Garfagnana, despite these important paths, is now in a state of profound crisis. In fact, after the Second World War, a radical change in the economic system has occurred. All those rural settlements that had survived almost self-sufficiently on the slopes of the Apuan Alps, were gradually abandoned, both for the distance from the essential services and for the

The via del Volto Santo or Francigena di montagna was the mountain route that joined the Lunigiana to the Garfagnana and that led to Lucca, a very important destination of the medieval pilgrimage for devotion to the Holy Face, the wooden crucifix displayed in the Cathedral of Lucca and depicting the true face of Jesus. It was an alternative route to the Sigeric route (12th century), the Via Francigena, the road that allowed the "Romei" to reach Rome, passing through Lucca and the crucifix of the Holy Face. This alternative route skipped the coast and the dangers of malar disease and pirate attacks. It descended from the Lunigiana through the Tea Pass.

difficulty of the movements, given by the progressive congestion of the only two fundamental arteries that follow the path of the Serchio. These characteristics have meant that in the ranking of the 300 Tuscan municipalities with the greatest development difficulties, 21 Municipalities included in this area appear in the first 30 places (Regione Toscana, 2018). These abandonments have led not only to the depopulation of an entire region and the consequent loss of services, but also to the impoverishment of the landscape heritage, due to the progressive invasion of the forest damaging agricultural areas, pastures and fruit chestnut groves.

A redevelopment is therefore necessary, wich can be based on a project that is able to enhance the historical-architectural emergencies and the naturalistic beauties of the territory of Garfagnana, Lunigiana and Mediavalle del Serchio. This is the purpose of the research project promoted, starting from 2018, by the Survey Laboratory of the Department of Architecture of the University of Florence in synergy with the Union of Municipalities of Garfagnana and the Tuscan Regional Committee of the Italian Cycling Federation. The project was in line with the provisions of the National Strategy for the internal areas of the country, implemented by the Italian Government, which represents a direct action to support sustainable territorial competitiveness, in order to counter, in the mid-term, the demographic decline that characterizes some areas of the country. These areas are those ones furthest from the primary and advanced essential service

poles, which correspond to 60% of the territorial surface, 52% of the municipalities and 22% of the Italian population, including the Garfagnana.

The project is based on the belief that it is possible to exploit the important pre-existing road axes to favor a form of tourism, now encouraged by national and local government policies: cycle tourism. The relationship between sport and culture is evident through this practice since the possibilities opened up by the emotional involvement dictated by sporting practice are evident. Playing sports in quality contexts stimulates an ever-greater interest in historical and architectural factors and therefore encourages an ever-greater involvement in paths otherwise rarely traveled.

However, although this is a common practice abroad, it is not as practiced in Italy, where an adequate national support structure is still lacking, especially for foreign tourists. Those who decide to discover our territory through the use of bicycles, in fact, come across the lack of adequate services, the scarcity of signs and safe sections reserved only for cyclists; there are too many roads with mixed circulation and therefore dangerous, too many accommodation facilities not equipped to accommodate tourists with their bycicle. The project promoted in Garfagnana could therefore be part of a broader plan of incentives for this positive phenomenon.

First of all, to define an effective program to create a cycle tourism system that has the ability to improve the cognitive, cultural and economic processes of a territory, it is necessary to have a careful knowledge of the places and their emerging properties on which to set up an enhancement path. This first phase, of knowledge, study and surveys, took place in 2018 and involved the aforementioned entities. This operation made it possible to collect a lot of data, which later proved useful for the preparation of the CONOSCINBICI project.

Knowledge, ways and methods

The research was initially based on an analysis of the territorial system and then went into detail through the survey of a system of ancient medieval infrastructures, characteristic elements, which have become fundamental emergencies in the Garfagnana landscape. The research carried out by the Survey Department culminated in the publication of a Book, in which all the results of the surveys carried out are reported; alongside a brief overview of the historical and archival information that can be found on the various fortresses and bridges of Garfagnana, there are photographs and the location of the study area. Then, they made reliefs with the aid of a laser scanner, reconstructions, by photogrammetry, of three-dimensional models and consequent digitization point cloud. Thus, the legibility of architecture that was once an integral part of the local road system was ensured, with a view to bringing them back to their ancient splendor. In particular, the reliefs of the medieval bridges, built between

Some of the bridges analyzed and documented during the important campaign of the research project conducted for the Union of Municipalities of Garfagnana.

Assonometric view.

1300 and 1600, which can thus be included in the paths marked out for tourists, were fundamental in the perspective of the cycle tourism project.

Once it had a detailed knowledge of the territory, the Department of Architecture of the University of Florence, in collaboration with the Tuscan Regional Committee of the Federciclismo and the Union of Municipalities of Garfagnana, developed the project, focusing in particular on the municipalities of Careggine and Fabbriche of Vergemoli, on whose territories there are numerous attractive emergencies: Lake Vagli, artificially formed following the construction of a hydroelectric dam on the Edron stream by SELT Valdarno (today ENEL spa), which submerged some villages, today visible only during sporadic maintenance interventions (the last in 1994, the next in 2021); the Grotta del Vento, in the municipality of Fabbriche di Vergemoli, currently equipped with three internal tourist routes, but not with an accommodation and collective information structure; the wooded paths between the towns of Careggine and Fabbriche di Vergemoli, which, if exploited, would constitute a magnificent opportunity for sports tourism in the Garfagnana.

The project includes a further cognitive study, with the archaeological excavation of the medieval fortress in Castellaccio in the municipality of Fabbriche and the metric survey of the submerged village by Lake Vagli; it has to be carried out after the opening of the dam, through aerial photogrammetric and aerial surveys and three-dimensional survey with Laser Scanner instrumentation. Once this information has been obtained, they will

be made readable through the creation of two-dimensional and three-dimensional graphics. These materials will be necessary to create explanatory panels of the most important architectures in the area and will be available in a continuously updated digital database. (Pancani, 2017). Three different cycling itineraries were then thought of, diversified in terms of time and difficulty according to the categories of users: the first itinerary (max 60 min) in the municipality of Careggine, from the town to lake, is designed for families and occasional cyclists; the second itinerary (max 150 min) from the town of Fabbriche di Vallico passing through Campolemisi, San Pellegrinetto to the wind cave, designed for cyclists and two-wheel enthusiasts; the third itinerary (over 240 min) of communication between the wind cave and the Vagli lake, passing through the factories of Vergemoli, designed for bicycle and nature lovers and for those who train.

The project then provides for the installation of a permanent exhibition spread throughout the territory: in particular the exhibition will have its pivotal locations in Careggine, at the municipal structure, in Fabbriche di Vergemoli in the open space in front of the Wind Cave (in a special mobile structure) and along the three cycle routes mentioned above. For these, explanatory panels and structures, possibly mobile, will be provided to be distributed along the prevailing paths. Furthermore, a three-dimensional reproduction of the village submerged by Lake Vagli will be designed.

All these interventions will then be promoted in the municipalities, schools, commercial activities in the sports and tourism sector, with the creation of flyers / brochures and advertising

Medieval bridge in San Michele. Province of Lucca.
A qualitative survey carried out with traditional relevant techniques and the introduction of technologies such as laser scanning and photogrammetry for the creation of point clouds to create three-dimensional models.

Planimetric view of the bridge

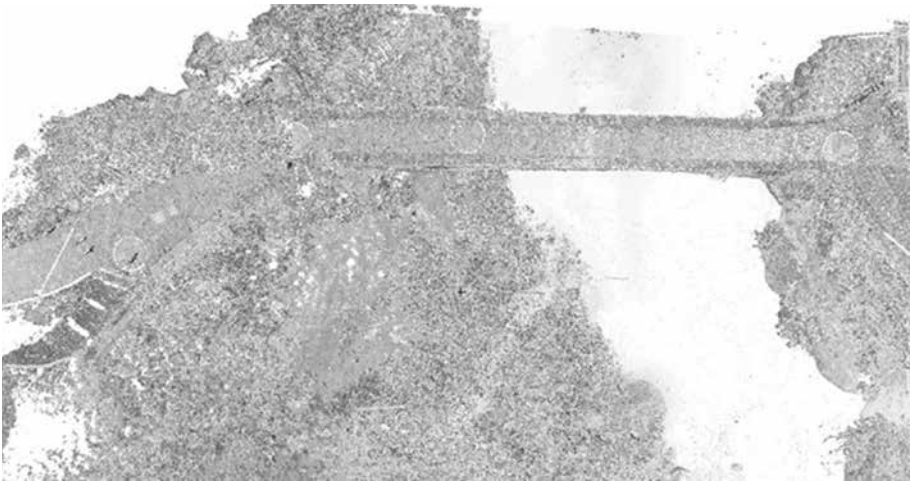
Perspective view of the Bridge of St. Michael.

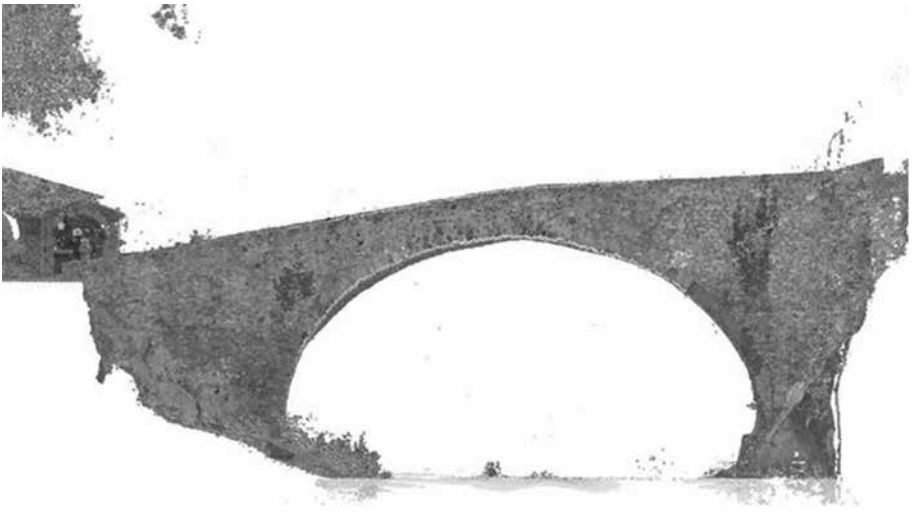
through the sites of the departments and municipalities involved and their official pages on the various social networks.

The project is in line with the Rural Development Program (RDP) of the Tuscany Region and the Integrated Local Development Strategy and aims to be included in the Call for implementation of operation 7.6.2 "Redevelopment and enhancement of cultural heritage". In this way, it hope to find funding, although necessary for the surveys and the graphic rendering are made available by the departments of the universities of Florence and Pavia. The involvement of such important institutions and possibly even private individuals could make the project even more participatory and involve the population in a profound way, ensuring that the benefits are not only for tourists, but also for the citizens themselves.

Expected results and conclusions

The main purpose of the project, as mentioned, is to facilitate the process of tourist attraction in the area for the enhancement of natural, cultural and sustainable tourism resources. The idea is to recover an original dimension of the "sporting" experience, that is a total and almost primitive immersion in naturalistic itineraries and to facilitate, through the perceptive immediacy of physical activity, the construction of new bonds with the





territory. Since Conoscinbici also provides for the active participation, through internships and collaborations, of the new generations, we hope for a strengthening of the sense of identity of the place and of belonging.

In conclusion, the hope is to give new attractive possibilities to Garfagnana so as to be able to transport it from its agricultural past to its future based on knowledge and respect for its millenary culture.

Vagli: the lake and the submerged village. In this area between the Apuan Alps and the Tuscan-Emilian Apennines, in 1946/47 Enel built an artificial reservoir with the intention of bringing water to the Castelnuovo di Garfagnana power plant and becoming a water reserve for the whole area. In the valley destined to house the basin was the village of Fabbriche di Careggine, a village of blacksmiths built in the thirteenth century that was evacuated and completely submerged by water.

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COMMUNITY ENGAGEMENT FOR THE ENHANCEMENT OF RURAL HERITAGE SYSTEMS: PANTELLERIA AS CASE STUDY

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Politecnico di Milano-Italia

The complex agricultural pattern of the Mandrolisai area (Atzara), in Sardinia. Picture elaborated from Google Earth, Maxar Technologies, 2020.

Rural landscapes as heritage have been defined as the continuous intertwine among tangible and intangible elements and as the manifestation of communities' actions in time. Pantelleria island perfectly fits these definitions. Indeed, its rural landscape is the result of an ongoing relationship between the society and its environment, who has shaped in time a distinctive agricultural system, which has been recognized as heritage both on the national and international level.
The design of sustainable development strategies focused on rural heritage can be crucial for the future of the historical rural landscape, as Pantelleria one. Several studies have underlined the importance of involving stakeholders in drafting plans and conservation actions for rural landscapes. In the light of this awareness of benefits from stakeholders' involvement, the paper proposes an integrated and people-based methodology, geared towards the definition of drivers for local development and heritage-based strategies for Pantelleria rural landscape. The proposed methodology suggests the integration between a Hard System Analysis and a Soft System Analysis. The main advantages of this methodology lie in the fact that it proposes quick and straightforward tools, allowing to include different stakeholders' perspectives in the decisional process, and that it can be easily integrated with some participatory tools for strategy design.

Keywords: rural landscapes, heritage, community, institutional analysis, soft system analysis

Introduction

The island of Pantelleria is set in the Mediterranean Sea, at the south-west of Sicily. Due to its position, the island is subjected to strong winds and severe climate conditions, such as long periods of droughts. The morphology of Pantelleria is the product of volcanic activities, thus resulting in a territory characterized by steep slopes. Although the environment of the island is challenging, its population has tenaciously shaped in the centuries a resilient rural landscape, able to cope with difficult existing conditions in terms of climate, soil and morphology.

The rural landscape of the island has been modelled in time, creating a system composed by diverse elements: steep slopes have been moulded in terraces, using dry-stone walls as linear elements to retain the terrain necessary to receive cultivations; the scarcity of water sources resulted in the creation of ingenious agricultural techniques, such as the head-trained bush

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Fig. 1
Terraces, dry stone walls and dammusi in Pantelleria. Picture by M. Rossitti.

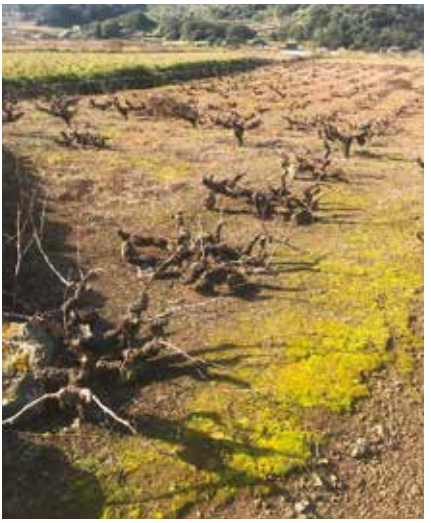


Fig. 2
A field cultivated using the traditional technique of the head-trained bush vines in Pantelleria. Picture by M. Rossitti.

vines (*vite ad alberello*); to prevent the possible wind damages to trees, circular dry-stone fences (*giardino pantesco*) have been built around plants, contributing also to generate an ideal micro-climate for cultivation. In addition, specific built elements, the so-called *dammusi*, are scattered over the whole island: erected in stone and presenting a vaulted roof, these buildings can host a variety of uses, ranging from the ones related to agricultural activities to the residential ones (Fig. 1-2).

Fig. 4
An aerial view in El Borge (Malaga province, Andalusìa): besides the farmhouses it is possible to notice the peculiar drying floors used to process raisins. Picture elaborated from Google Earth, Maxar Technologies, 2020.

As stated, the island of Pantelleria faces numerous critical aspects, common to many agricultural heritage systems. In general, besides the environmental issues, rural heritage systems are characterized by abandonment of agricultural activities and traditional practices, ageing of population and low levels of accessibility: still, besides being set in remote areas, these sites are not isolated and maintain relationships with their proximities.

In the case of Pantelleria, the island has been affected in time by the aforementioned vulnerability factors impacting on the agricultural heritage: while accessibility is one of the main criticalities, the inhabitants of the island still have a decisive role in the conservation of the system. Even facing issues such as the decreasing of population, especially in the second half of XX century, it can be assumed that rural heritage in Pantelleria encloses a strong identity-making role for the residents, which has rooted families to the island. The community still transmits in time, generation by generation, traditional practices and knowledges related to cultivation, shaping in centuries the whole appearance of the system.

For these reasons, the Traditional practice of cultivating the *'vite ad alberello'* of Pantelleria was recognized as Intangible Cultural Heritage in 2014 (UNESCO, 2014) and the dry-stone landscape of the island has been listed in the *National Register of Historical Rural Landscapes* in 2018 (Rete Rurale Nazionale, no date).

Yet, even being a unique and exceptional case on its own, rural heritage systems like the one of Pantelleria exists both on the Italian and international scenario.

In Italy, the *traditional vineyards of Mandrolisai* are set at the core of Sardinia, one of the major islands of the Country. This peculiar site is characterized also by the cultivation of head-trained bush vines, using a technique similar to the one documented in Pantelleria (FIG. 3). Even though such system has been recognized as one of the representative rural heritages of the Country, given the listing of the site in the *National Register of Historical Rural Landscapes* (Rete Rurale Nazionale, no date), the whole area of Mandrolisai faces criticalities of a progressive population degrowth and of a consequential leaving of rural areas. Like in the case of Pantelleria, such vulnerability factors are generated not only by the difficulties related to the cultivation techniques required by the head-trained bush vines: issues affecting the heritage system are traced in the social and economic domains also, related to low levels of

Fig. 5
Rice terraces of the Philippines Cordilleras, in Banaue. Picture elaborated from Google Earth, Maxar Technologies, 2020.

accessibility to primary services to citizens (health, education, mobility) that might have contributed to the phenomena of migration from rural to predominantly urban areas (Dettori et al, 2018).

On the international context, other rural heritage systems encounter factors that might be critical for their preservation in time: examples can be traced in Europe and south-east Asia.

In Spain, the production of raisins in the district of La Axarquía (Malaga province, Andalusìa) has been recognized by FAO as *Globally Important Agricultural Heritage System* (GIAHS) in 2017, listed as "*Malaga Raisin Production System in La Axarquía, Spain*" (FAO, no date). Similar to the above-mentioned Italian case studies, the landscape is shaped by communities who, practicing specific cultivation activities, have designed in time the whole territory of the district, including traditional practices and defining the layout of rural buildings so as to accommodate the production at its best.

La Axarquía system, in fact, is characterized not only by the vineyards: cultivations are complemented by specific drying floors, realized to host the sun-drying of grapes, a crucial part of the production of the raisins (Fig. 4).

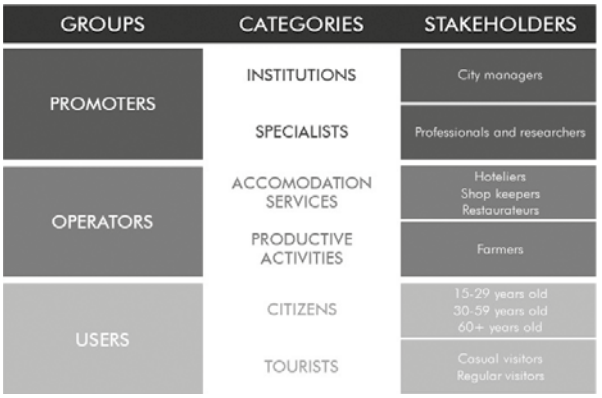
As the dry-stone elements present in Pantelleria and in the Mandrolisai systems, the drying floors and cultivations of *La Axarquía* are a particular character of the district, realized to gain the most from the climate and morphology of the area. Yet, the system is menaced by the ageing of the population actively involved in the agricultural activities and by a reduction of cultivation of grapes in the area, caused also by the scarce profitability of the raisins in relation to the efforts required by the production (*Proposal for designation as Globally Important Agricultural Heritage System (GIAHS). Málaga Raisins. Spain*, 2017).

The Rice terraces of the Philippines *Cordilleras* are recognized by the World Heritage Centre (UNESCO) as *cultural landscape* and by FAO as GIAHS (UNESCO, 1996; FAO, no date). Even if the terraces are predominantly cultivated as rice crops, the system encompasses a strong biodiversity and has provided in time a wide range of ecosystem services, which have resulted in the long-lasting self-sufficiency of the community until recent times (Fig. 5). The cultivation practices of the terraces are linked with traditional knowledge and immaterial heritage, such as oral transmission of techniques: as in the site of Pantelleria, the *Hudhud chants of Ifugao*, the inheritance related to rice crops agriculture of the Cordilleras, has been listed as intangible cultural heritage of humanity in 2008 (UNESCO, 2008). Still, the site has been endangered in time by endogenous and exogenous factors: firstly, the introduction of non-native species and the installation of mechanical irrigation; secondly, the system has been shocked by a high touristic pressure and by the consequent shift of resources from agriculture to tourism sectors (UNESCO, 1999).

As highlighted by the study cases previously described, the progressive loss of these system is related to the weakening of the communities, who are transmitting a rich repository of knowledge in time. In fact, the intercourses among material and immaterial components of these sites have a reflection on rural landscapes on different levels: on the one hand, the diffusion of traditional knowledge and related practices encourages the conservation of rural heritage; on the other, these relationship and inheritance enforce the sense of inclusion and might serve as a driven for local development, raising also awareness on the role of a community in connection with its context.

However, as a counteraction against critical aspects, the pre-mentioned case studies provide also evidence of the role of communities as a focal point in interventions addressed to the sustainable and dynamic conservation of rural heritage systems.

In the specific, local development and well-being of the inhabitants in the municipalities part of the traditional vineyards of Mandrolisai, in the context of the *National Strategy for the Inner Areas* is set at the centre of territorial policies. Based on a participatory discussion and co-design of interventions, the strategy for the Area recognizes the potential of traditional



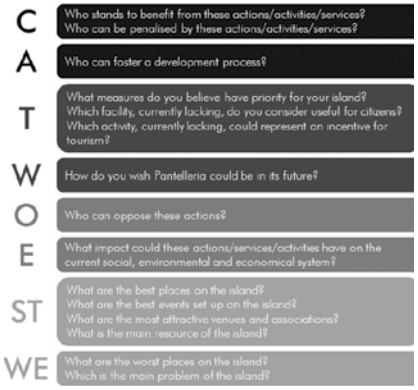


Fig. 6 Stakeholders' map (Authors' elaboration).

Fig. 7 Stakeholders' map (Authors' elaboration).

agricultural system in the region as one of the assets to foster an enduring permanence of the community, contrasting population degrowth and abandonment of rural activities (Strategia Area Gennargentu Mandrolisai. Una vita di qualità nel cuore della Sardegna, 2019). In La Axarquía, the candidacy of the area as GIAHS has enforced the participation of stakeholders in the process of management and safeguard of the system (Proposal for designation as Globally Important Agricultural Heritage System (GIAHS). Málaga Raisins. Spain, 2017). In the case of the Rice terraces of the Philippines *Cordilleras*, the involvement and engagement of the local community in conservation projects and investigations related to the widespread heritage of the region has acted as a support for the preservation of the rural heritage system as a whole (Dulnuan, 2019).

Inclusion of communities in drafting of management and conservation policies, considering their potential role as stewards of rural heritage is therefore of great importance. As suggested by the cases briefly analysed, the design of sustainable development strategies should be focused on participation, to better address actions and interventions aimed to preservation of historical rural landscape sites.

The methodology

In the light of the complexity of the rural heritage in an island context, the paper proposes a methodology, aimed at dealing with this complexity and at enhancing the rural heritage systems potentialities. This methodology is borrowed from a multi-methodological approach, aimed at defining sustainable enhancement strategies addressed to a

landscape in the context of Campania Region (Italy) (Cerreta, Malangone, 2014), and is shaped according to the specificities and needs of the context under study. In this sense, it relies on the stakeholders' involvement as a crucial factor for the definition of drivers for local development and heritage-based strategies for the Pantelleria rural landscape. Indeed, several recent studies have underlined the importance of participatory approaches to involve stakeholders in drafting management plans and conservation actions for rural landscape (Ferretti, Gandino, 2018; Gullino, Devecchi, Larcher, 2020; Lee, 2020). In the specific, the stakeholders' involvement is allowed by the integration between the Hard System Analysis and the Soft System Analysis. The Hard System Analysis deals with the collection of objective and countable data on Pantelleria rural landscape, devoted to a deep understanding of the context under investigation (Cerreta, Sandulli, 2013): this analysis focus both on the physical aspects of the island and its social and economic features, its cultural values and land use regulation. The Soft System Analysis, instead, can be defined as an approach to complexity stemming from the existence of different interacting elements and conflicting points of view (Wilson, Morren, 1990). The collection of 'soft' data requires the preliminary design of a map of the stakeholders engaged in the decisional process through the Institutional Analysis technique (Funtowicz et al, 2002). The following paragraphs describe the implementation of the Institutional Analysis and Soft Systems Analysis techniques to Pantelleria rural system.

Institutional analysis

The institutional analysis is crucial to identify the human sources involved in the decisional process, as well as to gain a clear understanding of the community's perception. Moving from the analysis of the hard data, related to the social and economic dynamics of Pantelleria island, it has been possible to design a comprehensive map of all the different stakeholders to be engaged in the decisional process. In the specific, the map divides the relevant stakeholders into three groups (Fig. 6):

- The first group includes institutions and experts: they can influence choices for the community thanks to their knowledge and expertise, their prominent positions and credibility.
- The second group comprises operators in the leading sectors for Pantelleria economic system, the productive and touristic activities, and their respective trade associations.
- The third group includes citizens and tourists, who have a high interest in the enhancement and regeneration of Pantelleria rural system, but a low influence.

Soft system analysis

Once defined the stakeholders' map, with a view to the collection of the soft data for the definition of drivers for local development and heritage-based strategies for Pantelleria rural landscape, the points of view of the different stakeholders have been analysed through two different tools:

- An on-line questionnaire with multiple-choice questions aimed at understanding the community's point of view on several aspects of Pantelleria rural heritage system, raised for the Hard System Analysis and from an in-depth study of Pantelleria Application Dossier for the National Register of Historical Rural Landscapes (Registro Nazionale dei Paesaggi Rurali Storici, Dossier di candidatura "Il paesaggio della pietra a secco dell'Isola di Pantelleria", 2018).The questionnaire has been brought to Pantelleria citizens attention through the social network *Facebook* and has been organized in three sections: a first one, aimed at defining the sample structure; a second one, focusing on the rural system's strengths and weaknesses in its community perception; a third one, oriented to pulling out some possible drivers for the definition of shared development strategies.
- Interviews with preferential actors, representative of each group of stakeholders, identified thanks to the Institutional Analysis. These interviews have been conducted during a field trip and have been based on the CATWOE Approach (Fig. 7) (Mulder, 2017). The CATWOE is a technique developed as part of the Soft systems methodology (Checkland, 2001), which allow to focus on the different aspects of the issue to be faced and to define project solutions meeting the various stakeholders' desires and expectations. It is a simple checklist, which gives an ethical dimension to the problem-solving approach. An interview structure, organized according to the CATWOE approach, is organized in the following sections:
- Customers: this point gears towards the identification of the target of the transformation strategies, to understand how the transformation can affect this target;
- Actors: this section is oriented to the definition of the possible actors of the development process to be designed and, thus, implemented; their level of skill and interest can give an idea of the impact of the development process on Pantelleria rural system;
- Transformation Process: this stage aims at understanding the different points of view related to the possible transformation trajectories in terms of inputs and outputs;
- World View: this point introduces a creative component in the analysis since it is geared to open the debate to unconventional perspectives, without considering the existing constraints or the interests at stake;

- Owners: this stage focuses on the identification of people whose authority can influence the success of the development strategies;
- Environmental Constraints: this section aims at considering all the constraints imposed on the transformation process by the regulative systems and by the ecological, social, and economic system of intervention.

The model used for Pantelleria rural system has enriched the checklist from the CATWOE approach with two further points, to gain a better understanding of the context under examination and to draw out some reliable references for sustainable heritage-based strategies:

- Weaknesses: this point is oriented to understand the main weaknesses of Pantelleria rural system in its community perception;
- Strengths: this section aims at pinpointing the main strengths of the territorial scope, which can represent successful drivers for local development strategies.

Below the list of questions for the interviews to preferential actors, divided into the sections provided by the CATWOE approach, is displayed. It is important to underline that some of the questions for the interviews match with the one in the on-line questionnaire: this choice stems from the willingness to improve, when possible, the partial vision related to an interview to preferential actors.

Results

The analysis of 'soft' data, derived for the on-line questionnaire and the interviews with preferential actors, have shown a substantial agreement among the different categories of stakeholders on the issues brought to their attention. The 'dammuso' is recognized as the main symbol of the rural landscape, thus showing the extraordinary importance of this unique example of vernacular and bioclimatic architecture. Also, the 'wind' stands as a crucial element for Pantelleria rural system, since it is perceived not only as an environmental factor, but as an influencing element for the social, economic, and spatial structure of the island. On the contrary, terraces are surprisingly not considered as a symbol element of the island's rural system, even if they are one of the products of the relationship between nature and men, which make Pantelleria an extraordinary rural landscape example: this circumstance can be seen as a signal of the progressive loss of the traditional practices and knowledges, representing one of the main menaces for such a peculiar territorial context.

The different categories of stakeholders meet in considering the areas with a natural dominance as the best places on the island, while the mobility and the lack of services are the main issues to be faced. Another interesting aspect is related to the community's perception of tourism: the sector is seen as one of the significant resources of the island, to be encouraged

through the differentiation of its offer. Finally, the Soft System Analysis has brought out that culture does not represent a potentiality for development, both in the citizens' and in the tourists' perception.

Thanks to this information stemmed from the interaction with the different categories of stakeholders, it has been possible to draw out some drivers for local development and heritage-based strategies for Pantelleria rural landscape. The underlying idea is that it is not possible to conceive rural heritage-based actions, without combining them with intervention aimed at tackling the island's structural issues in a local development perspective. In this light, it seems appropriate to draw out rural heritage-based and development strategies aimed both at filling the gap of services to citizens and at diversifying the touristic offer. This goal can be pursued through the recovery of the neglected terraces, the re-use of the abandoned 'dammusi' and the promotion of compatible functions and activities, linked to the island's tradition and vocation, thus boosting the preservation and enhancement of the historical rural landscape. Beyond the 'tangible heritage', innovative and sustainable strategies for rural heritage regeneration and development can rely on 'intangible heritage': it includes not only the traditional practice of cultivating the '*vite ad alberello*,' well-known worldwide thanks to the UNESCO recognition, but many other elements, which are not adequately valued. Among these, it is worth mentioning the hybridization between western and Arabic culture: this is something that strongly emerges in the island's toponymies, in the local architecture and the culinary culture. For these reasons, together with the preservation and enhancement of traditional agricultural practices, a possible revival of this form of cultural hybridization can inspire alternative development trajectories, but still starting from the system of values that Pantelleria rural landscape owns.

Discussion

The results of the analysis have highlighted the potential drivers for local development as expressed by the stakeholders on the territory. The answers given by the stakeholders have also underlined, on the one hand, how Pantelleria historical rural landscape encompasses the ability of the population to cope with "critical" conditions specific to the morphology and climate of the island, while on the other how the island represents an extraordinary repository of diversified components that have changed in time, following different circumstances.

Indeed, the rural heritage of Pantelleria is an exceptional example of adaptation to specific conditions, which in more recent times must face the growing issues that are impacting

both the national and global scenario. Among those, the economic, social and climate dynamics are the one that place the most urgent challenges to the conservation of Pantelleria system. Preservation of rural heritage must be assumed as a possible driven to safeguard loss of biodiversity, reduce hydro-geological hazards and create opportunities for the risen of a diversified local economy.

According to this framework, sustainability of policies and interventions in this direction should ensure safety and welfare to the inhabitants and the community experiencing this complex heritage system, being able, at the same time, to possibly react to large-scale events that might compromise the site as a whole.

For these reasons, sustainable and shared strategies, aiming at preserving and enhancing this extraordinary reservoir of tangible and intangible values, are needed. In the light of the acknowledged importance of local community involvement in planning issues, the paper proposes an integrated and people-based methodology, geared towards the definition of drivers for local development and heritage-based strategies for Pantelleria rural landscape. This approach can catalyze the resources Pantelleria community is endowed it, thus running it back to a living and active rural community. Indeed, many recent active rurality experiences, both spontaneous[1] or institutionalized[2], show their positive effects in enhancing rural systems and tackling the ongoing abandonment trends.

The main advantage of this methodology lies in the fact that it proposes quick and straightforward tools, ensuring to consider all the different stakeholders' perspectives in the decisional process. On the other hand, a possible drawback can be identified in the fact that the elaboration of the information from interviews and questionnaires requires the intervention of a technician, thus introducing potential biases in the process and reducing the level of transparency. This issue can be easily tackled by keeping in contact with the different stakeholders after the first interaction and discussing with them the results of the process of elaboration, to ensure that their opinions are heard.

Furthermore, if compatible with the timing for the design process, this methodology can be integrated with some participatory tools, thus making participation more effective by

[1] In the Italian context there are several experiences of spontaneous return to rurality, as reaction to the hustle and bustle and the consequent discontent related to urban life. See as reference the experiences from Val Borbera between Piemonte and Liguria Region (Martinelli, 2020).

[2] Several projects, placing rural heritage enhancement and rural communities' development have been carried out trough EU funding. Among these are worth mentioning: the Project "*SIMRA – Social Innovation in Marginalized Rural Areas*", http://www.simra-h2020.eu/, last access 16/11/2020. funded through the research and innovation European Program "Horizon 2020; the Project "*RURITAGE – Heritage for Rural Regeneration*", funded through the Program "Horizon 2020", https://www.ruritage.eu/, last access 16/11/2020; the Project "*READ IT - Rural European Association Development Innovation Team. Active citizens in rural areas*", funded through the European Program "Erasmus+", http://ruralareas.eu/, last access 17/11/2020.

engaging the different stakeholders not only in the definition of drivers for the design but in the process of design itself. Indeed, although this integration requires a more significant effort, it also allows strategies applied to the rural landscape to gain effectiveness and support.

Finally, the methodological framework, defined for Pantelleria historical rural landscape, can be exported to other territorial contexts by identifying the relevant stakeholders in the community to address and structuring the questionnaires and the interviews on the actual features and issues of the area under investigation. Thus, it can stand as a user-friendly tool to include the stakeholders' perspectives in the decisional processes for *fragile* territorial contexts, as historical rural landscapes might be. As the case of Pantelleria can be assumed as "pilot" in the context of this contribution, one of the possible further research lines could be the application and investigation of the methodology presented on minor island in similar contexts, in Italy and abroad[3].

The paper is the result of the mutual collaboration among the authors. 1. Introduction: F.V.; 2. The methodology M.R.; 3. Results, 4. Discussion: M.R.; F.V.

[3] As reference, the *National Catalogue of Historical rural landscapes* in Italy has identified the rural landscape of Asinara (Sardinia), besides Pantelleria (Dettori, 2013)

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LA COMMUNAUTÉ PATRIMONIALE VAUDOISE, ENTRE PHÉNOMÈNES DE VIVACITÉ CULTURELLE ET DÉPEUPLEMENT

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Le hameau de Balsiglia (Massello, Turin), où se trouve l'école-musée construite en 1889 (photo de l'auteur, 12/07/2020)..

Piedmonts' valleys of Chisone, Pellice and Germanasca (TO) are known as the Waldensian Valleys, due to the presence of this Christian minority in the area. The forced settling of the Waldenses in these territories (XVI-XIX centuries) has historically allowed – and still allows today – to read the area's landscape and cultural heritage symbolically.
At least since the end of the XIX century, this aspect has led to conservation policies aimed at safeguarding this community's identity, largely implemented by Waldensian cultural institutions.
This contribution intends to shed light on some characteristic aspects of the Waldensian community which influence the conservation of cultural heritage. These elements constitute the foundation of a sharing framework between safeguard organizations and citizen, which often become a veritable "heritage community", in which conservation is not seen as just a per-need action or approach but becomes part of everyday life.

Keywords : communauté patrimoniale vaudoise, conservation, heritage

Avant-propos

Le patrimoine culturel, comme en témoigne désormais une vaste littérature influente, est devenu l'objet d'une attention transdisciplinaire qui met en relief sa relation étroite avec la société civile et politique, en exhortant les chercheurs à s'interroger sur le rôle qu'il joue dans l'identité et sur le poids des populations dans la reconnaissance et la conservation du patrimoine. Ces thèmes font également l'objet de réflexions et de réexamens dans le domaine de la restauration, comme en témoignent les dernières conférences et les essais publiés dans des revues nationales et internationales[1], ainsi que l'attention croissante portée à ces enjeux par les Chartes de la Restauration[2] et les Conventions internationales[3]. Parmi ces dernières, en particulier, la *Convention pour la protection du patrimoine culturel immatériel* de l'UNESCO (Paris, 2003) et la *Convention-cadre du Conseil de l'Europe sur la valeur du patrimoine*

[1] Pour ne citer que quelques exemples significatifs plus récents, dans le contexte italien, nous rappelons le I^er^ et le II^e^ Congrès national SIRA «RICerca / REStauro» e «Restauro. Conoscenza, Progetto, Cantiere, Gestione»; parmi les revues, le travail de réflexion, de sollicitation et d'orientation d'«ANANKE» et de «Materiali e Strutture».
[2] D. Fiorani, *Carte (del restauro), Abbecedario minimo per il Restauro, oggi. Parte prima (a-c)*, dans «ANANKE», n. 72, mai 2014, pp. 37-41.
[3] C. Dezzi Bardeschi, *Convenzioni internazionali, Abbecedario minimo per il Restauro, oggi. Parte prima (a-c)* cit., pp. 55-57.

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

culturel pour la société (Faro, 2005) semblent avoir changé définitivement des acquis largement sédimentés, en marquant un passage des aspects matiéristes aux aspects perceptifs et en passant d'une idée de protection centrée sur le bien culturel à une idée centrée sur le thème de la communauté[4].

En ce sens, la minorité religieuse vaudoise peut être considérée comme le précurseur et l'ancêtre de ces thèses, car son patrimoine est traditionnellement considéré comme un catalyseur de mémoire et d'identité ; de plus, la communauté a souvent été (et elle l'est encore aujourd'hui) l'élément discriminant pour sa reconnaissance et sa conservation.

Nés dans le sillage des dissidences chrétiennes du XII^e^ siècle, présents dans la péninsule italienne à partir du siècle suivant et adhérant à la Réforme au XVI^e^ siècle, les Vaudois «représentent le noyau historique du protestantisme italien»[5]. Évangélique et presbytérienne, leur Église est organisée selon un modèle communautaire qui n'est pas hiérarchique mais collégial et gère ses activités à travers des formes d'assemblées de niveau territorial différent. Les assemblées nationales sont appelées synodes[6] et ont lieu une fois par an à Torre Pellice (Turin). L'expression directe de l'activité synodale est la Table Vaudoise, un conseil de direction élu qui a, parmi tant d'autres, la tâche de représenter les églises dans les relations avec l'Etat et avec les organisations œcuméniques. Actuellement, les membres des Églises vaudoises sont environ 45 000, répartis en trois groupes très similaires du point de vue numérique : un tiers en Amérique du Sud et deux tiers en Italie ; parmi eux, environ la moitié sont localisés au pied des Alpes Cottiennes, dans les trois vallées de la région de Pinerolo (vallées Pellice, Chisone et Germanasca). Dans le contexte évangélique italien ces trois vallées sont généralement appelés «les vallées», alors qu'à l'extérieur de ce contexte religieux-territorial, on leur attribue habituellement le terme spécifique de «vaudois».[7] Cette communauté réformée qui vit dans ces lieux et qui est caractérisée par une présence importante[8], organisée et reconnaissable dans ses

[4] Sur le sujet voir D. Fiorani, *Materiale/immateriale: frontiere del restauro*, dans «Materiali e strutture», n. 5-6, 2014; E. Romeo, *Quale storia e quali teorie del restauro nell'era della globalizzazione culturale?*, dans D. Fiorani (sous la direction de) *RICerca/REStauro*, Roma 2017, pp. 134-144; A. Pane, *Per un'etica del restauro*, dans *Idem*, pp. 120-133; M. Montella, P. Petraroia, D. Manacorda, M. Di Macco, *La Convenzione di Faro e la tradizione culturale italiana*, dans P. Feliciati (sous la direction de), *La valorizzazione dell'eredità culturale in Italia*, Macerata 2016, pp. 13-36.

[5] Bruna Peyrot, *La roccia dove Dio chiama. Viaggio nella memoria valdese fra oralità e scrittura*, Sala Bolognese (BO) 1990, p. 15.

[6] Le Synode est «la plus haute autorité humaine de l'Église en matière doctrinale, législative, juridictionnelle et gouvernementale» et représente «l'assemblée générale qui exprime l'unité de toutes les Églises» (Discipline Valdesi, art. 27).

[7] Tournoi de Giorgio, *Le valli valdesi*, Torino 2005. Sur ce sujet voir aussi Marco Fratini, *Una frontiera confessionale. La territorializzazione delle Valli valdesi del Piemonte nella cartografia del Seicento*, dans Alessandro Pastore (sous la direction de), *Confini e frontiere: un confronto fra discipline*, Milano 2007.

[8] Environ un tiers des habitants des vallées Pellice, Chisone et Germanasca sont vaudois ou ils ont des racines culturelles qui peuvent être associées aux vaudois.

institutions, organes administratifs et culturels, ainsi que par l'histoire et le périmètre géographique identifiable ou reconstructible[9], sera lue et interprétée à travers le filtre de la définition de *Convention de Faro* de «communauté patrimoniale», dont les membres sont soumis à des droits et à des devoirs concernant le patrimoine culturel.

Les Vaudois des Vallées : dynamiques de patrimonialisation et institutions culturelles

Le mouvement vaudois est un mouvement chrétien né autour de la figure de Vaudès de Lyon vers 1170 ; malgré la déclaration d'hérésie en 1184, le mouvement se répand rapidement dans une large partie de l'Europe[10] et, depuis le début du XIII^e^ siècle, il est accrédité dans les vallées alpines de la région de Pinerolo, où il professe dans la clandestinité[11]. Les Vaudois, qui entrent dans la famille réformée en 1532 (Synode de Chanforan), obtiennent en 1561 l'opportunité d'officier publiquement leurs cultes dans le duché de Savoie, mais seulement dans des endroits précis, parmi les plus périphériques des Vallées (le soi-disant «ghetto»)[12]. Touchés à plusieurs reprises par des persécutions (surtout au XVII^e^ siècle, quand ils sont contraints à l'exil en Suisse, d'où ils reviennent avec une marche épique connue sous le nom de «Glorieux Rapatriement» de 1689), ils n'accèdent aux libertés civiles et politiques qu'en 1848, grâce aux Lettres Patentes de Charles-Albert, qui sanctionnent également la fin de leur confinement. A partir de ce moment commence une activité intense de redéfinition communautaire et d'ouverture vers l'extérieur (Italie en premier lieu, mais aussi en Amérique du Sud, à cause des migrations)[13], suivant une dialectique entre local (les Vallées, incarnation du passé et de la mémoire) et national / international, qui persiste encore aujourd'hui[14]. Cette activité a intensifié la prise de conscience du patrimoine culturel communautaire, élu comme «point de référence, physique et spirituel pour garantir un lien avec son passé qui coïncide avec les lieux où il s'est produit»[15]. Pour cette raison naît la «Société d'Histoire Vaudoise » (1881, depuis 1935 «Société d'Etudes Vaudoises ») qui, depuis sa fondation,

[9] Dans ses siècles d'histoire «l'organisation ecclésiale coïncidait nécessairement avec l'organisation civico-municipale, donnant [...] naissance à une micro-société protestante, dont le caractère relativement homogène est encore aujourd'hui reconnaissable parmi ses héritiers légitimes». B. Peyrot, *La roccia dove Dio chiama* cit., p. 17.
[10] GG Merlo, *Eretici ed eresie medievali*, Bologna 1989, p. 49 et suiv.
[11] G. Tourn, *I valdesi. La singolare vicenda di un popolo-chiesa*, Torino 2008, p. 63 et suiv.
[12] D. Tron, *La definizione territoriale delle Valli valdesi dall'adesione alla Riforma alla Rivoluzione francese*, dans «Bollettino della Società di Studi Valdesi» n. 189, décembre 2001, pp. 7-8.
[13] E. Tron, E. Ganz, *I valdesi nella regione rioplatense*, «Opuscolo del XVII febbraio», Torino 2008.
[14] G. Tourn, *Dai miti al patrimonio. Percorso di una identità*, dans D. Jalla (sous la direction de), *Héritage(s). Formazione e trasmissione del patrimonio culturale valdese*, Torino 2009, p. 36.
[15] D. Jalla, *Il patrimonio culturale delle Valli valdesi*,dans D. Jalla (sous la direction de), *Héritage(s)* cit., p. 15. La reconnaissance des lieux historiques a eu ses prodromes grâce aux visites de voyageurs britanniques dans les Vallées entre la fin du XVIIIe et le début du XIX^e^ siècle. Sur ce sujet voir G. Tourn(sous la direction de),*Viaggiatori britannici alle Valli valdesi (1753-1899)*, Torino 1994.

Le feu de joie du 17 février à Sibaud (Bobbio Pellice), une occasion de fête, de réflexion et d'agrégation intergénérationnelle pour la communauté vaudoise (photo d'Elena Rudiero, 16/02/2018).

se donne pour mission de préserver et de valoriser la mémoire vaudoise à travers l'organisation d'archives et de bibliothèques. La contribution de la Société a permis de reconnaître et de signaler plusieurs Sites Historiques, symboles actualisateurs de la communauté[16]. Sa première intervention publique a été la mise en place du *Musée Vaudois* de Torre Pellice, à l'occasion du Bicentenaire du Glorieux Rapatriement (1889), destiné à la conservation du patrimoine et de la mémoire culturelle des Réformés des Vallées. Cet événement exprime un trait caractéristique de la patrimonialisation vaudoise, c'est-à-dire la correspondance entre initiatives culturelles et la célébration des anniversaires importants de son histoire : outre la fondation du *Musée* et son réaménagement (1939 : 250 ans du Glorieux Rapatriement ; 1974: 800 ans de la fondation du mouvement vaudois ; 1989 : troisième Centenaire du Glorieux Rapatriement), d'autres exemples sont la monumentalisation des sites historiques de Sibaud et de Balsiglia (1889) et de Chanforan (1932, quatrième centenaire de l'adhésion à la Réforme)[17]. Parallèlement aux actions sur le patrimoine culturel, la Société s'est également engagée dans des activités d'édition et de diffusion, caractérisées par des styles divers et adressées à différents utilisateurs : aux revues savantes et académiques, comme le «Bulletin de la Société d'Etudes Vaudoises» (publié à partir de 1884)[18], aux côtés d'ouvrages rationalisés à vocation pédagogique, comme l'«Opuscule du XVII février», distribué à l'occasion des commémorations annuelles pour célébrer l'Emancipation (les Lettres Patentes furent accordées le 17 février 1848). Depuis 1848, presque sans interruption, les Vaudois fêtent à cette date l'obtention des droits civils à travers les cultes et les célébrations communautaires, y compris le feu de joie).

[16] D. Jalla, *I luoghi della storia valdese*, «Opuscolo del XVII febbraio», Torino 2010.
[17] D. Jalla, *Il museo storico valdese di Torre Pellice*, dans A. Cavaglion (sous la direction dei), *Minoranze religiose e diritti. Percorsi in cento anni di storia degli ebrei e dei valdesi (1848-1948)*, Milano 2001, pp. 33-54.
[18] Devenu en 2017 «Riforma e movimenti religiosi. Rivista della Società di Studi Valdesi».

Si, au cours de ces premières décennies, les actions culturelles ont été promues et coordonnées au niveau central - directement ou indirectement - par l'Église, à partir de l'après-guerre c'est l'initiative spontanée des églises locales qui anime le panorama patrimonial des vallées vaudoises. Pour endiguer aussi l'appauvrissement de la civilisation montagnarde, de petits musées, dont la plupart de nature historico-ethnographique, sont réalisés dans plusieurs localités des Vallées. Dans ces musées l'histoire vaudoise se mêle avec la vie rurale (le premier musée est celui du village de Rorà, 1954)[19]. Une nouvelle activité de coordination centralisée s'avère nécessaire à cause de la multiplication des pôles culturels et mène à la création du «Comité des sites historiques» (1977) et de la Fondation Centre Culturel Vaudois (1989)[20], établie par la volonté de la Table Vaudoise et de la Société d'Etudes Vaudoises dans le but de conserver et de gérer le patrimoine de manière unitaire. La naissance de la Fondation coïncide avec le projet de création d'une structure pour la valorisation du patrimoine culturel vaudois dans son ensemble, qui prévoit la relocalisation de toutes les activités dans un seul bâtiment, le Centre Culturel Vaudois. Ce dernier abrite actuellement les archives, la bibliothèque de la Table Vaudoise et celle de la Société des Etudes Vaudoises, le musée historique et ethnographique. Le «Système muséal éco-historique des vallées vaudoises», structuré dans les formes actuelles suite à la mise en place de la «Coordination des musées et des sites historiques vaudois» (1997), qui gère 10 musées et 5 sites de mémoire des vallées[21], est donc créé. Ces institutions ont ensuite été rejointes par le Bureau des services éducatifs, les visites guidées, la formation «il barba» (1999, qui fait partie de la Fondation) et, récemment (2014), le Bureau des biens culturels de la Table vaudoise. Les compétences du Bureau des services éducatifs s'articulent sur trois points : les services éducatifs ; la formation permanente des bénévoles, qui supportent le bureau dans l'accueil, l'accompagnement des groupes et la réalisation des ateliers ; les visites guidées de musées, temples et sites historiques[22]. Le Bureau des biens culturels a pour mission de coordonner et de développer l'activité liée au patrimoine culturel des églises méthodistes et vaudoises[23] et des institutions

[19] G. Tourn, *Storia del sistema museale delle Valli valdesi*, dans *Sistema museale delle Valli Valdesi*, Fondazione Centro Culturale Valdese, 2010, p. 7; D. Jalla, *Il museo storico valdese di Torre Pellice* cit., pp. 46-47. Ces pôles peuvent être considérés comme des écomusées *ante litteram* et la plupart d'entre eux ont changé en prenant cette forme au fil des ans.

[20] http://www.fondazionevaldese.org/fondazione-valdese.php# .

[21] D. Sommani, *Musei, templi e luoghi storici valdesi. Percorsi di identità e confronto*, dans V. Minucciani (sous la direction de), *Musei fra immanenza e trascendenza. Esposizioni e raccolte di arte sacra e beni culturali religiosi in Piemonte e Valle d'Aosta*, Milano 2005, pp. 47-52.

[22] N. Favout, *Raccontare i valdesi: esperienze e sfide della divulgazione culturale*, dans S. Peyronel Rambaldi (sous la direction de), *Identità valdesi tra passato e presente*, Torino 2016, pp. 245-259.

[23] En 1975, un pacte d'union a été signé en vertu duquel l'église vaudoise et l'église méthodiste - tout en conservant chacune leur physionomie et leurs systèmes - ont été intégrées dans une seule assemblée synodale ; la gestion des deux églises est synergique même en matière de biens culturels.

associées, en synergie avec le MiBACT[24]. Ce bureau est le promoteur et le créateur du système d'information ABACVM (Archives des Biens et des Activités Culturelles Vaudoises et Méthodistes) pour l'inventaire, le catalogue, la communication et la valorisation *en ligne* patrimoine, dont fait partie intégrante le «Portail du patrimoine culturel méthodiste et vaudois», point d'accès unifié au catalogue et aux données descriptives[25].
En résumé, on peut dire que c'est principalement la Société des Etudes Vaudoises (assistée par le «Comité des sites historiques») qui s'est occupée de conservation et de valorisation du patrimoine vaudois jusqu'en 1989, tandis qu'à partir de cette année-là la fonction a été exercée par la Fondation Centre Culturel, à laquelle le Bureau des biens culturels s'est ajouté récemment. Néanmoins, les activités de ces organismes ont été (et elles le sont encore) validées par la Table.

Événements historiques et vie quotidienne : la «communauté patrimoniale» vaudoise entre processualité et complexité

Les politiques de reconnaissance, de conservation et de valorisation des biens culturels communautaires mises en œuvre par les institutions vaudoises sous-tendent, à mon avis, une profonde convergence entre factualité historique (interprétée et réinterprétée) et patrimoine. Cependant, la «communauté patrimoniale» vaudoise se caractérise, plus que par ses actions sur le patrimoine ou parallèles à celles-ci, par des éléments partagés et persistants, principalement attribuables à des facteurs historiques et éthico-religieux et déclinés ensuite sur le plan social, à travers des modes d'organisation de la vie collective. Ces éléments sont : la processualité de l'identité et de la mémoire ; l'utilisation, pour la gestion communautaire, du mécanisme d'assemblée (qui pourrait être défini comme synodalité ou parlementarisme), expression d'une démocratie élective et participative ; la forte conscience et l'application du principe de la responsabilité personnelle ; un recours constant à l'éducation et à la formation, continues et permanentes.
La condition de minorité religieuse, longtemps dépourvue de droits civils et politiques fondamentaux, a certainement produit chez les Vaudois des dynamiques de conscience très marquées ; l'histoire joue un rôle fondateur et refondateur pour les évangéliques des Vallées et le recours systématique à l'histoire pour ne pas perdre le sens de leur présence dans un contexte majoritaire a permis à cette identité de se centrer sur l'histoire, au moyen de processus médiés logiquement par la mémoire[26]. L'identité vaudoise est

[24] MiBACT, *Protocollo di collaborazione tra il Ministero dei Beni e delle Attività Culturali e del Turismo e la Tavola valdese in attuazione dell'articolo 17 della Legge 11 agosto 1984, n. 449.*
[25] http://www.patrimonioculturalevaldese.org/it
[26] B. Peyrot, *La roccia dove Dio chiama* cit., p. 287.

solidement forgée sur l'organisation de l'Église et liée à une tradition écrite qui, grâce également à une activité de publication répandue et soutenue par des pratiques communautaires (par exemple, la fête du 17 février et ses «Opuscules») veille à ce que les principaux événements de l'histoire des Réformés soient connus au moins occasionnellement par tous les membres de la communauté, et servent de base d'actualisation pour les évaluations éthiques[27].

Aujourd'hui, probablement, l'Église au sens strict n'est plus le point focal ni le seul pôle de socialité; pour cette raison, ses émanations culturelles ont accru leur rôle de médiation, de formation et de direction, en atténuant la dilution identitaire des dernières décennies. Compte tenu de leurs activités, qui visent à établir et à mettre au service des communautés un patrimoine du territoire, ces émanations exercent, outre la fonction de conservation et de valorisation, une action de sensibilisation et d'encouragement à la citoyenneté, les formes participatives étant moins spontanées que par le passé. Les initiatives reposent sur une conception systémique du patrimoine et elles sont soutenues par plusieurs formes de publicisation : un exemple est le magazine «La beidana» (1985), ainsi que certains projets sur Internet, comme le «Dictionnaire Biographique en ligne des protestants en Italie»[28]. Le mélange d'outils et de méthodes de diffusion, différents selon le public et les langages utilisés, a permis à l'histoire d'être toujours présente de manière diffusée dans l'univers vaudois, notamment dans celui des Vallées, non seulement sous forme de connaissance, mais aussi de processus. En effet, les célébrations annuelles comme le 17 février sont encore une occasion de réflexion, d'interprétation et de participation, communautaire et non communautaire[29], tout comme les formes de valorisation telles que les Promenades historiques[30], ou bien à caractère supranational, comme le projet «Les routes des Huguenots et des Vaudois» (reconnu en 2013 comme «itinéraire culturel européen» par le Conseil de l'Europe)[31], puisqu'elles permettent de relire et de revivre l'histoire de manière expérientielle et contextuelle.

La participation de la population est un autre élément fondamental de l'efficacité des politiques culturelles vaudoises. En général, les choix de la Fondation, ainsi que ceux du Bureau des biens culturels, sont largement partagés puisque les communautés se reconnaissent dans le Synode, avec lequel elles partagent des chemins sur le plan théologique, ecclésiologique

[27] *Idem*.
[28] http://www.studivaldesi.org/dtionary/index.php .
[29] B. Peyrot, *La roccia dove Dio chiama* cit., p. 247.
[30] Les Promenades historiques consistent actuellement en une quarantaine d'itinéraires et sont «une occasion de faire sortir le conte historique des musées» (*Le passeggiate storiche*, dans «Dal Centro. Cosa si muove dentro e intorno alla Fondazione Centro Culturale valdese di Torre Pellice», février 2009, p. 8). La première, un exemple pour les promenades successives, a été organisée en 1931 par la Société Historique vaudoise, à l'occasion de son cinquantième anniversaire d'activité.
[31] http://www.lestradedeivaldesi.it/it/ .

A gauche, une partie de l'exposition liée à la transformation de la pierre au musée de Rorà. A droite, l'un des 0menoni, une installation artistique à la carrière au lieu-dit Tupinet (photo de l'auteur, 05/07/2020).

et culturel.[32] Ce résultat est la manifestation de la forme traditionnelle d'assemblée par laquelle la communauté vaudoise gère sa vie communautaire, expression du parlementarisme et de la démocratie. Ce mécanisme a mené les Vaudois à reconnaître une représentativité forte dans la forme élective et participative, en contribuant également à l'exercice du principe de responsabilité personnelle typique des Eglises réformées. Ce dernier, à mon avis, représente un autre élément distinctif de l'approche du patrimoine de la communauté des Vallées. La notion a été ramenée sur un plan élargi par le philosophe Hans Jonas à la fin des années soixante-dix du siècle dernier, avec la codification du «principe de responsabilité»[33]. Selon ce principe chacun doit prendre en considération les conséquences de ses actes en traduisant ses choix dans une vision de la conservation de la vie et donc de l'environnement dans lequel elle se développe. Même si les prémisses et les motivations ne sont pas les mêmes, la traduction des comportements et les finalités peuvent être similaires. Il est possible de dire, avec prudence, que l'attention traditionnelle de l'Église vaudoise à la conservation de l'environnement[34], les faits historiques et leurs supports commémoratifs - qui sont presque un impératif éthique - ont trouvé une contrepartie contemporaine universalisante dans l'enseignement de Jonas.
Le dernier trait marquant – à savoir le recours à l'éducation et à la formation permanente - imprègne tous les aspects qui ont été présentés, et peut être considéré comme transversal à tous les domaines de la vie vaudoise.

[32] Entretien avec Sara Rivoira, archiviste, responsable de l'Ufficio beni culturali della Tavola valdese (Torre Pellice, 20/02/2018).
[33] H. Jonas, *Das Prinzip Verantwortung*, Frankfurt am Main 1979 (it: *Il principio responsabilità. Un'etica per la civiltà tecnologica*, sous la direction de Pier Paolo Portinaro, Torino 1990).
[34] Cf. L. Tomassone, *Crisi ambientale ed etica. Un nuovo clima di giustizia*, Torino 2015.

Participer, collaborer, entretenir : formes de conservation patrimoniale et environnementale dans les Vallées

Focalisée sur son histoire confessionnelle, mais également active dans la sauvegarde des aspects ethnographiques et linguistiques, la communauté patrimoniale vaudoise a noué des collaborations fructueuses avec d'autres communautés patrimoniales présentes dans la région. Le principe de subsidiarité par lequel le système muséal éco-historique est géré permet à chacun des pôles muséaux d'établir de manière indépendante des relations avec d'autres organes culturels et administratifs, en générant au niveau local des dynamiques d'utilisation compatible du patrimoine qui contribuent à la protection de l'environnement, même dans les zones les plus reculées et les moins peuplées des Vallées. A cet égard, quelques exemples seront présentés ci-après.

Le premier est le pôle muséal de Rorà, né comme exposition temporaire en 1954 et transformé en véritable musée en 1974, année où le Consistoire de l'église vaudoise cède à la *Società di Studi rorenghi* - une association culturelle fondée l'année précédente - l'ancienne auberge de campagne (l'*Hôtel du Chamois*), pour le transformer dans le nouveau siège de l'exposition[35]. Le musée, lié depuis ses origines à la valorisation des activités traditionnelles de la région – notamment agricoles et artisanales - abrite également depuis 1999 une section de l'Écomusée de la pierre[36] ; ce dernier a été réalisé par la communauté de montagne du Val Pellice et la province de Turin en collaboration avec la *Società di Studi Rorenghi* et avec la municipalité de Rorà.

L'initiative vise à valoriser le patrimoine artisanal local centré sur le processus de transformation du gneiss lamellaire (appelé pierre de Luserna), obtenu depuis des siècles dans les montagnes de la vallée ; pour cette raison, une petite carrière désaffectée dans le lieu-dit *Tupinet* a été reliée au musée (à environ un kilomètre du village), convenablement sécurisée et mise en valeur pour faire partie intégrante de l'exposition[37]. La récupération de la carrière, conçue par une *équipe* du Politecnico de Turin, «visait à rendre lisible aux visiteurs la complexité et l'intégration des différents aspects de la culture matérielle locale dans le style de vie et dans l'identité fortement caractérisée d'une communauté à la fois montagnarde et vaudoise» ;

[35] G. Tourn, *Storia del sistema museale delle Valli valdesi* cit., pp. 18-19.

[36] Le projet en question fait partie du plus vaste panorama de l'écomusée piémontais qui comprend, entre autres, diverses réalités extractives des vallées Chisone et Germanasca (l'exemple le plus célèbre est le complexe de Prali susmentionné). Sur ce sujet, voir A. Massarente, C. Ronchetta, *Ecomusei e paesaggi* cit.; Chiara Ronchetta, Marco Trisciuoglio (sous la direction de), *Progettare per il patrimonio industriale*, Torino 2008; Antonietta Cerrato, Chiara Ronchetta (sous la direction de), *I luoghi del lavoro nel Pinerolese. Tra mulini e fabbriche, centrali e miniere*, Torino 1996.

[37] *Paesaggi di Pietra. Ecomuseo delle Cave nel Comune di Rorà, Valle Pellice*, dans Antonietta Cerrato, Antonio De Rossi, Cristina Franco (sous la direction de), *Ricerche e proposte per il Progetto Cultura Materiale*, Provincia di Torino, Torino 1998, pp. 87-91.

Le hameau de Balsiglia (Massello, Turin), où se trouve l'école-musée construite en 1889 (photo de l'auteur, 12/07/2020).
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l'intervention sur le site des carrières et du musée à l'intérieur du village «deviennent les points de départ d'un parcours - physique et figuratif - à travers l'histoire exemplaire d'un territoire alpin, de ses origines aux années les plus récentes, mettant en valeur l'entrelacement entre les modes de vie traditionnels encore présents et les processus de modernisation»[38]. Par conséquent, la même salle abrite deux musées différents, qui font partie de circuits distincts, mais fortement intégrés les uns aux autres et, en fait, complémentaires. Cette interconnexion fructueuse est également scellée par les promenades historiques organisées sur place.

Un autre champ d'application sur le patrimoine qui génère des dynamiques vertueuses de collaboration entre organismes différents est lié au projet des Guichets d'assistance linguistique pour la protection et la valorisation des langues minoritaires (activité promue grâce à la loi n° 482/1999 «Normes en matière de protection des minorités linguistiques historiques»), dont l'un est situé auprès de la Fondation Centre Culturel Vaudois et l'autre à l'intérieur de la Ecole Latine de Pomaretto[39]. Ce dernier est un centre qui

[38] Roberto Dini, *Archeologia mineraria: occasioni di architettura*, dans «ArchAlp», n. 12 - décembre 2016, p. 64.
[39] Le projet, dirigé par l'Unione Montana del Pinerolese et l'Unione Montana Valli Chisone e Germanasca, prévoit plusieurs types de guichets linguistiques, y compris ceux gérés directement par les Unioni et ceux

s'occupe de culture matérielle et de langues minoritaires, dans le but de «préserver la mémoire de la vie à la montagne (établissements et activités des habitants, utilisation du territoire, relations sociales et institutionnelles, langue et communication, histoire et culture, etc.)» et d'«offrir des occasions de réflexion sur les liens passé-présent-futur, basés sur l'étude, la recherche et l'approfondissement de la culture locale »[40]. La Fondation, qui conformément à ses statuts est «apolitique et non confessionnelle», agit «en collaboration avec les autres réalités culturelles de l'Église vaudoise des Vallées [...] dans le but de promouvoir la protection et la sauvegarde des témoignages de l'identité historique vaudoise et de la culture locale»[41]. Organisatrice de conférences annuelles et des promenades historiques, également tenues en occitan et en français, l'École Latine coopère en permanence avec «l'Écomusée des mines du Val Germanasca»[42] (dont elle fait partie intégrante), principalement pour ce qui concerne les aspects ethnographiques[43], en promouvant aussi des visites guidées en langue au pôle muséal ScopriMiniera à Prali (Turin). Ce village abrite un autre musée vaudois ainsi que le site historique de Pra Daval, où se déroula le Synode de 1533 qui confirma l'adhésion à la Réforme prononcée l'année précédente à Chanforan. Bien que ce site ne soit pas appartenu directement à l'Église jusqu'à une époque récente, le Comité des Sites historiques a garanti pendant des années son entretien et l'a mis en valeur au moyen d'un entretien constant (tonte des prairies, nettoyage des sentiers, pose de panneaux) et la pose en 2013 d'un petit monument commémoratif. C'est un autre aspect important du système muséal éco-historique vaudois, à savoir l'entretien du contexte dans lequel les sites et les musées sont insérés. En ce sens, il est intéressant de signaler le cas de Balsiglia, où se trouve l'École-musée bâtie en 1889 à l'occasion des célébrations du rapatriement. Balsiglia est un hameau de la commune de Massello, qui compte aujourd'hui 53 habitants[44], presque tous concentrés dans le chef-lieu. Ce petit hameau est principalement vécu de façon épisodique par des

décentralisés. Ces derniers sont gérés par des commissionnaires, qui réalisent les différentes activités dans la pratique, en fournissant des conseils et des traductions à des organisations, institutions, particuliers, etc. Chaque soumissionnaire retenu a une compétence sur une zone géographique spécifique, en particulier l'Association "Amici della Scuola Latina" pour le Val Germanasca et le bas Val Chisone et la Fondazione Centro Culturale Valdese pour le Val Pellice et les communes du piémont.

[40] http://www.scuolalatina.it/home.html .

[41] Statuts de l'Association "Amici della Scuola Latina", art. 2 (http://www.scuolalatina.it/pdf/STATUTO%20S.L._16-3-9.pdf).

[42] Reconnu en 2003 par la Région Piémont, l'Écomusée est né dans les années 90 du siècle dernier de la nécessité et de la volonté de préserver et de valoriser le patrimoine minéral du territoire, en état d'abandon et de déclin progressifs. A cet effet, en 1998 a été inauguré Scopriminiera, qui comprenait une visite guidée dans le sous-sol de la mine Paola de Prali, convenablement restaurée et re-fonctionnalisée. A partir de ce premier pôle, au fil des ans, les collaborations avec les institutions culturelles de la région se sont intensifiées et enrichies et impliquent maintenant plusieurs musées vaudois (http://www.ecomuseominiere.it/ecomuseo/progetto-ecomuseo-val-germanasca/).

[43] L'Ecole Latine accueille à son intérieur l'exposition permanente «métiers anciens», composée de plus de 150 maquettes («Collection Ferrero») qui illustrent des scènes de la vie montagnarde et paysanne (http://www.ecomuseominiere.it/territorio/musei/#1454930097927-e8e189e3-7732).

[44] Données Istat.

personnes originaires du village qui ont déménagé dans des villes plus riches en services, comme Pinerolo. Néanmoins, non seulement le musée est ouvert selon des horaires précis, mais aussi ses abords sont entretenus grâce au travail bénévole des anciens habitants émigrés vers le fond de la vallée et de leurs familles.

Cette série d'exemples pourrait être résumée en affirmant que le système muséal vaudois, en agissant en synergie avec d'autres organes culturels et administratifs, contribue à maintenir non seulement son patrimoine et le patrimoine ethnographique des Vallées, mais aussi l'environnement qui, quotidiennement ou de manière plus sporadique, fait l'objet d'une activité de conservation et d'entretien. Cette activité est mise œuvre non seulement par les résidents (qui dans certains cas sont très peu nombreux), mais aussi par ceux qui vivent maintenant dans des centres plus peuplés et qui, par tradition et sens de responsabilité, se sentent investis d'une tâche de conservation à laquelle ils attribuent une valeur éthique.

Gino Lusso affirmait que les Vallées pouvaient être interprétées, entre autres, à travers une valeur symbolique, ce qui aurait permis de les voir comme «le support spatial de leur composante historiquement significative». Suivant ce critère, les éléments prépondérants auraient été les «modes de vie collective [...], vécus comme un patrimoine qui vient du passé, mais qui prend de la valeur dans la mesure où il est vécu dans le présent». Cependant, ces éléments n'auraient pas dû être considérés comme des aspects muséaux, à admirer sans critique, mais comme «des modèles de vie communautaire qui veulent respecter des principes valables depuis plusieurs siècles».[45] Personnellement, je crois que ces «modèles» peuvent être considérés comme un exemple de gestion fructueuse de l'héritage culturel puisque, à mon avis, la conservation peut s'affirmer comme valeur éthique si elle repose sur une pratique quotidienne et sur une participation consciente.

[45] G. Lusso , *Il territorio come patrimonio*, dans D. Jalla (édité par), *Héritage (s)* cit., p. 120.

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TERRITOIRES EN DÉCLIN : CHANGEMENTS DÉMOGRAPHIQUES ET CRISE DES CŒURS DE VILLES ET VILLAGES DE L'INTÉRIEUR DE LA SICILE

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En haut, vue sur Petralia Soprana et Madonnuzza. En bas, vue sur Madonnuzza de Petralia Sopran.

In Sicily, the phenomenon of depopulation is marked by twofold trend: on the one hand the exodus to foreign countries or other Italian regions, on the other hand the regional migratory flows which favour coastal and large metropolitan areas at the expense of towns and villages in disadvantaged internal areas. Strongly rooted in their environment, these areas have been overwhelmed by a deregulated metropolisation and strongly affected by the socio-economic crisis. Moreover, development models and new housing standards led to the loss of attractiveness of the historical centres, even when the rest of the town remained relatively dynamic.
Recent studies show that depopulation is only one of the causes of the crisis, which has now reached a planetary dimension: the lack of self-sufficiency, residential and commercial vacancies, ageing and a poorly differentiated residential offer are factors with contribute to the disaffection towards the historical areas.
The ongoing research here presented aims to examine the dynamics of depopulation and their repercussions on the built heritage through a comparison between three case studies : Motta Camastra, a small village in the province of Messina; Petralia Soprana, a larger village in the area of the Madonie Mountains in the province of Palermo and the ancient town centre of Leonforte, in the province of Enna. Following the growing interest in the return to small towns, as a model of human scale communities, the discipline of conservation may contribute to go beyond the issue of the physical conservation of the historic urban heritage, while taking into account the unease that weighs on the whole urban environment and the fragile territories.

Keywords: Sicilian interior areas, depopulation, built heritage, restoration, historic centers

Introduction

Depuis le confinement et la crise sanitaire, le repeuplement des terres intérieures et le possible retour aux villages oubliés sont devenus des questions centrales dans la réflexion en cours sur l'avenir de notre pays. Le débat s'est articulé à travers de nombreuses propositions : si certains ont tenté de concilier des sujets comme la réutilisation du bâti existant et la nécessaire valorisation du patrimoine architectural [Italia Nostra 2020; Settis 2020], d'autres ont continué à privilégier une vision esthétisante des petits villages, perçus comme refuge temporaire à l'utilisateur quotidien des grandes villes. D'autre part, même la sur-utilisation du terme impropre de "borgo"- terme italien qui étymologiquement indique une citadelle

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fortifiée, mais désormais largement entré dans le langage commun - encourage l'aspect féerique et artificiel des différentes agglomérations et ne restitue pas l'extrême hétérogénéité du système urbanistique italien. Le nom de "borgo", souvent utilisé par opposition à ville métropolitaine, encourage une vision dichotomique des territoires au détriment d'une idée coopérative [Mascino, De Rossi 2020), et rétrécit la signification hétérogène du terme ville, qui inclut une pluralité de modalité d'être des villes [Carta 2020].

En Italie, dans le cadre d'une prise de conscience de l'importance de la diversité urbaine, le sujet de la revitalisation démographique dans ces lieux a trouvé une nouvelle actualité grâce à la SNAI (Strategia Nazionale delle Aree Interne), une initiative gouvernementale entamée en le 2014 dans le but de dynamiser les territoires italiens isolés et à l'abandon. En s'élargissant par rapport à l'indication traditionnelle et limitée du terme "borgo" ou de locutions comme "zones de montagne", "collinaires", "rurales", la dénomination "aires intérieures" sous-entend non seulement une situation géographique désavantagée, mais également une fragilité due à la pénurie et à la distance des services considérés comme essentiels pour la communauté (Strategia Nazionale Aree Interne 2014). Cette initiative du côté italien s'inscrit dans un contexte européen plus large qui témoigne d'une sensibilité croissante au phénomène du dépeuplement et des conséquences sur le sort des centres historiques, particulièrement menacés par l'exode massif des habitants. En France, le plan « Action cœur de ville », lancé en 2018, révèle une approche moins déterminée par le poids démographique où la crise des villes moyennes est analysée en lien avec leur profil fonctionnel au niveau urbain et territorial.

A la lumière des expériences de réhabilitation en cours, comment répondre à la nécessité de conjuguer la relance du rôle de la ville historique avec sa conservation ? La recherche en cours s'interroge sur le rôle de la discipline de conservation du bâti dans le processus de réappropriation du patrimoine culturel, un passage obligé dont dépendent à la fois la réactivation des pratiques d'entretien et la redécouverte des relations urbaines et territoriales [Oteri 2019]. Dans un éventail de réponses possibles au problème, la discipline de la conservation peut contribuer à examiner les possibilités de valorisation et de revitalisation des tissus urbains en vérifiant également selon quelles modalités la ville historique peut encore offrir des chances pour rééquilibrer la politique d'aménagement du territoire. Les premiers résultats de la recherche, présentés dans cette contribution, visent à connaître les dynamiques de dépeuplement en cours dans les aires intérieures siciliennes et leurs effets sur la conservation des tissus historiques.

Le dépeuplement en Sicile

Avec son fort caractère urbain, le territoire italien se distingue par une multitude diffuse et connectée de petites villes et villages. Dans ce contexte multiforme, la Sicile présente une physionomie qui, sous certains aspects, diffère des autres régions italiennes. L'enquête sur le nombre de communes et leur dimension démographique[1] nous renvoie un premier aperçu de la structure d'implantation urbaine. En comparant la Sicile à 4 régions ayant une extension territoriale analogue[2], la Lombardie et le Piémont montrent une importante fragmentation administrative (le Piémont compte 1197 communes, la Lombardie 1516), alors que la Sicile, avec un nombre total de 390 communes, montre une situation similaire à la Sardaigne (377) et à la Toscane (274). Un regard sur la dimension démographique des communes siciliennes éclaire le cadre : la taille prédominante des communes est de 1000 à 5000 habitants (44% par rapport au total), alors que seul 15% des communes comptent plus de 20000. La concentration des communes avec une population inférieure à 1000 habitants est d'environ 9% (36 communes), tandis qu'en Piémont – une région avec une population totale comparables à la Sicile - ce chiffre atteint 50% (602 communes). Les analyses présentées renvoient à cette forte dimension urbaine mise en évidence dans les études historiographiques et géographiques sur la Sicile. L'expression "terre de villes" [Iachello, Signorelli 1987, 89], choisie pour décrire la Sicile du XIXe siècle, dénote une articulation territoriale avec des agglomérations moyennes et grandes situées non seulement sur la côte, mais aussi dans l'arrière-pays en dépit de son caractère principalement rural.

À la lumière de ce premier cadre quantitatif sur le poids démographique des communes, quelles sont les dynamiques de courte et de longue durée ? Quels sont les risques que ces dynamiques engendrent par rapport à la conservation de la structure de l'habitat historique ?

L'émigration et l'abandon, phénomènes corrélés entre eux, trouvent leur origine, dans l'histoire moderne, après l'unification de l'Italie, lorsque l'ensemble du territoire est touché par un développement rapide. À ces transformations sont liés les flux migratoires massifs vers l'extérieur du territoire régional, d'abord tournés vers le continent américain, puis, dans l'après-guerre, principalement dirigés vers l'Europe continentale et l'Italie septentrionale. Avec un flux d'environ 2,2 millions de personnes de 1861 à 1971, l'émigration a transformé de façon irréversible le visage de l'île [Aymard 1987].

Conjointement aux départs hors du territoire insulaire, les mouvements migratoires internes ont pris dès l'époque post-unitaire un caractère structurel. Reconnu comme phénomène "épique" [Lanzani, Curci 2018, 79], l'exode rural des zones montagneuses et vallonnées a

[1] L'enquête est basée sur les données Istat (Istituto nazionale di statistica) mise à jour au 1er janvier 2018.
[2] Données Istat mises à jour en 2011 (https://www.istat.it/it/files//2013/02/Superfici-dei-comuni.pdf).

Fig. 1
Variations démographiques de la population résidente en Sicile (%) enregistrées de 2011 à 2018 selon le poids démographique des communes (données ISTAT).

.

frappé largement l'Italie. En Sicile, la modernisation de l'agriculture, le développement des cultures d'agrumes au détriment des terres céréalières, la centralisation urbaine et la croissance conséquente des grandes villes – en premier lieu Catane et Palerme – avec l'expansion de leurs banlieues, sont des facteurs qui concourent à l'abandon progressif des campagnes et des centres urbains de l'arrière-pays en générant "une nouvelle répartition de la population dans les espaces" [Aymard 1987, 22]. Dans cette région, la polarisation constante vers un nombre limité de centres urbains a engendré un déséquilibre territorial entre les zones côtières, où se concentrent les villes de plus grande taille et avec des économies plus flexibles, et l'arrière-pays, avec un système social et productif encore marqué par les anciennes structures territoriales et plus fragile.

La lecture de la variation démographique enregistrée au cours de la dernière décennie[3] confirme les tendances précédemment mises en évidence et témoigne de la persistance de grandes disparités au niveau territorial : alors que 79% des villes de plus de 20000 habitants sont en croissance ou en situation stationnaire, près de 90% des petites communes, avec une population inférieure à 5000 habitants, est en faible ou fort déclin. Même les communes de taille moyenne, dont la population est comprise entre 5000 et 20000 habitants, enregistrent des tendances très préoccupantes : 54% d'entre elles sont en déclin démographique (Fig. 1). En analysant les données par province, il est possible de préciser la situation : si dans l'arrière-pays, à Enna et Caltanissetta, aucune commune n'a enregistré de tendance positive de 2011 à 2018, dans les provinces de Catane et de Raguse, les communes en croissance sont nombreuses (43 % à Catane et 67 % à Raguse). En revanche, dans la province de Messine et d'Agrigente, le dépeuplement touche environ 70 % du

[3] Variations démographiques de la population résidente (%) enregistrées de 2011 à 2018 sur la base des données ISTAT.

total des communes, à Caltanissetta et Enna près de 90 %. Ces données confirment dans quelle mesure la situation géographique de l'habitat et sa situation périphérique par rapport aux grandes aires métropolitaines influencent son destin.

Les catégories de l'abandon en Sicile

Les études sur les petits centres urbains ont permis d'analyser les situations d'abandon par rapport au dégrée de diffusion et à la gravité du phénomène : abandon définitif, abandon définitif avec fondation d'un nouveau centre, abandon partiel [Bassanelli 2010; Pirlone 2016]. En partant de cette classification et en recoupant les données statistiques présentées précédemment, nous tenterons de dresser un premier tableau des situations observables dans l'île.
En Italie, au cours des dernières décennies, plusieurs recherches ont été menées pour recenser les villages à risque d'abandon ou complètement abandonnés. Cependant, malgré le nombre important d'initiatives et de projets, il n'existe pas une cartographie complète et des bases de données au niveau national[4] [Benedini 2015]. Si nous comparons les 390 communes siciliennes avec les cas d'abandon identifiés – un nombre qui varie selon les recensements mais qui pour la Sicile est toujours inférieur à 40[5] - nous pouvons en déduire que la situation d'abandon définitif peut être considérée épisodique. Dans l'histoire de la Sicile, le thème de l'abandon s'est présenté surtout à la suite de catastrophes naturelles qui ont causé la mort définitive de villages entiers ou qui ont accéléré le déclin déjà en cours de ceux difficilement accessibles. Le cas des villages ruraux réalisés dans la première moitié du XXe siècle à l'occasion de la réforme agraire, dont certains n'ont jamais été habités, est certainement différent. La seconde phénoménologie de l'abandon définitif avec reconstruction d'un nouveau centre est également rare et généralement liée à des catastrophes naturelles. Parfois, après ces événements, l'habitat a été reconstruit dans une position plus favorable. Enfin, l'abandon partiel est sans aucun doute le cas le plus fréquent.
En effet, en analysant les données les plus récentes sur la variation démographique, il apparaît que 63% des communes siciliennes ont perdu une partie considérable de leurs habitants au cours de la dernière décennie. Le dépeuplement et l'abandon partiel peuvent se présenter sous diverses formes et concerner des centres différents. Le phénomène mérite une analyse

[4] Signalons les recherches du Groupe Norman Brian et les enquêtes menées par l'École Polytechnique de Milan et par l'Université de Gênes [Bassanelli 2010 ; Pirlone 2016]. Il existe également de nombreux sites en ligne qui recensent les villages abandonnés. Le site www.paesifantasma.it rassemble une liste de nombreux cas en Italie et à l'étranger. Un autre projet d'intérêt est Vacuamoenia, une recherche visant à la narration du paysage sicilien à l'abandon à travers les sons. Les centres urbains objets de la recherche sont identifiés et localisés à l'aide d'une carte constamment mise à jour (www.vacuamoenia.net).
[5] Le recensement du groupe Norman Brian, mené dans les années 2000, a identifié dans tout le territoire sicilien 33 bourgs dépeuplés [Bassanelli 2010, 49]. La recherche de Benedini, sur un total de 182 centres totalement abandonnés identifie 14 cas en Sicile [Benedini 2015].

Fig. 2
L'abandon à Leonforte et Petralia Soprana.

plus large qui dépasse la simple subdivision selon le poids démographique. Cette analyse n'est pas aisée, car l'abandon partiel émerge des statistiques moins facilement, et peut ne concerner que certains secteurs urbains. Par conséquent, il serait opportun d'expliciter le phénomène en mettant en relation les données statistiques avec la diffusion géographique, les bâtiments concernés et leur époque de construction [Curci, Zanfi 2018]. Les enquêtes récentes sur le patrimoine résidentiel des cœurs de ville confirment que souvent les quartiers historiques souffrent de processus de marginalisation à l'échelle tant urbaine que territoriale [ANCSA, CRESME 2017]. Il semble donc opportun d'enquêter sur l'abandon partiel en relation avec la perte de la population des centres historiques, phénomène difficilement quantifiable et qui peut se présenter avec des dynamiques très différentes. Le départ des habitants touche aussi bien les zones à forte attractivité touristique ou concernées par la tertiarisation que les villes en profond déclin, où la désaffection par rapport au centre historique et sa dégradation conséquente se sont souvent accompagnées d'un développement résidentiel et commercial en dehors du centre ancien.

En laissant de côté la première phénoménologie d'abandon du centre historique qui concerne les agglomérations avec un rôle moteur et qui en Sicile correspond aux grandes aires métropolitaines et aux villes proches de la côte, la recherche en cours se concentre sur les villes et les villages des aires intérieures siciliennes (Fig. 2). Le potentiel d'inversion de la tendance en cours impose une réflexion urgente et spécifique, par rapport aux cas d'abandon définitif.

Si la pénurie d'équipements et de services essentiels, le manque d'infrastructures territoriales et les conditions d'accessibilité difficiles ont favorisé la marginalisation de certaines zones, avec une conséquence de sous-utilisation de villages entiers, dans d'autres cas, la diffusion d'une conception polycentrique de la structure urbaine a alimenté la polarisation vers des zones d'expansion et la dégradation des quartiers historiques [ANCSA, CRESME 2017]. A ces transformations s'associent souvent, outre le vieillissement de la population résidente, la dénatalité et l'absence de renouvellement des générations, l'absence d'entretien des immeubles anciens, causée par des difficultés de gestion immobilière, notamment la fragmentation de la propriété[6]. Plus généralement, apparaît une incapacité à mettre en œuvre des projets qui ne soient pas uniquement voués à la promotion de l'activité touristique, de projets qui puissent offrir des solutions adaptées aux modes d'habiter contemporains.

Une lecture de la dynamique en cours à travers les cas de Motta Camastra, Petralia et Leonforte

L'observation attentive de quelques cas d'étude permet de vérifier l'analyse quantitative présentée et de mieux préciser les phénoménologies de l'abandon partiel. La comparaison entre trois villes constitue une occasion pour examiner la variété des situations générées par le dépeuplement et de mesurer à l'échelle urbaine les effets de ces processus sur la conservation des bâtiments historiques. Motta Camastra, Petralia Soprana et Leonforte sont des exemples représentatifs de différentes situations tant sur le plan dimensionnel que territorial. Leur localisation dans les provinces de Messine, Palerme et Enna nous permet de comparer différentes zones géographiques et de clarifier les dynamiques. Motta Camastra est située au nord-est de la Sicile, sur le versant ouest de l'Etna, dans une position géographique connue pour ses richesses naturelles. La municipalité comprend Motta Camastra et deux petits villages, Fondaco Motta et San Cataldo. L'habitat s'élève sur un promontoire comme point de contrôle de la vallée du fleuve Alcantara, en relation visuelle avec Castiglione de Sicile et Francavilla. Petralia Soprana et Leonforte se trouvent en Sicile centrale : Petralia Soprana est un village de montagne située à environ 1100 mètres d'altitude sur le versant sud de la zone des Madonies, à la limite de la zone naturelle protégée du parc du même nom ; Leonforte est une ville moyenne au nord-est d'Enna, au milieu des monts Erei. Les trois villes correspondent aux trois des classes démographiques précédemment identifiées : Motta Camastra est l'une des 36 communes siciliens qui comptent actuellement moins de 1000 habitants;

[6] Sur ce sujet voir aussi le Workshop Giovani Ricercatori Aree Interne, https://www.eccellenza.dastu.polimi.it/2020/07/07/workshop-giovani-ricercatori-aree-interne-diario-di-lavoro-tavolo-del-06-luglio-2020-spopolamento-e-abbandono/.

Fig. 3
En haut, vue sur Petralia Soprana et Madonnuzza. En bas, vue sur Madonnuzza de Petralia Soprana.

Petralia Soprana fait partie de la classe des petites communes avec une population comprise entre 1000 et 5000 habitants; Leonforte, avec une population résidente d'environ 13000 habitants, appartient au cas de villes moyennes en profonde crise.

Si l'on considère l'évolution démographique depuis l'époque post-unitaire à nos jours, il apparaît que la décroissance devient une constante des trois centres urbains à partir de l'après-guerre. Sur la période allant de 1936 à 1981, Motta Camastra subit une baisse drastique : les résidents passent de 2353 à 1078. La population actuelle, qui se situe autour de 800 habitants, représente donc environ un tiers de celle enregistrée dans la période de maximum historique, dans les 10 années du siècle dernier. Petralia Soprana enregistre elle aussi son record historique dans les mêmes années, et est touchée ensuite par une importante décroissance : la population passe de 7104 habitants en 1911 à 5370 en 1931. La légère évolution démographique enregistrée au cours des décennies suivantes s'arrête en 1951. Après cette phase, la baisse constante de la population entraîne une diminution progressive jusqu'au 3242 habitants actuels.

Comme montré dans la carte des "Italies en crise ou en contraction" [Lanzani, Curci 2018], le dépeuplement de Motta Camastra et Petralia Soprana peut être associé à la crise de l'économie agricole et pastorale qui a entraîné une mutation de la vocation territoriale originelle et principalement rurale des régions montagneuses et vallonnées. L'histoire de Petralia Soprana est un exemple de ce processus qui a touché toute la région des Madonies, devenu structurel dans les années 70, lorsque l'émigration en dehors de la région s'accompagne de l'éloignement des nouvelles générations de familles paysannes vers les nouveaux pôles d'attraction sur la côte nord, en particulier l'usine FIAT à Termini Imerese et le Villaggio Club Med à Cefalù [Accordo di programma quadro Regione Siciliana, 2018]. Le déclin démographique de Motta Camastra s'explique par les processus territoriaux qui concernent les communes de crête dans l'arrière-pays de Messine. Fortement caractérisée par des petits villages situés sur les hauteurs, la province a

été touchée par un exode massif vers la côte [Nigrelli 2000]. Actuellement, la côte ionienne est sujette au risque d'une charge anthropique et met en évidence les effets de ce déséquilibre [Carocci 2008].

Si les variations démographiques de Motta Camastra et Petralia Soprana sont des exemples de certaines dynamiques typiques des centres de plus petite taille, le cas de Leonforte offre un exemple de fragilisation d'une ville moyenne [Delpirou 2019]. La croissance constante de la population atteint son maximum historique en 1921, quand on enregistre 24328 habitants, une augmentation liée au développement de l'activité minière [Vitale, Versaci 2020]. À partir des années 1950, la diminution constante porte la population à environ 13000 habitants, un nombre proche de celui du recensement post-unitaire. En regardant à nouveau la carte des "Italies en crise ou en contraction", nous pourrions ramener la contraction démographique de Leonforte à la crise de la production agricole, une condition qui touche une bonne partie de l'arrière-pays sicilien comprise entre les provinces d'Enna, Agrigente et Caltanissetta. Dans ce cas également, il s'agit d'un processus consolidé généré par l'industrialisation et la modernisation de l'agriculture qui a entraîné la réduction de l'attrait de l'emploi dans les campagnes [Lanzani, Curci 2018]. D'autre part, à Leonforte, la reconversion économique amorcée en deuxième partie du XX siècle a privilégié le secteur de l'industrie de la construction au détriment des activités artisanales, en alimentant, comme sera précisé ci-dessous, l'extension urbaine avec des répercussions sur les équilibres de la ville.

Les transformations urbaines qui accompagnent les processus de dépeuplement présentent parfois une nature complexe et contradictoire. Récemment, des études ont montré qu'en Italie l'abandon et l'utilisation de sols sont souvent corrélés et affectent les mêmes territoires [Fabrian 2017]. Dans ce contexte, les plans d'urbanisme, en privilégiant l'expansion spatiale au détriment de la réutilisation, ont eu un rôle déterminant dans la favorisation des modèles qui vont à l'inverse d'un développement durable. Les aires intérieures siciliennes ont été particulièrement touchées par ces phénomènes et souffrent aujourd'hui des effets néfastes du "développement incontrôlé des 50 dernières années" [La Greca, Martinico, Nigrelli 2020, 225].

Les cas de Petralia Soprana et Leonforte donnent matière à réflexion pour comprendre les causes et les effets de ces dynamiques. À Petralia Soprana, en parallèle à l'émigration constante de la population en dehors du territoire communal, entre les années 60 et 70 les habitations du centre ancien subissent des transformations considérables liées aux envois de fonds des émigrés [Boscarino et alii 1994]. Dans les mêmes années, un autre phénomène parallèle engendre une mutation de la structure historique du territoire, caractérisé par un grand village entouré de maisons éparses et de petits villages. A partir des années Soixante et

Fig. 4
Transformation des bâtiments du centre ancien à Leonforte, Petralia Soprana et Motta Camastra.

Soixante-dix, certaines aires initialement constituées de maisons éparses se développent largement. Si l'édification du quartier résidentiel Pinta a nuancé la frontière nord du centre ancien, en altérant aussi la relation originelle entre l'espace urbain et rural, l'expansion de Madonnuzza vers la vallée a définitivement éclipsé l'habitat historique sur la colline (Fig. 3). Situé au carrefour d'importantes routes, Madonnuzza accueille aujourd'hui la plupart des activités commerciales et des résidences, aux dépens de larges portions du centre historique qui se trouve aujourd'hui une situation d'abandon avancé [Boscarino et alii 1994].

Alors qu'à Petralia Soprana le délaissement s'est concrétisé à travers un déplacement des habitants en dehors du village, à Leonforte le polycentrisme urbain a alimenté la migration des habitants du centre ancien vers les aires de plus récente édification. En effet, l'évolution historique de la ville a déterminé la marginalisation progressive du noyau historique, posé sur une pente très raide au pied du mont Cernigliere. Les phases successives de l'évolution urbaine, du XIXe siècle au XXe siècle, ont encouragé le développement de l'habitat sur le plateau, influençant lourdement l'avenir de la ville et le destin du centre ancien. Les prévisions du plan d'urbanisme des années 70 se basaient sur l'hypothèse d'une renaissance économique du territoire, qui aurait arrêté l'hémorragie des résidents. Cette prévision optimiste - qui ne s'est pas produite - était associée à la volonté d'offrir une alternative aux habitations délabrées du centre historique. Bien qu'inachevé, le plan a influencé les choix administratifs successifs jusqu'à nos jours, avec des retombées non seulement sur le centre historique, devenu une véritable « banlieue urbaine », mais aussi pour le paysage environnant [Vitale, Versaci 2020]. Aujourd'hui, alors que le quartier ancien souffre d'un état d'abandon avancé, la nouvelle urbanisation pavillonnaire dessine un modèle urbain dispersé sans structuration claire.

Si, comme indiqué ci-dessus, les choix d'aménagement urbain et territorial peu judicieux ont parfois alimenté les processus de marginalisation des quartiers historiques, dans d'autres cas l'absence d'un outil pour gérer le centre ancien – une condition qui se rencontre largement dans tout le territoire sicilien – peut engendrer des situations contestable (Fig. 4). C'est le cas de Motta Camastra où l'on rencontre plusieurs interventions spontanées, dictées par la nécessité d'adapter les anciens bâtiments aux standards contemporains sans prise en compte des spécificités du bâti existant. Les conséquences du dépeuplement s'associent à l'absence d'un plan de réhabilitation pour le centre historique et produisent un double effet : d'une part, l'état de péril risque de toucher de plus en plus de bâtiments, notamment ceux situés en bordure de la ville, d'autre part, l'intervention de l'homme sur des portions urbaines encore partiellement habitées menace l'authenticité du bâti historique en soumettant les bâtiments à des transformations irréversibles [Carocci 2008].

Conclusions

Les récentes hypothèses sur un éventuel renversement de la tendance au dépeuplement des aires intérieures et les incitations au retour aux villes à taille humaine ont profité d'une surexposition médiatique et ont sans aucun doute encouragé une nouvelle prise de conscience de l'étendue du patrimoine bâti inutilisé et menacé. Cependant, les propositions qui encouragent les habitants de la métropole à résider, même temporairement, dans les villages risquent de rester rhétoriques et d'alimenter une vision centrée sur une vision métropolitaine [Nigrelli 2020].

La nécessité d'affronter les perspectives réelles de renaissance de certains villages a été soulignée, même de manière provocante, par des nombreuses personnalités ; cette approche ancrée sur les réalités territoriales [Nigrelli 2000] et des données économiques [Chiodelli 2020], impliquerait une récupération sélective du bâti historique. Ces hypothèses de sélection pragmatique qui impliqueraient la décision d'accepter la mort définitive de certains centres urbains ne dispense pas de la nécessité de sécuriser les bâtiments et de proposer des stratégies pour accompagner la disparition [Sebastian 2020].

Une question essentielle demeure toutefois ; celle des conséquences de ces choix sur le sort des villes toujours dynamiques. Dans ces cas l'abandon des quartiers anciens risque de devenir une plaie pour l'ensemble de l'agglomération en termes de sécurité urbaine, structurelle et environnementale, mais aussi une atteinte à l'équilibre plus général de notre culture [Benevolo, 1960].

Dans ce scénario peu rassurant, la discipline de la conservation ne peut pas éviter de réfléchir à sa contribution, en essayant de dépasser la question de la conservation physique de la ville

historique et en prenant en compte le malaise qui pèse sur les organismes urbains et les territoires les plus fragiles. Les analyses présentées reflètent l'existence de différentes dynamiques qui doivent être interprétées et encadrées dans le contexte des différentes histoires des villes et des territoires. Les spécificités des différentes études de cas mettent en évidence la nécessité de calibrer l'intervention sur la base de la connaissance de ces processus ainsi que de l'étude des tissus historiques.

La revitalisation d'un tissu urbain souvent élémentaire - caractérisé par habitations d'une ou deux élévations, ayant généralement une chambre par étage - implique également d'évaluer les possibilités de modifications même importantes de la configuration d'origine, tout en respectant ce qui a été construit au fil du temps. La discipline de la conservation peut accepter ce défi et faire partie du système d'actions pour gouverner le territoire tant qu'elle indique les limites de la transformabilité de la ville historique même dans le cadre d'une gamme d'interventions diversifiées. Dans cette perspective, la recherche est orientée pour aborder les questions liées à la relation complexe entre la conservation et la transformation des centre historiques, avec la perspective de regarder le passé et ce dont nous avons hérité comme un binaire dans lequel insérer nos choix.

Il a été souligné de toutes parts que la préservation du patrimoine, si elle s'inscrit dans un programme plus large, peut contribuer à réactiver le développement de certaines zones et peut soutenir des formes d'innovation alternatives à celles, dissipatives, promues par le courant économique dominant. De ce point de vue, la valeur du bâti historique inclut non seulement sa composante matérielle, mais aussi sa composante immatérielle et "anthropologique", en remettant en question la relation entre l'architecture, les individus et les communautés [Oteri 2019]. Cet aspect apparaît nettement plus marqué dans les tissus partiellement abandonnés, où la présence des résidents - relativement peu nombreux – et les nombreuses et vertueuses tentatives de réactivation "par le bas" attestent des formes de résilience de ces lieux et communautés ainsi que la "scandaleuse force révolutionnaire du passé" [Albrecht, 2017] en offrant toujours des modèles crédibles de vie communautaire et en rétablissant des liens de co-évolution entre la communauté, le territoire et le patrimoine urbain. Loin d'avoir des connotations nostalgiques ou tardives, la question de la conservation de ce patrimoine nous interpelle de près et représente, pour ceux qui vivent dans des contextes éprouvés par la crise, un choix de responsabilité nécessaire, ainsi que la seule possibilité de protéger le territoire et d'investir dans un capital social et culturel non délocalisable.

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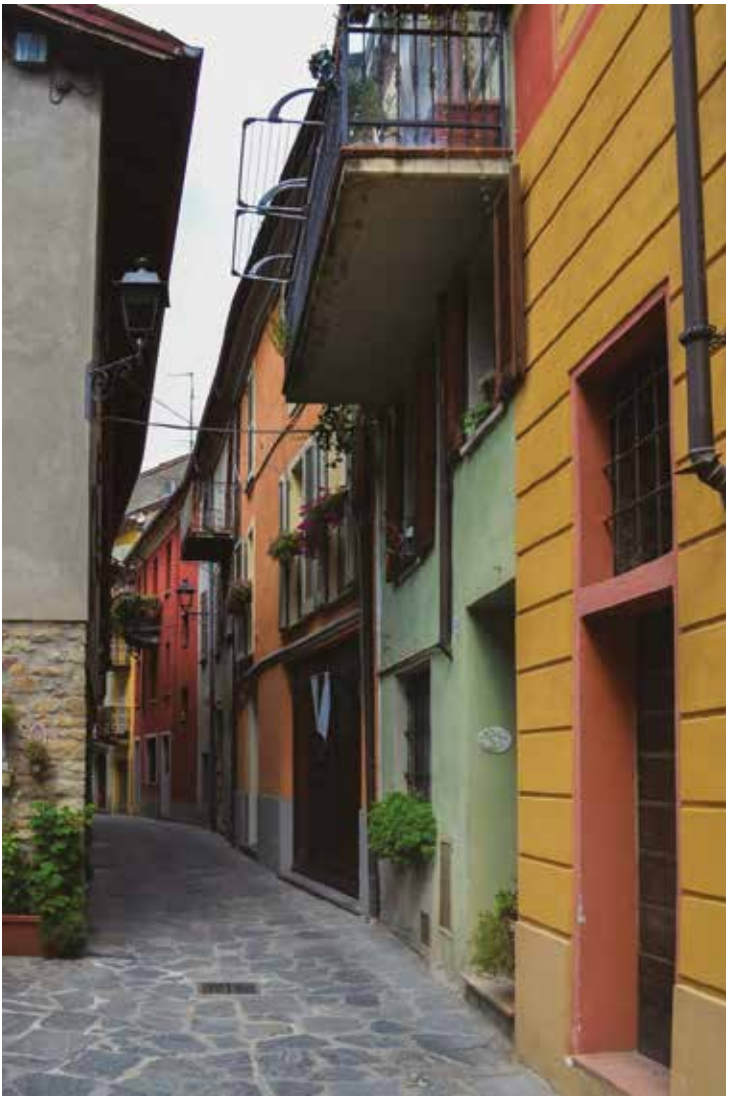

RETURN TO THE INNER AREAS IN THE POST COVID: REHABILITATE THE WIDESPREAD BUILDING BETWEEN CHALLENGES AND POTENTIAL CONFLICTS

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Colours of the facades in Varzi, Pavia, 2019.

In the past months, the health emergency caused by Covid 19 has highlighted the criticalities of living in large urban centres and the debate on the possible return to the marginal areas of our country has been reopened. After briefly commenting on the consolidated problems in the so-called Italian "inner areas" (especially the reduced offer of services, lack of job opportunities and generalized administrative problems), the paper intends to present some results of the doctoral research started before the pandemia. Based on the studies carried out in forty-two Lombard municipalities, divided into three case studies, the contribution intends to propose some observations on the current state of conservation and transformation of the widespread built heritage, as well as the planning tools that rule the interventions. Surveys and archival consultations, in fact, have shown how traditional building has often been distorted due to interventions not attentive to traditional materials and construction techniques or operations of total replacement. The study of urban planning tools, on the other hand, revealed the lack of an exhaustive cognitive framework of the built heritage and the reduced awareness of the widespread heritage as a repository of past stratifications and testimony of the history of those who preceded us, but also how often total renovation interventions are still permitted. Starting from these considerations, the paper offers some reflections on the risks for the historical built heritage, underlining how the conservation project must become central in the resettlement processes that involve inland areas.

Keywords: Inner Areas, widespread built heritage; inhabit marginal areas

Health emergency and return to "Inner Areas": remarks on consolidated criticalities

One of the largest health emergencies since the second post-war period struck the Earth in 2020: the contagion from Covid-19 highlighted the limits of living in large urban agglomerations: high population density[1], small houses size[2] (where we had to concentrate the space of everyday life: living, working and free time[3]), lack of private open spaces, difficult social

[1] For an analysis of the changes in the ways of living the domestic space during the so-called "lockdown" see Molinari L., *Ripensare l'abitare*, 27th April 2020 (www.doppiozero.com/materiali/ripensare-labitare).
[2] See the interview to Massimiliano Fuksas, *Serve un nuovo Umanesimo. Torniamo nei paesini e lavoriamo da casa*, 31th May 2020 (https://www.huffingtonpost.it/entry/fuksas-serve-un-nuovo-umanesimo-torniamo-nei-paesini-e-lavoriamo-da-casa_it_5ed354e5c5b6921167eea2c6?fbclid=IwAR0Tnk7koVdTLERe3cOOscdk-5_adrdq5IawFlq0q-qTPDbnejC7Q4mzfSfU).
[3] See the study of Maurizio Napolitano, researcher at Bruno Kessler Foundation (Trent): based on the American project of the civic hacker Meli Hervey, which mapped the size of the sidewalk of New York, the Italian analysis was made for South Tyrol, Piedmont, Emilia-Romagna, Abruzzi, Latium, Basilicata and Apulia (http://sidewalkwidths.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

distancing and pollution as a possible major vehicle for the epidemic. The areas with the highest residential concentration proved to be more exposed to infections, while the living conditions forced a reflection on the urban model.

During the most severe phase of the so-called "lockdown", the debate about the possible return to inner areas was reopened as a response to the problems of the city: starting with some important contributions, researchers and academics debated on challenges and opportunities of re-inhabit the marginal areas.

Stefano Boeri and Massimilano Fuksas proposed a return to the villages in the "phase 2" of confinement. Boeri suggested leaving the high population density to return to experience the historic villages, now often abandoned[4]: metropolitan areas should become aware promoters of a rural migration process. According to Fuksas the concept of living should be rethought by repopulating small villages, which have shown a stronger sense of community[5].

The response of the Italian debate was unanimous: the discussion on the return to the villages cannot be resolved in some slogans, but requires a reflection on the conditions of contemporary living and the limits of the economic development we had built: the possibility of re-inhabiting the inner areas cannot mean a new building dispersion, with the destruction of entire landscapes, as happened in the 70s and 80s[6]. The inequalities between metropolitan areas and internal areas do not only concern the historical divide between the north and south of the country, but are more widespread: Giuseppe Provenzano (Minister for the South and Territorial Cohesion) recalled in numerous interviews how "the processes of marginalization that the places have had, are not the result of chance, but of political choices made[7] or missed"[8]: inner areas have gradually disappeared from the political agenda and only compensatory measures have been taken. Currently there are no active policies on these issues and there are no territorialists in the team called to restart the Italian economy in the post-pandemic[9]. The urban themes

it/#15/46.4953/11.3439).

[4] See *Coronavirus, Boeri: "Via dalle città, nei vecchi borghi c'è il nostro futuro"*, 20th April 2020 (https://rep.repubblica.it/pwa/intervista/2020/04/20/news/coronavirus_boeri_via_dalle_citta_nei_vecchi_borghi_c_e_il_nostro_futuro2-254557453/).

[5] See the interview to Massimiliano Fuksas, *op cit*.

[6] About these theme, see: Lanzani A., Zanfi F., *L'avvento dell'urbanizzazione diffusa: crescita accelerata e nuove fragilità*, and Curci F., e Zanfi F., *Il costruito tra abbandoni e riusi*, both in De Rossi (edited by), 2018, *Riabitare l'Italia. Le aree interne tra abbandoni e riconquiste*, Donzelli, Rome.

[7] For a first overview about the policies in the second World War for South regions of Italy, for mountains territories and more in general for disadvantaged areas, see Silva B., *Italian policies on marginal territories: an overview*, in Pileri P., Moscarelli R. (edited by), 2020, *Cycling & Walking for Regional Development*, Springer, Berlin.

8 See the debate coordinated by Stefano Boeri and Paolo Piacentini: "Riabitare i piccoli centri. Una strategia per la dispersione post pandemica", (www.facebook.com/stefanoboeri/videos/3074987569235401/).

9 For further details on the team, see http://www.governo.it/it/articolo/

must be complementary to those of small municipalities, rejecting a welfare attitude and finding a solution to the problems that caused the abandonment.

What are the reasons for the marginalization of some areas? First of all, small and medium-sized cities have often lost their function and their urban character in favor of "metropolitan" realities. The academic community agrees that it is necessary to restore full citizenship rights to these territories, rethinking the services offer. The health emergency highlighted the inadequacy of the health system based on large hospitals, while the economical cuts of the last decade deprived the inner areas of local hospitals. Secondly, there is a lack of an efficient public transport system (train or bus) and the road system is often inadequate or not maintained, extending travel times. The theme of education its links with the territory need to be rethink due to the small number of children: Fabio Renzi underlined how schools represent one of the necessary principals to be able to revive marginal areas and how specific policies are needed today to support families who reside or intend to resettle in these territories[10]. The theme of education is inevitably closely connected with the issues of digitization and work opportunities. In the debate on intangible infrastructures, the structural limitations to access to television, telephone and broadband services for high-speed internet have been repeatedly denounced[11]: according to Sabrina Lucatelli, one of the first promoters with Fabrizio Barca of the National Strategy for the Inner Areas, broadband must become a fundamental right for all citizens, like water services and gas distribution. In relation to the theme of work chances, it is necessary to reflect on the creation of new opportunities. The marginal areas cannot be inhabited only by smart workers: also Minister Provenzano[12] highlighted how it is necessary to renew the economies, improving local economic, artisanal and productive activities. A return to agriculture and slope care activities should be encouraged as a reason for responsibility for the management of climate change and to prevent the reduction of biodiversity. Another employment opportunity is given by tourism. In this case should be more prudent than in the past: the effects of stopping international tourist flows due to the health emergency have clearly revealed the limits of economic development based only on tourism. The lack of widespread local and neighbourhood activities are other critical issues: during the emergency these activities have proved to be an essential service for the supply of communities.

task-force-la-fase-2-il-comitato-di-esperti-materia-economica-e-sociale/14453.

[10] In "Riabitare i piccoli centri. Una strategia per la dispersione post pandemica", *ibidem*.

[11] In a analysis published in April 2020, Istat underlines how many families have had to deal with distance learning and smart working with inadequate computer equipment ("Spazio in casa e disponibilità di computer per bambini e ragazzi", https://www.istat.it/it/files/2020/04/Spazi-casa-disponibilita-computer-ragazzi.pdf).

[12] In "Riabitare i piccoli centri. Una strategia per la dispersione post pandemica", ibidem.

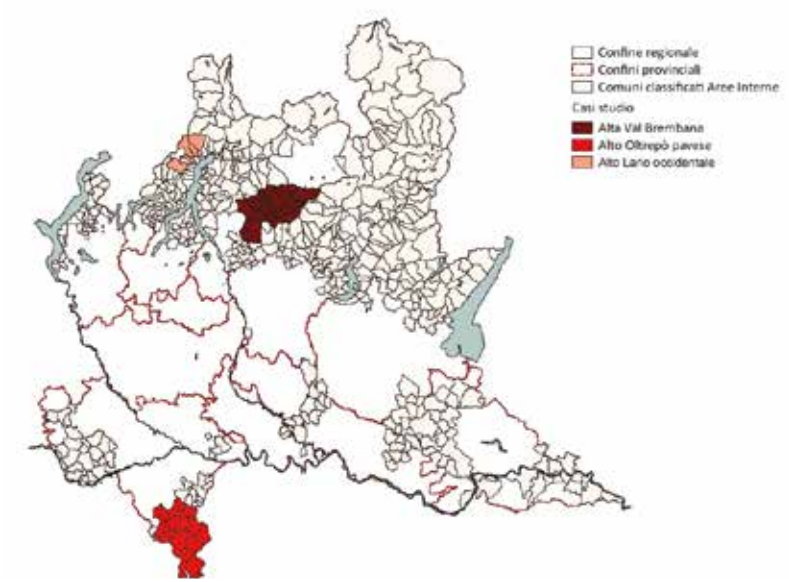

Fig. 1
The case studies: Alto Oltrepò Pavese, Alta Val Brembana and Alto lago di Como.

Fig. 2
New rooms in Valtorta, Bergamo, 2018.

Given the framework of consolidated criticalities, post Covid-19 cannot be a linear process in continuity with the past: the changes will force a careful construction of scenarios that put marginal territories, its inhabited areas and the transformations of the existing building.

Conditions of historic buildings in the inner areas of Lombardy: three case studies

The doctoral research carried out between 2016 and 2019 has shown that the attempts to return to marginal areas in Lombardy in the last forty years have had significant repercussions for the conservation of widespread construction.

After a on-desk research which concerned all the Lombard municipalities classified as "inner areas", three case studies were identified to investigate the observations that emerged on the state of use of built whispered heritage. Forty-two municipalities have been identified in the mountain area: fifteen in Alto Oltrepò Pavese, twenty-two in Alta Val Brembana and five in Alto lago di Como (Fig. 1).

The case studies were explored through surveys and archival investigations. The aims were multiple: to understand the urban development of the inhabited areas, the transformations of the widespread fabric of historically permanently inhabited settlements and the more frequently authorized interventions after the promulgation of Law no.

457/1978; to assess the current state of conservation and to analyse the regulations framework for the protection of ancient settlements.

The surveys showed different states of conservation and transformation. Despite the socio-geographic differences, the visits highlighted some similarities in the case studies of Alto Oltrepò Pavese and Alta Val Brembana. In both areas, the residential buildings of the ancient settlements have undergone numerous interventions that have heavily transformed the traditional building, although the layout of the inhabited areas and traces of the ancient past are still recognizable somewhere, while the abandoned buildings are mainly concentrated on rural structures.

The transformations involved all the architectural elements, even with total replacements and the use of non-traditional materials. The pavements of the public open spaces have been replaced. New rooms have been created in adherence to existing buildings (Fig. 2) and external stairs and wooden balconies have been replaced (also with the use of reinforced concrete- Fig. 3). Roofs have been rearranged or changed: the replacements concerned both the structural part and the mantle, made of bent tiles, concrete tiles or slate slabs. Plasters have often been changed or have been subject of partial (Fig. 4) or total scrape interventions (Fig. 5), while the joints have been styled with a mortar of different granulometry (Fig. 6); the colours of the facades have often been changed, in some cases with dyes that are unrelated to the context (Fig. 7). Windows have often been transformed in shape and size; window fixtures have been replaced in most cases, as well as the shutter.

Fig. 3
Replaced of external stairs in Zavattarello, Pavia, 2019.

Fig. 4
Partial scrape of the plaster in Mezzoldo, Bergamo, 2017.

In the case study of Como, on the other hand, there are numerous examples of local rural stone architecture, no longer in use today (Fig. 8 - Fig. 9). Although some previous interventions are recognizable (dating back to the immediate post-war period due to the construction techniques used), many buildings have not undergone significant alterations in recent decades: the total replacements are few example, but the interventions carried out are still invasive for traditional buildings (Fig. 10).
Simultaneously to the *in situ* investigations, which concentrated the analysis on the external fronts of the buildings and on the arrangement of open spaces, the archival investigation, conducted in three municipal archives, confirmed the most frequently authorized interventions were total renovation.

The hard preservation of the historical whispered heritage among changed needs of use, building renovation interventions and planning tools

The results of the fieldwork have opened some questions regarding the theme of use (intended above all as "under-use" or "partial use"), of the ways and limits detected in the reuse of historical buildings and the relationship between the numerous transformations of buildings and conservation of historical settlements.

The conditions of the traditional heritage, today profoundly transformed in the ways of use and restructuring interventions, confirm the doubts advanced during the long debate that accompanied the "question of historic centres" from the 1960s to the "piani di recupero" (recovery plans) and the categories pursuant to law no. 457/1978. Although the promulgation of the Gubbio Charter (1960) formalized the national importance of ancient settlements, prescribing their study and census and indicated the need to subject historic centres to specific rules within urban planning, the results of the research showed how the tools for the management of the urbanized territory have not been able to take up the challenge of safeguarding historic settlements and conserving traditional buildings. Even in the territories considered as inner areas in Lombardy, the attempt to link the themes of the protection of historical buildings and those of the transformation of the widespread heritage must be considered largely unsuccessful: the substitutions and changes show that the hoped-for synergy between the demands of changed needs and those of conservation has not been achieved, and how the former have often clearly prevailed over the latter. As noted by the authorized building practices, most of the interventions concerned building renovation projects that have not been able to protect traditional architecture, while the authorizations requested for restoration and conservative rehabilitation works attest invasive interventions for the existing buildings.

Fig. 5
Total scrape of the plaster in Bagnaria, Pavia, 2019.

Fig. 6
Granulometry of the mortar of an intervention in Foppa, Isola di Fondra, Bergamo, 2019.

The not conservative approach to historical buildings and very permissive interventions are validated also in the current provisions of the urban plans. The analysis of urban planning tools has shown that the documentation drawn up for the widespread heritage (included in the ancient settlements) has gaps and defects. The first shortcomings concern the construction of the cognitive framework: the identification of the ancient residential area (and consequently of the buildings that fall within this perimeter) and the necessary detailed investigations to the historical building. The studies drawn up appear often partial and the knowledge framework fails to trace a clear and exhaustive restatement of the state of affairs. The reduced in-depth study of widespread buildings and the limited knowledge of traditional construction have repercussions also on the proposed plans: the possibility of renovating or invasive operations on the built heritage is still prescribed for most buildings. Furthermore, the provisions make possible to replace, remove the non-"original" elements or demolish the parts identified as "superfetation" or built after the "original" phase, due to the lack of recognition of the stratification of the interventions carried out on the buildings. The concepts of "original", "replacement" and "superfetation" are widely used in the indications for interventions, but the criteria for defining what plans intend to remove and what deserves to be preserved is never defined in a clear and exhaustive manner. The remarks to the plan regulations confirm the denial

of the recognition of traditional buildings as depository of signs that the use of these buildings has handed down to us, as appeared with the surveys.

Re-inhabiting marginal territories: potential challenges and conflicts for widespread heritage

The issue of the possible return to inhabit the "inner areas" and its villages could persist as a central topic in the national panorama, due to the health emergency and the events caused by climate change. Debating about the possibility of a return to marginal areas requires necessarily a rethinking of the building heritage present in these places. As Antonio De Rossi and Laura Mascino noted in a recent contribution, in the inner areas "there is very little to build from scratch. If anything, there is a huge territorial fixed capital, an incredible device for living, which is waiting to be reinterpreted, reused, maintained, renewed[13]". According to some surveys conducted by Legambiente[14], half of the assets built in these territories are

[13] See De Rossi A., Masciano L., [*Riflessioni] sull'importanza di spazio e territorio nel progetto delle aree interne. La territorializzazione delle politiche oggi rappresenta una priorità incontrovertibile: da qui la necessità di ribadire alcuni nodi per il post crisi*, 1st May 2020, in AgCult (https://agcult.it/a/17940/2020-05-01/riflessioni-sull-importanza-di-spazio-e-territorio-nel-progetto-delle-aree-interne?fbclid=IwAR12XQUhrQ8ASlFnXOyWKswraJRu_dCWwE-ajOHKiYm1BSxG_gPO0f2uJGQs).

[14] See the contribution of Alessandra Bonfanti in the debate "Riabitare i piccoli centri. Una strategia per la dispersione

Fig. 8
Rural stone architecture in Livo, Como, 2018.

Fig. 9
Rural stone architecture in Peglio, Como, 2018.

unoccupied: if even a quarter of them were able to be regenerated, three hundred thousand new inhabitants could be brought in, with a turnover of two billion euros and thirty thousand new employees[15].

Although the evolution of the debate on the conservation of ancient centres has consolidated the safeguarding of the entire historic centre, extending the concept of cultural heritage from the single monument to the "urban and landscape environment", the results of the research show how the operations carried out were guided especially by the adaptation of traditional structures to urban quality standards. The actions are not often addressed to the object being transformed, but are guided by reasons of cost-effectiveness of the intervention, both in the materials and in the craftmen, and by "fashions" referring to a poor culture and a reduced knowledge of traditional construction. The indications for protection appear limited to individual buildings (especially monumental), while there is a lack of general recognition of the formal importance of historical settlements as a testimony of traditional culture and technique. The normative prescriptions for whispered building, theoretical and practical, are not always precise and pertinent and they are still limited to generic prescriptions. Proposing a return to these places means also rethinking

post pandemica", *op. cit.*
[15] See the contribution of Alessandra Bonfanti , *ibidem.*

the ways of living in traditional buildings and the intervention on the historic buildings that are not used today, questioning the conservation of the traces, in traditional materials and techniques, which have come down to us. The limits highlighted for urban planning tools often make it impossible to make conscious design choices and have repercussions on the poor safeguarding action.

The study about widespread buildings in Lombardy outlines a clear demarcation between the settlements that have lost the consistency of the local construction and the few inhabited areas that, on the other hand, have maintained their traditional characteristics. In the light of what has been verified in the field, it is essential to restore a function to the architectures where the constituent elements remain recognizable, subtracting them from phenomena of ruderisation. At the same time the buildings should be removed from the "reckless" and careless transformation: the construction systems, the traditional materials, their age and duration should be surveyed, recognized, placed at the centre of a communication and involvement strategy, in search of a "kind modification" that can allow its use to current and future generations. In the portions that have not yet undergone total replacements, the operations will have to mediate between the contemporary comfort models of living and the need to preserve and safeguard the historical and architectural characteristics that these buildings still keep.

Fig. 10
reinforced concrete balconies in Livo, Como, 2018.

In light of what has been studied, at least for the so-called "inland areas" of Lombardy, it appears essential to develop a shared awareness of the importance of the heritage of these localities, which is common to all stakeholders: administrators, technicians, designers and owners. Knowledge should represent the basis of planning and design: an organized, shared and participatory action between the public body and citizens, which can support intervention choices in these contexts. The ancient settlements should be preserved as a whole: a general protection project should be studied within which the individual interventions should be coherently inserted. In this sense, the conservation project should acquire a new centrality within the tools that accompany the resettlement processes, breaking with what has been done so far, seeking a better mediation between the instances of protection of whispered heritage and the requests for environmental comfort by the new residents. Ultimately, the project for the existing should be part of a territorial vision of the enhancement and conservation of this testimony.

*All the photos are by the author.

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The ruins of the Spanish town of Belchite.

Abstract
Throughout history many villages and cities have been abandoned following natural disasters (floods, landslides, earthquakes), war events (bombings) or due to changed economic, political, social situations. If in many cases they have been left to a progressive degradation due to neglect or disinterest, elsewhere the desire to crystallize the conditions, although precarious, of a certain historical moment, comes from very specific choices: from the small center of Conza della Campania in Irpinia, to the cities of Beichuan in China and Pripjat in Ukraine; from the French villages of Douaumont and Oradour-sur-Glane, to the Spanish Belchite; from the Japanese island of Hashima to the Chilean mining towns of the Atacama desert. The paper focuses on the analysis of some sites wounded by natural disasters or events, not reconstructed, but deliberately left to their state of ruin: places of memory, collective identity, warning and reflection which, paradoxically, thanks to their dilapidated state, have recovered, if not created for the first time, a high level of attractiveness.

Keywords: devastation, warning, Belchite, Conza della Campania, Beichuan.

Introduction

Throughout history many villages and cities have been abandoned following natural disasters (floods, landslides, earthquakes), war events (bombings) or due to changed economic, political or social situations. Then, almost always they were left to a progressive degradation for lack of interest or convenience while the inhabitants moved elsewhere. However, these villages, often located in inaccessible and isolated places, perhaps due to their state of decay and difficult accessibility, have often attracted the attention of visitors seduced by the charm of ruin, mystery or the forbidden. For example, Bussana Vecchia, a small Ligurian town hit by an earthquake in 1887, starting from the late '50s was even illegally occupied by some artists who subsequently created a stable resident community that contributed to the rebirth of the country (Giuffré, 2005; Mezzano, 2008, pp. 501-506). Even the Calabrian village Pentedattilo, made famous by Escher who portrays it in a series of drawings (Séstito, 2004, p. 18) and depopulated after various natural disasters, in the '80s it was rediscovered by a group of young people who contributed to make it a suggestive venue for events including an international film festival. Completely unusual is the story of Gibellina, a Sicilian city destroyed

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The Italian old village of Conza della Campania (AV) destroyed by the earthquake in 1980.

by the Belice earthquake in 1968. The local administrators, perceiving the potential of an 'alternative' revitalization of the area, had invited famous artists and architects (Burri, Schifano, Pomodoro, Paladino, Sciascia, Quaroni, etc.) to enhance with their works the new city, built about 10 km from the old one (Curioni, 2017, pp. 133-138). But the painter Alberto Burri, adopting a personal position, preferred instead to work in the ancient centre now abandoned (Zorzi, 1995). Here he compacted the rubble and covered it creating some huge masses of white concrete that reconstitute the consistency of the ancient blocks and streets, similar to deep wounds on the ground (Belisario, Tecce, 2012, p. 185). The artist realized the transposition on an urban scale of a 'cretto', a typical theme of his works of the seventies and he created a monument to death, but also a symbol of rebirth (Pirozzi, 2015). The work, which began in 1984 and ended only in 2015 due to lack of funds, demonstrates the social and cultural value of contemporary art as a collective and not just local identity stimulus. Today it is a very visited and well-known example of land art, even in the international scene.

For some years, the interest in these wounded and abandoned places has been growing more and more, also within the scientific and cultural world, as evidenced by the organization of various events, the copious publications and many thematic websites[1]. Furthermore, their use as location for photographic and film sets has definitively made it famous to the general public[2]. But if several of the 'ghost towns' have spontaneously transformed into tourist destinations, without awareness or planning, there are some particular cases in which the desire to crystallize the conditions, even precarious, of a certain historical moment derives from very specific choices, generally connected to cultural or political reasons. In fact, there are entire abandoned and ruined villages that have been structured as real open-air museums with organized routes, facilities and sometimes exhibition rooms. Thus, the new 'disaster tourists' walk inside a sort of a large urban scenography to be explored and observed in search of personal and always different perceptions. These places of collective memory, immersed in the landscape, include nature and architecture, full and empty, public and private spaces. The remains of the destroyed buildings unequivocally exemplify the impact of natural or man-made calamity. But most of all, it is the traces of an abruptly interrupted everyday life, which often resurface among the ruins, that connect the visitors emotionally with the intimacy of the old inhabitants. The concept of monument seems to broaden its typological, chronological and geographical boundaries and address itself to a more numerous and heterogeneous audience (Choay, 1993, pp. 7-11). An evident change in scale and content is generated, the cult and the memory of the event take place through new forms which, albeit full of celebratory, didactic and demonstrative intentions, are now devoid of rhetoric and symbolism and take on more ethical than cognitive relevance (Rinaldi, 2007).

Earthquakes and other calamities: the disaster tourism

Earthquakes have been (and are) one of the main causes of devastation and abandonment of inhabited centers. The one in Irpinia in 1980 caused the destruction of many ancient villages in the hinterland of Southern Italy. And the reconstruction, while involving experts from various fields (historians, urban planners, economists, sociologists, etc. ...), has not always managed to save the pre-existing structures, also causing the loss of environmental and social identity (Teodosio, 2013; Teodosio, 2018). Many so-called 'paesi presepe', urban aggregates made up of generally modest buildings but with considerable historical and social

[1] Among others, the website https://www.paesifantasma.it/index.html offers an interesting and accurate mapping of ghost towns in Italy and in the world, with synthetic sheets containing information on the causes of abandonment and the current state of the places.
[2] The U2 made the photo shoot for the album The Joshua Tree (1987) in Bodie, an abandoned Californian village; Craco in Basilicata was the location for some scenes of "The Passion of the Christ" by Mel Gibson, "James Bond: The Quantum of Solace" and "Saving Grace" by Tom Conti.

The historical-archaeological Park of Conza della Campania (AV).

value, have been abandoned and the inhabitants have moved to the 'new towns' (Costato, 2005, pp. 201-210).

Conza della Campania (Avellino) is a fairly unique case of its kind. The town was relocated because after the earthquake the idea prevailed that, for geological reasons, it was inappropriate and safe to rebuild *in situ*. But probably, this choice was encouraged by the fact that among the ruins of the destroyed village, the traces of the ancient *Compsa* emerged. And this seemed an unmissable opportunity for the economic and tourist recovery of the area. So, while the new Conza was built in the valley, the old one perched on a summit, after becoming public property, was transformed into an historical-archaeological park with a lot of suggestive stratifications.

The site, inaugurated in 2004 after some conservative restoration interventions, was fenced and equipped with services (parking, ticket office, small antiquarium). Internal routes overlapping the ancient Roman roads have been organized, and external ones too that intend to broaden the visitor's interest in the environment and the surrounding landscape (Carluccio, 2002). Among the ruins of the houses, inhabited until the evening of the earthquake, the remains of buildings and structures from the Roman and Medieval periods resurface: forum, amphitheater, thermal baths, domus, insulae, old cathedral. But, despite the potentiality, enthusiasm and dedication of singles passionate and local

associations, for bureaucratic and management reasons, this interesting project is struggling to take off and the ancient center, rather than a fly-wheel for the local economy, continues to represent a sort of a 'monument to the earthquake' in which the inhabitants are still looking for traces of their lost identity.

Similarly, sad is the story of Beichuan, a Chinese city hit in 2008 by a devastating earthquake that destroyed 80% of its buildings, killing about 8600 people, including 1000 children who were victims of the collapse of their school, which is now partially recovered and transformed into a museum.

Also in this case, the Government decided to rebuild the town elsewhere and not to clean out the affected area that was made safe and accessible and transformed in a huge memorial, a symbol of the devastation but also of the great determination of the Chinese people to get over the tragedy. The site also offers to the scientists from all over the world the precious and rare opportunity to observe with the naked eye the consequences of a severe earthquake on a contemporary city: piles of rubble, blown roofs, deformed structures with bent pillars and armor. The gutted buildings allow to glimpse the interior of homes where time seems to have stopped: paintings, bookcases, living rooms, objects of everyday life trigger an inevitable reflection on the immensity of collective tragedy and its impact on the private life of each individual inhabitant. The site, with over 3 million annual visitors, has become a destination for mass tourism, albeit still daily, passing and local. Visitors walk through this sort of large open-air museum, moving among the mutilated buildings and the very eloquent signs of a still recent disaster. However, Beichuan Earthquake Historic Site is first of all the place of commemoration of the victims, a large tomb for those dead whose names are engraved on a long wall of remembrance and whose bodies have, in many cases, been permanently buried under the rubble of the collapsed buildings.

But if these earthquake-related projects are struggling to start, the rise of tourism in the places of the Chernobyl tragedy is taking on quite another connotation, also encouraged by a recent television series that fueled the myth. Visitors from all over the world, also challenging all possible dangers due to the pollution of the site, take tours organized in detail, which include not only a visit to the remains of the reactor, now enclosed in a large metal dome, but also to the Ukrainian ghost town of Pripjat, sentenced to death by the explosion, and even a lunch in a traditional restaurant. If for the Kremlin the British-US television production represents only a frowned upon 'caricature of the reality', actually it has undeniably contributed to the tourist promotion of one of the probably least attractive areas on the planet. These experiences demonstrate an unsuspected and multiple value of the ruin on an urban scale. The purely celebratory objective, flanked by not always realized tourist ambitions, tries to open new

Beichuan Earthquake Historic Site (China).

economic perspectives for the affected territories, giving life to a 'tourism of disaster' which for many places represents an opportunity, despite sometimes it assumes voyeuristic connotations rather than a real emotional identification.

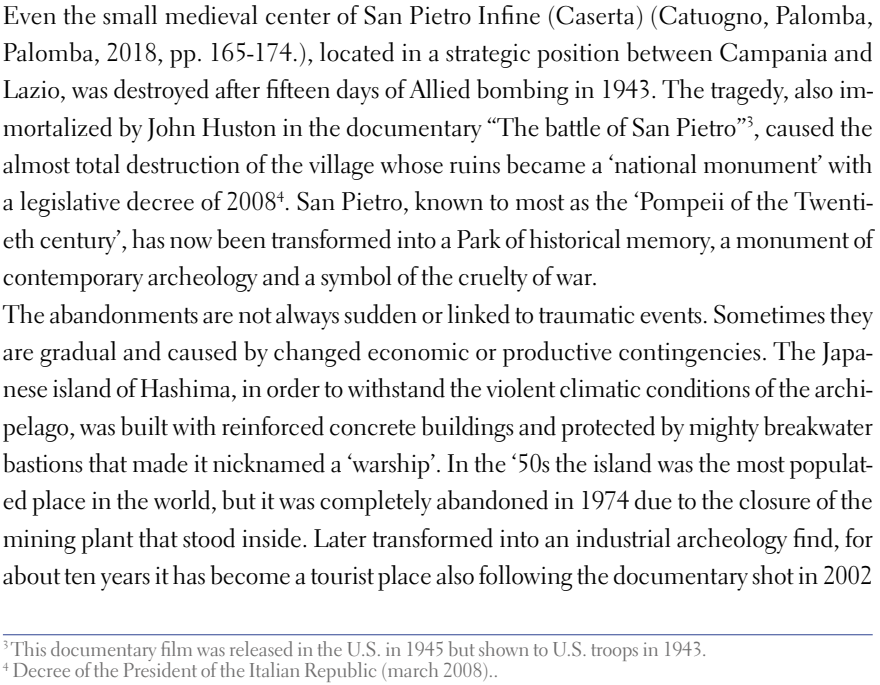
Scars of wars and economic declines

There are also numerous villages destroyed by wars, from that moment on abandoned and intentionally left in ruins with the aim of turning them into an open-air museum of memory. France proves to be an exemplary case, particularly in the Lorraine region where several battles of the Great War took place, leading to extermination and devastation in many towns located on the borders with Germany. Since then, some of these small settlements have been purposely crystallized at the time of their destruction. The traces *in situ* try to make up for the enormous difficulty of communicating the drama of those events, which no object collected in a more traditional museum would be able to convey. It is therefore not a question of a sacralization of the past, but the simple safeguarding of those scars that tell us the history and give meaning to memory. Often the few project designs are limited to symbolically represent some places or monuments that are unrecognizable today. In Douaumont (Sherman, 1999), for example, mineral strips recall the walkways and the so-called '*usoirs*' (areas situated in front of the terraced houses), while stone monoliths remind the fountain located on the main road as well as the municipal building.

Similar situations were clearly created also following the massacres perpetrated by the Nazis, such as in Oradour-sur-Glane (New Aquitaine) where the town, plundered and set on fire by the Germans, was rebuilt further north in the '60s, leaving the old center as it was in eternal memory of those bloody events (Farmer, 1999).

But one of the most famous and most visited ghost towns in Europe is certainly the Spanish village of Belchite, in the province of Zaragoza. Destroyed during the civil war in 1937, it had strenuously defended the Francoist government, sacrificing itself to curb the northward advance of the republican troops. The bloody battle, also recounted by the great Ernest Hemingway who witnessed it, had led to a profound destruction of the village. While the ruins were left unchanged to undergo the signs of time, and although some inhabitants had decided not to abandon them, the new city, at the behest of Franco himself, was rebuilt a few kilometers away from the prisoners of the concentration camps. Thus, the dictator intended to eternally remind the world of the memory of those terrible events, transforming Belchite into the symbol of his triumph and his alleged greatness. For nearly 80 years these two parallel realities have been living side by side and, recently, the old village has established itself as a tourist destination.

The Ukrainian ghost town of Pripjat.



The War Memorial of Douaumont in France.

Even the small medieval center of San Pietro Infine (Caserta) (Catuogno, Palomba, Palomba, 2018, pp. 165-174.), located in a strategic position between Campania and Lazio, was destroyed after fifteen days of Allied bombing in 1943. The tragedy, also immortalized by John Huston in the documentary "The battle of San Pietro"[3], caused the almost total destruction of the village whose ruins became a 'national monument' with a legislative decree of 2008[4]. San Pietro, known to most as the 'Pompeii of the Twentieth century', has now been transformed into a Park of historical memory, a monument of contemporary archeology and a symbol of the cruelty of war.

The abandonments are not always sudden or linked to traumatic events. Sometimes they are gradual and caused by changed economic or productive contingencies. The Japanese island of Hashima, in order to withstand the violent climatic conditions of the archipelago, was built with reinforced concrete buildings and protected by mighty breakwater bastions that made it nicknamed a 'warship'. In the '50s the island was the most populated place in the world, but it was completely abandoned in 1974 due to the closure of the mining plant that stood inside. Later transformed into an industrial archeology find, for about ten years it has become a tourist place also following the documentary shot in 2002

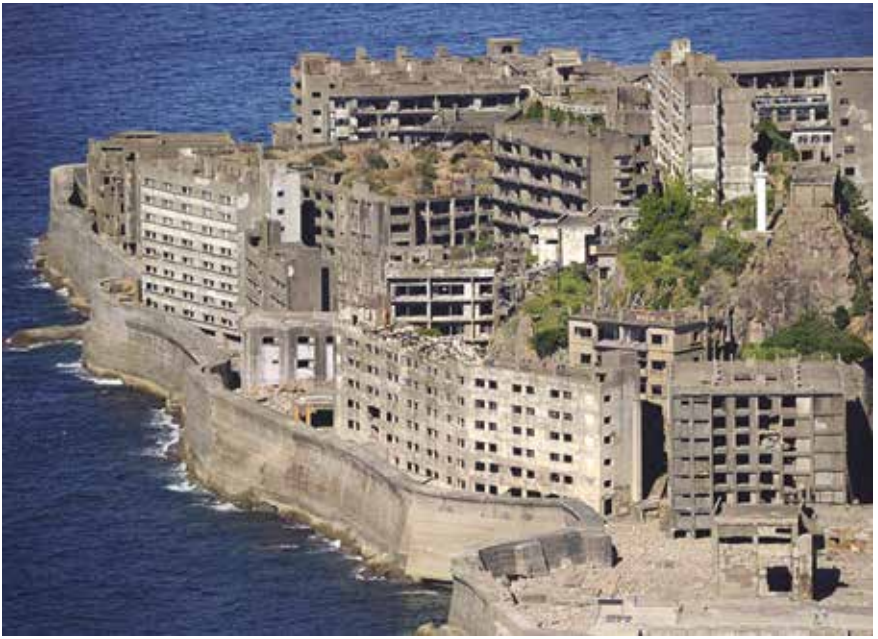
[3] This documentary film was released in the U.S. in 1945 but shown to U.S. troops in 1943.
[4] Decree of the President of the Italian Republic (march 2008)..

by the Swedish director Thomas Nordanstad and the subsequent film Skyfall (About the media success of this site, see: Synenko, 2018, pp. 141-153). In Chile too, many mining villages in the Atacama Desert were slowly abandoned after the shutdown of the largest silver smelter in South America in 1902. Today they constitute an articulated memory park in the Antofagasta Desert, which includes open-air paths and a Museum of mining civilization that attracts many visitors lured by the ruins of the old factory, declared national heritage in 1974 (Berizzi, Rocchelli, 2019).

Conclusions

The charm of the ruins is not a recent habit, but the strong tourist attraction of areas sometimes severely battered by war events or natural disasters, could leave us a little confounded. The emotional impact of the remains and in some cases of the symbolic elements designed to recall specific events, seems to be the common thread of the crystallization of several abandoned villages. But this practice of 'non-intervention' usually arises with much deeper and more social ambitions than simple travel promotion and aims to touch the collective consciousness and encourage a series of reflections on contemporary history to prevent the recurrence of certain dramas. Memory, wrote the French scholar Pierre Nora, editor of the famous publication *Les lieux de mémoire* (1984), "is full of feelings and magic, ... it feeds on nuanced memories", placing "memory in the context of the sacred" while " history draws out it and makes it prosaic" (Nora, 1984). The villages devastated by earthquakes or by war

The Park of historical memory in the little Italian village of San Pietro Infine (CE).



The Japanese island of Hashima.

as well as the villages slowly abandoned as a result of changed productive activities all have a past full of educational messages capable of awakening the civic spirit of the new generations, thus saving from oblivion not simply the places but situations. The open-air museums, often strongly desired by the communities to become a warning and invitation to reflection, sometimes promoted by a dictator to magnify his success and power, in other cases encouraged by media rediscovery, are all equally united by a new concept of memory that is no longer based on simple memento, on the story or on merely symbolic evocation, but which is based on very concrete testimonies such as ruins (Choay, 1995). The explanatory component now predominates over the simply commemorative one: the ruined stones of ancient villages, but also the rubble of modern cities composed of heavy concrete buildings, convey messages and emotions in the same way. The phrase of the Spanish philosopher and writer George Santayana, engraved in thirty languages on the monument in the Dachau concentration camp, is also relevant for abandoned villages: " Those who cannot remember the past are condemned to repeat it".

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Mon. Virginio
Mantiana
S. Pupa
Monterano
MONTERANO

THE VILLAGE OF MONTERANO: IDENTITY FEATURES, AND RESTORATION

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G. B. Cingolani, Topografia geometrica dell'Agro Romano, 1692, in P. A. Frutaz, Le carte del Lazio, Roma 1972, vol. II, XXXII.1d; detail.

The contribution aims at examining the significant case of the ancient village of Monterano, located in the neighbourhood of Rome, in Canale Monterano municipality, perched on the plateau of a tufaceous hill, west of Bracciano Lake, uninhabited. The initial layout of Monterano is attributable to the Etruscan era; between the Sixth and Seventh centuries, it acquired a relevance that ensured prosperity until the end of the Eighteenth century when, due to political events, it was abandoned: the population settled in the plain below, giving life to the urban centre called Canale Monterano. Its morphological characteristics and the state of abandonment were generating a sense of detachment of the population from the ancient village, until recently. A new awareness raised in the Seventies and Eighties of the Twentieth century, by studies and researches came to the recognition of the historical-architectural and naturalistic heritage, so that they were finally perceived as identity values by the community. At the same time, Monterano Regional Natural Reserve was established, to protect over a thousand hectares of the Canale Monterano area, including the ancient village. Moreover, starting from the early Nineties, significant reinforcement and restoration projects of the ruined structures have been carried out. In this frame, recent actions on today's system have been undertaken, trying to escape the dualism of Monterano-Canale Monterano couple. Regarding this, the institutional initiatives contributed the projects drafting of the paths to reach and visit the naturalistic glimpses and ancient remains; the task involved researches and experimental works conducted by the Sapienza University of Rome and by the University of Tuscia, by the Regional Natural Reserve, the Municipality of Canale Monterano, as well as by local associations and citizenship. The synergy pursued, looking at the confluence of the various disciplines, is contributing to define the action on heritage, considering that conservation and innovation are the founding terms of the safeguard-development issue. In this regard, Restoration discipline can indicate values, report risks, and direct the project approach based on the recognized degree of transformability.

Keywords: heritage, restoration, safeguard, development

Memories and perceptions

The contribution aims at examining the significant case of the ancient Monterano at present time uninhabited, located in the neighbourhood of Rome. Its initial layout is attributable to the Etruscan period; living through Roman and medieval Era, during the VI and VII centuries it acquired a relevance that ensured prosperity to people. At the end of the XVIII century, due to political events, it was abandoned, and the population settled in the plain below, giving life to the urban centre named Canale. Contemporary, the state of ruins contributes to some particular significances inside and with surrounding. (Fig. 1)

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Fig. 1
The ancient settlement in a view looking from east to west; main architectures emerge from the tuffaceous hill, surrounded by greenery. Ph. by A. P. Bambolo, published in F. Cesarano, B. Tetti, 2018, cit.

Within the Tolfetano-Sabatina region, west of Bracciano Lake, Monterano stands perched on a plateau of a tuffaceous hill, close to the Mignone torrent: in this area small settlements, around the springs and along the waterways, were already in existence in prehistoric times. Around the VIII century b. C. the territory was occupied by *Caere*, becoming part of the *Lucumonia Ceretana*; during the Etruscan era, structured villages were built located on upland plains, usually at the confluence of two waterways: so was Monterano, called *Manthura*. Being the Etruria region conquered by Romans, the routes network radically changed, referring to the Capital centrality, so Monterano remained along a secondary path and lapsed into a small suburban village. The territory was crossed by consular roads, some of them still existing: Aurelia, Cassia, Clodia, Flaminia, and Cornelia passing the countryside, connecting Rome to Tarquinia, entering Monterano neighbouring by Ponte del Diavolo.

During the Middle Ages, it returned to its former role as a military stronghold and refuge, flourishing until the Modern age, once more along a favourable itinerary: «*Riding through steep slopes, passing the Mignone, crossing those mountains with clear and very fresh waters, we entered the vague and delightful town of Monterano, famous for its excellent wines, verdant for its thick and very densegrains*»[1].

Monterano was scarcely documented until the XVI century when some changes of ownership wereregistered involving noble Roman families -such as Anguillara, Colonna, Mellini, Della Rovere, Cybo and Orsini-. Starting from late XVII century it was administrated by the Altieri family, to whom the last significant city guise, witnessed by ruins still existing, is to be attributable, including the Baronial Palace and S. Bonaventura

[1] Chronicle describing the journey made by Pope Clement VIII Aldobrandini «…cavalcando per chine scoscese, passato il Mignone, che con chiare e freschissime acque attraversa quelle montagne, entrammo nel vago e dilettevole paese di Monterano, famoso per gli ottimi vini, verdeggiante per gli spessi e foltissimi grani», J. A. F. Orbaan, Documenti sul barocco in Roma, Roma 1920.

complex, located west, out of the walls. The palace was built enlarging the fortified structures situated on the highest point of the tuff spur; around it, modest houses and the churches of S. Maria Assunta and S. Rocco were located. Altieri palace became a pivotal in the reformed layout: the ancient fortress area came to be the city centre, through a new arrangement of a square, Piazza Longa, characterized by the cliff fountain, and the secret garden.

The village was protected by walls -formed by the "bastioned houses"- and gates, illustrated in the plate by Giovanni Battista Cingolani dated 1692; outside the walls S. Bonaventura convent, the mill and the granaries stood [2]. The view by Giuseppe Barbieri describes the town at the time of its abandonment, occurred between the end of the XVIII and the beginning of the XIX century[3]. The Papal Land Registry compiled in 1818, records it as an Altieri family undivided property, named «*Monterano dirocato*» [ruined], informing that it was mostly inhabited and decayed.[4] (Figg. 2-4)

The abandonment occurred during the Roman Republic period, due to the political events of the years 1798-1799: people leaving settled down in Canale and Montevirginio, for whose improvement Monterano provided construction material. The uneasy morphological characteristics and the state of decadence were generating a sense of detachment from the village, until recently: still during the early XX century, inhabitants of the region were naming it *Monteranaccio* [bad Monterano] because of its inhospitable appearance, war event memories, and epidemics: the epithet shows as it was felt separated by historical positive reminiscence. [5]

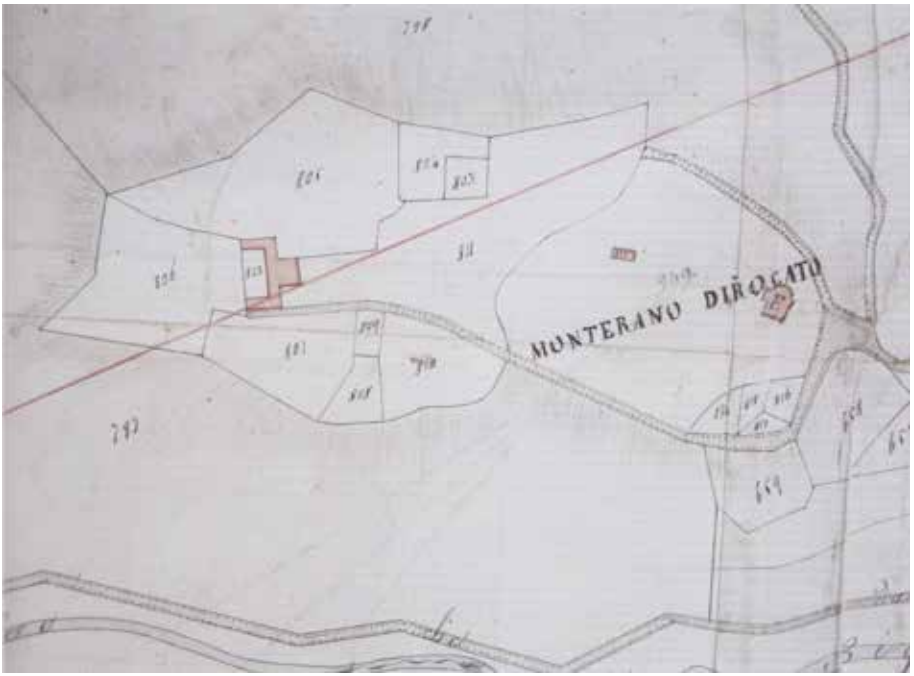
[2] G. B. Cingolani, Topografia geometrica dell'Agro Romano, 1692
[3] G. Barbieri, veduta di Monterano in Palazzo Altieri di Oriolo, 1782.
[4] Archivio di Stato di Roma, Catasto Gregoriano, 1818, Civitavecchia, mappa 24.
[5] On the history of Monterano and its region L. Barelli, Monterano «città diruta», in Riserva Naturale Monterano: lavori di restauro e consolidamento, a cura di F. De Cesaris, A. Di Muzio, M. Morbidelli, Vetralla (VT) 2016, pp.13-24; F. Stefani, Monterano, Appunti sul territorio e la storia, in "I Quaderni di Monterano", 1., Canale Monterano 2014; F: Stefani, La storia del rinnovamento urbanistico di Monterano nel Seicento, "I Quaderni di Monterano", n.2 Canale Monterano 2015; F. Stefani, Le strade antiche nel territorio di Canale Monterano, in Il Borgo di Monterano, Caratteri identitari e prospettive di valorizzazione, a cura di B. Tetti, F. Cesarano, Vetralla (VT), 2018, pp. 21-28; L. Gasperini, Monterano: un centro minore dell'Etruria meridionale, Louvain 1963; H. Hager, Bernini, Mattia de

Fig. 3
G. Barbieri, view of Monterano in Palazzo Altieri di Oriolo, 1782. Published in L. Barelli 2016, cit., Fig 14, p.18.

Fig. 4
Archivio di Stato di Roma, Catasto Gregoriano, 1818, Civitavecchia, mappa 24, detail. Published in L. Barelli 2016, cit., Fig 15, p.19.

A new awareness raised during the second half of the XX century, looking at the identification of the historical-architectural and naturalistic heritage, so that the still existing testimonies of the past begun finally to be perceived as a common identity by the community. Studies and exploration of Monterano were revitalized: the area hosted cinematographic settings, archaeological researches, historical and artistic studies contributing to the recognition of historical and environmental features, calling the attention to the close bond between history and nature. As a consequence, starting from the early Nineties, significant reinforcement and restoration works were carried out, including those on S. Bonaventura and S. Rocco churches, Palazzo Altieri, and city walls and gates. Moreover, in 1988 a Monterano Regional Natural Reserve was established to protect

Rossi and the church of S. Bonaventura at Monterano, in "Architectural history", 21.1978, 68-78; M. Benucci, G. Romagnoli, La chiesa di San Bonaventura a Monterano: documenti, immagini, strutture materiali, Vetralla (VT), 2009; L.Gasperini, Il Braccianese nell'antichità dalla preistoria al medioevo, in "Tuscia Archeologica" 2, 5-6.1971, 4-11; A. Pinelli, Bernini a Monterano, in Il Seicento/documenti e interpretazioni, in "Ricerche di Storia dell'arte", 1-2.1976, 172-188; L. Di Salvo, La chiesa e il convento di S. Bonaventura a Monterano, Bracciano 1980 (Quaderni della Forum Clodii, 7); E. Debenedetti, Giuseppe Barbieri, un diario visivo idealmente dedicato alla famiglia Altieri, in '700 Disegnatore: incisioni, progetti, caricature, a cura di Elsa Debenedetti, Roma 1997 (Studi sul Settecento Romano, 13), pp. 183-227; F. Stefani, Monterano: appunti sul territorio e la storia, Canale Monterano 1998; L. Gasperini, Archeologia e storia del territorio canalese, Canale Monterano 1999; M. Piccioni, Nella venuta che fecero li francesi. Il feudo Altieri e il Patrimonio tra insurgenti francesci e giacubbini loro partipanti 1789-99, Canale Monterano 2003 (Quaderni della Riserva naturale regionale Monterano, 5).



over a thousand hectares of the most representative and intact habitat of the Tuscia Romana region, rich in biodiversity, also including the ancient village; enlarged in 1993, the Reserve today protects over 1,000 hectares of land, most of which collectively owned and managed by Canale Monterano Agricultural University. [6]

Former and present identity: values to conserve, features to enhance

Monterano today constitutes a *unicum*, actualizing matters concerning landscape, environment, building ruins, architectural remnants, cusp border areas, paths; not an immutable but a dynamic spot, enclosing construction and re-construction periods succeeded one another: it expresses the synthesis of a continuous modification process, still in progress.
Achieved a consciousness regarding the whole of qualities embodied by Monterano, closely bonded between ruins and wild, a new question raised, regarding how to manage such

[6] F. Stefani, Monterano: riserva naturale, Rivista militare 1989; La Riserva Naturale Regionale Monterano: ricerca e gestione, a cura di Ufficio tecnico della Riserva Naturale Regionale Monterano, Canale Monterano 2011; http://www.monteranoriserva.com. The Agricultural University of Canale Monterano (Agricultural Association) was established in 1906; it administrates, manages and enjoys goods deriving from civic easements, regarding harvesting, sowing, grazing and wood; http://www.agrariacanale.org/statuto

Fig. 5
Border areas: wild and built components firmly bonded, generating an indivisible new whole.

a heritage. Main issue is the memory perception by people living this area, heiring a place now disconnected from current daily life but increasingly present as a business opportunity, primarily because of its touristic vocation. To encourage an enhancement plan, including economic profits, able to keep protected the recognized significances, not making use of natural resources and vestiges inherited as a deposit to take advantage of, gratifying financial interests trading upon them, come out as a chancy balance.

For the reasons mentioned, a deep investigation about the 'values issue' is to be pointed out, looking at achieving guidelines to plan a project aimed at safeguard memories, still existing or not, tangible or not. Pursuing this crucial objective, leading ambition is knowledge acquirement and spread, in order to promote the comprehension in approaching such a complex topic.The today-settlement of the village is characterized by border elements, qualifying the perimeter, determined by the peculiar geomorphological characteristics, also decisive for the city shape.

Actually, its layout shows up the urban and territorial logic, clearly visible from outside and internalsights, revealing green systems settled around the plateau, depending on the ground height variations and on the hydrological system of the valley. (Fig. 5) On the north-east limit, on a large floor, generating a profound suggestion, the complex of S. Bonaventura stands out, including the church and the convent, attributable to the second half of XVII century, in a state of ruin. The convent opens toward the eastern outlook; at side, a large open space links other building -the granary and the city walls-, creating a connective net of high value, asking for a vegetation regeneration. The church faces the village with its Berninian façade; it has no roof, but the central plan and apse survived; at its very center, a tree of considerable size rises, occupying the entire hall, with a dome

Fig. 6
S. Bonaventura church façade, looking the open space, upwards to the village.

shape crown: the image is commonly considered an iconic and mnemonic symbol of the decay. (Fig. 6) This peculiar case reveals a main point, namely the infesting plants: on one hand it constitutes a distinguishing quality of the present image, on the other hand it causes severe damages and makes maintenance operations difficult. For this reason, during the restoration works, vegetation thinning was strictly limited, in order to preserve a place main feature, consisting of architectures deeply involved in landscape. On the opposite side of the plateau, Palazzo Altieri and S. Rocco church remains emerge, immersed in the verdant plot and visible from near and distant sight, highlighting values of relationship with the close and wider context: between them, squares and free spaces open, where once the social life took place. Regarding this a remark arises upon Piazza Longa, still conserving its vocation as a distributive element of the urban system, expressing a significant testimonial interest. (Fig. 7) In the actual asset, difficult to perceive are the ancient city walls, making hard the urban layout understanding (inside-outside of the buildings), as the relationship with main architectures (S. Rocco, Palazzo Altieri, Santa Maria Assunta) and the territorial configuration. In addition to paths having both functional and structural historical value, nowadays spontaneous tracks, connecting each other's various elements, can be followed. Their arrangement should be reconfigured, to define an open-air museum itinerary, on the traces of the civilizations who populated the area -from prehistoric artifacts, Etruscan and Roman, up to the XVIII century-; it should include attention to environment qualities and landscape perception.

After the experience carried out during the restoration works on main architectures, recently a wider reflection has been advanced, involving researchers of different study fields, promoting conferences and exhibitions to diffuse new acquisitions on the topic, then to share a common route to base future actions on. Hitherward, some actions have been undertaken, trying to escape the dualism of Canale- Monterano couple, seen as two opposing roles of daily present and identity past, merely functional to the economic-touristic development of the first one, based on the historical and naturalistic heritage of the second one. In this regard, the local community and the government have been trying to find conscientious suggestions to base the managing of the territory on. The task is involving investigations and experimental works conducted by Sapienza University of Rome and Tuscia University, by Regional Natural Reserve, Canale Monterano Municipality, as well as by local associations and citizenship.[7] The synergy pursued, looking at the confluence of the various disciplines, is aimed at contributing the approach to heritage, considering that 'conservation' and 'innovation' are the founding terms of the *safeguard-development* issue. In view of future actions, Restoration as a discipline can indicate values, report risks, and supervise the project method depending on the degree of transformability identified. Considering the *safeguard development* dialectic, safeguarding the most ancient elements, constitutes an essential part of the development strategy concerning the whole urban and territorial system. To identify suitable procedures for heritage enhancement, considering space-environment and its pluri-dimensional character, deepening the aspects related to changing is necessary: the limits within the actions can take place are controlled by planning, as a result of analysis and considerations. The investigation upon the environment to deep the heritage in its wider sense, including the wild and anthropic components in their constitutive and transformation logic dynamics, can orientate transformations compatible with the whole of values.

[7] The volume Il Borgo di Monterano. Caratteri identitari e prospettive di valorizzazione, edited in 2018, recollect essays proceedings from the conference held in Canale Monterano -Incontro di Studi- on October 29, 2017; it also include some project compiled by the students attending the Faculty of Architecture, Sapienza-Università di Roma, exposed in the exhibition L'antica Monterano, Dati conoscitivi e prospettive di ricerca: alcune idee di progetto, Canale Monterano October 29-November 4, 2017. Book contributions by P. P. Balbo, S. Cecchini, F. Cesarano, S, Ciferri, F.T. Fagliari Zeni Buchicchio, F. M. Mantero, M. Nettekoven, G. Scarascia Mugnozza, M. P. Sette, F. Stefani, B. Tetti; Introduction by A. Bettarelli, D. Esposito, a cura di F. Cesarano, B. Tetti, Vetralla (VT), 2018.

[8] M. P. Sette, Per un approccio progettuale interrelato. Alcune esemplificazioni, in F. Cesarano, B. Tetti 2018, cit., pp. 35-46; G. Miarelli Mariani, Sviluppo, salvaguardia, e tutela nel paesaggio e Le azioni sul paesaggio, in Piani, parchi paesaggi, a cura di C. Muscarà, Roma-Bari 1995, pp.239-256 e 247-256; M. P. Sette, Restauro e tutela paesaggistica, in "Palladio", N.S. 26.2013,52, 144-147.

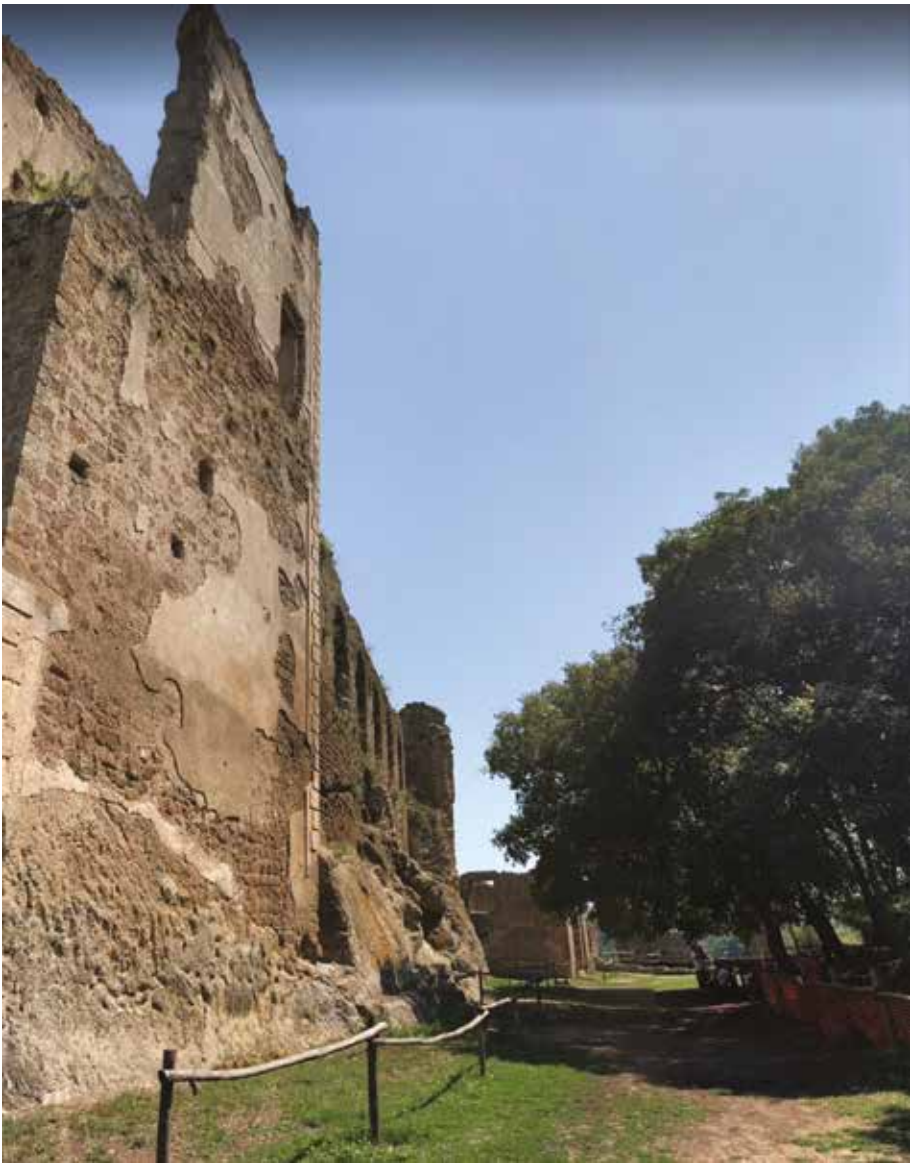


Fig. 7
Piazza Longa, alongside Palazzo Altieri in a foreshortened view.

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PLANNING AND MANAGING THE HERITAGE-LED REGENERATION OF INNER AREAS. THE SEXTANTIO EXPERIENCE IN SANTO STEFANO DI SESSANIO

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Santo Stefano di Sessanio (L'Aquila, Italy). The village after the 2009 earthquake; in evidence the collapse of the Medici tower. [Online]. Available from: <https://www.virtuquotidiane.it/cultura/santo-stefano-di-sessanio-parte-la-ricostruzione-della-torre.html> [Accessed: 4th September 2020].

This paper examines the transformation of the medieval village of Santo Stefano di Sessanio (L'Aquila, Italy) into a scattered hotel (*albergo diffuso*). In 1999, the Italian-Swedish entrepreneur Daniele Elow Kihlgren gave new life to this abandoned village, triggering a process of heritage-led regeneration. The project was called "Sextantio", from the toponym of the ancient Roman settlement located near the present-day town. This contribution analyses the methodological approach adopted to redesign the village and the criteria of architectural intervention applied to the historical buildings to accommodate new uses, considering, 20 years later, their pros and cons. By retracing the causes and consequences of the abandonment-rebirth of the place, this paper highlights Kihlgren's innovative skill in cultural planning and his ability to manage and systemically organize the project with a strong orientation towards coevolution with the reference environment. In this perspective, this study underlines the importance of an entrepreneurial operation of specific cultural relevance, addressing issues such as the conservation and enhancement of tangible and intangible heritage, the social use-value and the identity of places, but also the impacts of an extreme minimalism in conservation practices, the use of the village by an elite clientele and the long-term economic sustainability of the project.

Keywords: Inner areas, abandonment, heritage-led regeneration, traditional materials and construction techniques, Sextantio

Introduction

In 1999, Daniele Elow Kihlgren, an Italian-Swedish entrepreneur, turned the medieval village of Santo Stefano di Sessanio (L'Aquila, Italy), 1250 meters above sea level, at the foot of the Gran Sasso mountain, into a scattered hotel (*albergo diffuso*) (Fig. 1). In the early twentieth century the village counted a thousand inhabitants, but they dropped to one hundred by the end of the century. Just like many other urban settlements in the Abruzzo hinterland, Santo Stefano di Sessanio experienced economic decline and several natural disasters (the last one being a ravaging earthquake in 2009) which led to a substantial loss in population, the fragmentation of estates and the loss of ancient-old traditions. Kihlgren's intuition consisted in not just buying village houses to turn them into a scattered hotel, but in triggering a process of cultural and economic development that reversed the place's uninterrupted trend of abandonment and decline. Approximately 3,500 square meters of the village of

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Fig. 1
Santo Stefano di Sessanio (L'Aquila, Italy). General overview of the medieval village [Online]. Available from: <https://www.sextantio.it/santostefano/abruzzo/> [Accessed: 4th September 2020].

Santo Stefano were thus recovered and restored: guest rooms were created inside ancient buildings, local craft shops and wine and food cellars were reopened, and an excursion centre and a conference hall were set up. The whole project was called "Sextantio", from the toponym of the ancient Roman settlement located near the present-day town.

Analysing this site-specific experience – also in the light of recent projects by the Sextantio group and the Dom company[1] – is a chance to remind the scientific community of a common problem for many Mediterranean countries: the conservation and proactive management of the so called "inner areas", that is areas far from essential services (education, healthcare, mobility), of high environmental and cultural value, very different from

[1] Sextantio group and Dom company also carried out the project *Le Grotte della Civita*, in Matera, in the Basilicata region. This tourist accommodation is located in the oldest part of the Sassi quarters, called *Civita*, overlooking the Gravina stream and facing the Murgia park. It features 18 rooms and an ancient cave-church. Sextantio website: <https://www.sextantio.it> [Accessed: 2nd September 2020].

one another, as a result of natural events and human activity that occurred over the centuries. After the Second World War, many of these areas were progressively depopulated and marginalized: it is estimated that today, in Italy, 72% out of 8.000 municipalities count less than 5.000 dwellers, and that more than 2.000 settlements, including the ones already risking extinction, have already been abandoned and are in an advanced state of architectural decay (Dezza, 2020). Given the urgency of the situation, for several years the topic of regeneration of inner urban and rural areas has been at the hearth of national and international policies, aiming at turning them into drivers of active development. In Italy, more specifically, the reference policy is the National Strategy for Inner Areas (*Strategia Nazionale per le Aree Interne*, SNAI), which has been developed since 2012. Acknowledging the specific spatial dimension of these areas and drawing on polycentrism and on the promotion of open and innovative local communities, this Strategy is currently planning to reactivate 72 inner areas, in line with the objectives of the EU Cohesion Policy, that is the European Union's main investment policy (Accordo di Partenariato 2014-2020, 2013; European Commission, 2014). Moreover, in the last few months, with the CoVid-19 pandemic, the need to regenerate inner areas has become all the more topical: the healthcare crisis the world is experiencing calls for regeneration plans that take into consideration new, post-pandemic ways of conceiving and using space, especially for tourist and hospitality purposes (Compagnucci, 2020).
Although revived before the definition of the above-mentioned National Strategy, Santo Stefano di Sessanio is nevertheless an interesting case study on the regeneration of inner areas. The following notes focus on the methodological approach adopted to redesign the village and on the technical-operational solutions applied to architectural intervention in historical buildings in order to accommodate new uses, considering their pros and cons about 20 years later. [CM]

The Sextantio cultural imprint: value recognition, extraction and redistribution

Reinventing fragile areas. A heritage-led and co-evolutionary approach

The recognition of the economic value of cultural heritage and, in turn, the promotion of culture to spur local economic growth are not new goals, although relatively recent ones. The transition from an economic development model based on large companies to one centred on the re-evaluation of local resources first appeared at the end of the 1960s, when the risks of an overly homologating strategy gave way to a site-specific approach, in which culture and the endogenous factors are no longer considered as limits but as development drivers (Barbetta *et al.*, 2013). The transformation of the medieval village of Santo Stefano di

Fig. 2-3
Santo Stefano di Sessanio (L'Aquila, Italy). Guest rooms of Sextantio scattered hotel; in evidence the wall and floor finishes, the recovered ancient furniture and the new bathroom fixtures by Philippe Starck [Online]. Available from: <https://www.sextantio.it/santostefano/abruzzo/> [Accessed: 4th September 2020].

Sessanio fits into this framework and owes much to Daniele E. Kihlgren's value motivation – or rather orientation towards the cultural and economic value – whose entrepreneurial feat had a specifically cultural imprint. Kihlgren, on the one hand, conceived the area as an enabling platform for local innovation, and on the other hand considered its cultural heritage as the key element in the production system and as an asset for social development. These were the basis of a mechanism of recognition, extraction and redistribution of tangible and intangible value that made the Sextantio project possible.

At the heart of the entire operation is a conception of culture as something useful, where "use" doesn't mean "consumption" but rather "conservation". The project relaunches the social use-value of historic buildings and revives them updating their typically residential function and focuses on the experience offered to tourists by these accommodation facilities. This is the path that led Kihlgren from residential buildings to a scattered hotel, thus entering the world of hospitality, an issue that fits well into the concept of heritage as a common good. The scattered hotel format fully meets Kihlgren's objectives: unlike standard hotels, it does not develop vertically but horizontally, it transforms existing building units and taps into local human resources. The company managing the hotel is therefore firmly rooted in the area to which it gives new impetus, while it recovers its buildings in a sustainable way and promotes their local typical character. The cultural heritage of Santo Stefano – architectures, landscapes, crafts and traditions – thus becomes an essential part, or rather the core of the tourist offer, establishing a link between the area and tourists, between local and global.

Tourist reception also develops into a true culture of hospitality, stressing the importance of the relational and social component of the project. As for Kihlgren's network of relations, it is worth noting that he has given far more importance to the actors of the transformation process, rather than to actual tourists, whose flow changes from one year or month to another. After purchasing the village, the Italian-Swedish businessman started important collaborations with construction companies and local craftsmen who recovered and restored the historic buildings for contemporary use. The collaboration with local stakeholders on the one hand anticipates the recommendations of the European Union on *Community-led Local Development* (CLLD) recognized «as a tool of the Cohesion Policy 2014-2020 for local, rural, urban and peri-urban development» (European Economic and Social Committee, 2014) and on the other, strengthens the sense of belonging to places and promotes responsibility towards heritage. The community built by Kihlgren, however, doesn't fully fit into the concept of *Heritage Community*, as it will later be formalized in the Faro Convention, as it doesn't properly «consist of people who value specific aspects of cultural heritage which they wish, within the framework of public action, to sustain and transmit to future generations» (Council of Europe, 2005, art. 2b), but is rather made up of companies and workers driven primarily by economic goals. Despite the Sextantio project pillars undoubtedly being

Fig. 4
Santo Stefano di Sessanio (L'Aquila, Italy). Guest rooms of Sextantio scattered hotel; in evidence the wall and floor finishes, the recovered ancient furniture and the new bathroom fixtures by Philippe Starck [Online]. Available from: <https://www.sextantio.it/santostefano/abruzzo/> [Accessed: 4th September 2020].

Fig. 5 - 6
Santo Stefano di Sessanio (L'Aquila, Italy). Some common rooms of the Sextantio scattered hotel: the dining and tea room [Online]. Available from: <https://www.sextantio.it/santostefano/abruzzo/> [Accessed: 4th September 2020].

culture and heritage protection, tourists also end up replacing here the "community of local inhabitants" with a "community of foreign users" who live in the village temporarily and feed the economic machine.

Nevertheless, in spite of these observations, the mutually beneficial relation between economy and culture guided the transformation of the village into a scattered hotel, where economy benefits culture, and it thrives in turn, thanks to the strategic development of cultural activities (Barbetta *et al.*, 2013). The combination of all these approaches conceptualizes Kihlgren's heritage-led and co-evolutionary approach to the regeneration of fragile areas which stands out for its innovative cultural planning skills and for the ability to organize and systemically manage it with a strong orientation towards «co-evolution with the reference environment» (Paniccia *et al.*, 2010, 92). The result is an entrepreneurial idea based on a dialectical and dynamic relation between environment and business as a driving force for change but also for conservation; the bet to enhance this inner area is truly based here on the concept of "conservation in transformation".

The success of the final operation remains, however, largely dependent on the solutions of physical and spatial transformation of this rural settlement, for which the recovery of traditional materials and construction techniques is undoubtedly a valuable starting point. [CM]

Fig. 8
e Grotte della Civita, Matera (Italy). General overview of the Sassi landscape [Online]. Available from: <https://www.sextantio.it/legrottedellacivita/> [Accessed: 4th September 2020].

Fig. 9
Le Grotte della Civita, Matera (Italy). Guest rooms of Sextantio scattered hotel [Online]. Available from: <https://www.sextantio.it/legrottedellacivita/> [Accessed: 4th September 2020].

Enabling minor cultural heritage for new uses. Materials and construction techniques

When Kihlgren began his adventure, the Medici village was in a state of complete abandonment with just under a hundred people living there; 75% of the buildings were mostly deserted and partly in ruins, but the «magical and seductive relation between historical buildings and the area» was, in the eyes of the young entrepreneur, the true asset value of the place (REPORT, 2011). Historical buildings were recovered using traditional techniques and the signs of wear and tear were preserved as an added value. In order to maintain the historical and typological features of the buildings and turn them into business, be them tourist or real estate, Kihlgren adopted an approach of integral protection of local architectures, discarding some principles of modern hospitality but also regulatory constraints, or such a complete and utter conservation of the existing building features would have been, *de facto*, impossible. Door and window were not changed, the original intended use of rooms and internal divisions were preserved and the steep wooden or stone stairs that connected the floors were reused. The floor decks were made of wood reused or processed in an old-fashioned way and for floor finishes only recycled bricks,

stone and wood were used. The original plasters were consolidated and more often restored, sometimes coated to give them a "lived-in look". The local craftsmen were so skilled here, that it is very difficult to spot the modern plants installed, and to tell what is authentic and what is not: old fireplaces, found on site, were preserved and the heating plants were hidden under the ancient floor finishes (Figs. 2 - 4).

The attention paid to traditional materials is also translated into attention to the local culture. Rooms feature antique furniture (beds, cupboards, chests) of a strictly "poor" style, that is, devoid of any ornament and of local origin like the stone washbasins, perhaps found on site or in abandoned ruins nearby. Kihlgren initiated ethnographic studies and research on local culture, talking to older people – in some cases the last evidence of a world destined to disappear – and used iconographic material, especially from the Scheuermeier Archive, a valuable source of information for interiors in the Abruzzo region. He collaborated with anthropologist Nunzia Taraschi and with the researchers of the Museum of the People of Abruzzo (*Museo delle Genti d'Abruzzo*) and resumed ancient weaving techniques, hiring locals to sew sheets and blankets for the hotel (REPORT, 2011). There are no televisions or minibars

Fig. 10
Le Grotte della Civita, Matera (Italy). Guest rooms of Sextantio scattered hotel [Online]. Available from: <https://www.sextantio.it/legrottedellacivita/> [Accessed: 4th September 2020].

in the rooms, the only modern amenity being the wifi network and the bathroom fixtures designed by Philippe Starck. Kihlgren explains: «I'm preservative, not conservative: I love contemporaneity, I don't want guests to be uncomfortable and, to avoid museum fetishization, I organize concerts, meetings, theatre readings. In short, I do not support an apology of rurality» (REPORT, 2011). His research is feverish, almost exasperated, and it also applies to food: he cultivates ancient seeds near the village and offers guests food that has disappeared from the rural tradition (Figs. 5 - 6).

The idea is clear: to give back dignity to Italy, to its minor cultural heritage and to its landscape. In a nutshell, true, local and authentic. The successful formula of the "Kihlgren method" can be summed up in Italian with the acronym RARO (*Restauro*, *Autenticità*, *Rispetto*, *Onestà*), meaning "rare", that is Restoration, Authenticity, Respect and Honesty. As the entrepreneur writes, «when we intervene, we ask municipalities to forbid anyone from building anything, only Restoration is allowed. We ask for Authenticity, by proposing a new type of tourism. We want Respect for the landscape, anthropological, historical and architectural identity of the place we transform. Before starting renovation in Santo Stefano, we recorded hours and hours of interviews with those who left the

village, to find out what it was like in their time. And finally, we ask for Honesty because if you want good results, you must be honest» (Giannella, 2013). [AU]

Sextantio +20

In the years right after the opening of the scattered hotel, Sextantio achieved great successful, both locally and internationally. The operation was systemic and involved local stakeholders, stressing the importance of non-traditional strategies to promote economy and tourism; it was not just a business, or a commercial bet but an operation that took into account ethical, social and cultural issues going beyond pure market interests. The company created by Kihlgren (Sextantio) hired 25 employees and created jobs for another 300 people in the related industries; the village counts today 23 inns and bed and breakfasts, and, after half a century of depopulation, people have started moving back. In 2015, there was a surge in requests to buy ancient holiday houses in Abruzzo, especially from the UK. Walter di Martino, Head of Communication at Gate-away.com, praised, in that same year, the high-quality regeneration of the village of Santo Stefano di Sessanio attracting investments and developing quality tourism, an opinion shared by the foreign real estate columnist of The Guardian. This re-development was so good, also at a structural level, that the buildings restored with traditional techniques by Kihlgren were not affected by the 2009 L'Aquila earthquake, which destroyed the Medici tower in the ancient village (Fig. 7).

Despite a substantially positive assessment of the project, it is nevertheless worth highlighting some of its negative aspects both in terms of intervention on historical buildings and of consequences on the area. As stated in the "guidelines" drawn up by Kihlgren, no recognizable interventions are allowed in the recovered artefacts, the only exception being sanitary ware and the skilfully concealed plants. The imitation of the past is nevertheless exasperated, also in finishes, by producing that *ad hoc* "patina of time" effect, as if the history of the building and the place were not enough. The search for authenticity sometimes seems to be confused with a typical contemporary taste that exaggerates the aesthetics of deterioration and imperfection, as mentioned by Hernádez Martinez. The overall outlook, especially of the interiors, seems to freeze the effects of decay, or even "simulates" the incompleteness of the building, pursuing an almost minimalist attitude (Hernández Martinez, 2013). There is no doubt, however, that the final result is particularly appreciated by end users, according to the reviews on the portals of e-commerce companies, even if the high prices make Sextantio a niche destination, mostly for foreigners.

The risks of such a reuse of ancient buildings and their surrounding areas, however, are high.

First of all, the place comes to be perceived from users as exclusive, for the benefit of a few, to be visited occasionally and sometimes seasonally, which is a reversal of the original purpose. Secondly, the economic system that has developed and that revolves around the Sextantio company is strongly influenced by it, almost depending on it for its very survival. Despite promoting a development model that gives back respect and dignity to the identity of the place and revives the inner area, there's a radical change in the project key principles: heritage is preserved today by enlightened entrepreneurs and rich tourists, while it once was supported by an egalitarian community whose life depended on the "craftsman" skills well rooted in historical, cultural and anthropological traditions. [AU]

Conclusions

This paper addresses the process of heritage-led regeneration of the medieval village of Santo Stefano di Sessanio in central Italy. In retracing the causes and consequences of the abandonment-rebirth of this Abruzzo settlement, it reflects on the value that entrepreneurial operations of specific cultural relevance have in helping fragile territories to become economic, social, cultural and environmental drivers.

A similar consideration also arises from the comparison with a recent document drawn up by the International Council on Monuments and Sites (ICOMOS), under the aegis of the European Commission, in the framework of the *Cherishing heritage* initiative, promoted during the European Year of Cultural Heritage (European Commission, 2018): *European quality principles for EU-funded interventions with potential impact upon Cultural Heritage*. The aforementioned document identifies 7 quality principles for interventions on cultural heritage, i.e. *knowledge-based*, *public benefit*, *compatibility*, *proportionality*, *discernment*, *sustainability* and *good governance* (ICOMOS, 2019). Reading through these principles it is realized that Santo Stefano di Sessanio is in line with current international recommendations and, in a way, a precursor to them; at the same time, it meets the need of many other Italian villages to use space differently, which emerged strongly during CoVid-19 pandemic. The reasons behind marginalization of inner areas – low density in population and production, lot of space available, contact with nature – become, in an era of social distancing, a driver for urban and architectural regeneration, for a new approach to public and private places and for an economic recovery centred on a smarter and greener development of rural areas (Cavestri, 2020). Knowledge, economic revitalization, tourism on a European scale and quality of restoration/

conservation works in general are the main strong points of the Sextantio project, while long-term economic sustainability – in 2017 Sextantio was forced to close and reopen only months later and Kihlgren to review his investment plans (Signori, 2017) –, an elitist use of the village – a phenomenon seen for example in the *Pousadas de Portugal* (Fantini *et al.*, 2019) – and exasperated imitation of the past are among its week points.

To conclude, the Sextantio project has established a close collaboration with local stakeholders and it has shown that scattered hotels, if well designed and managed, can play a crucial role in promoting local competitiveness with significant benefits for national and international tourism, but it has also given new life to the village itself, although it looks a bit too artificial and affected for those working in heritage conservation and enhancement. The critical analysis carried out here does not change, however, the positive assessment of the operation. It must be noted, though, that the Abruzzo concept was then replicated in other areas only in its formal aspects but not as a tool for the regeneration of abandoned and fragile villages, see for example the project carried out in Matera in 18 *Sassi*, lent by the Municipality as a permanent loan, and restored without altering their original features (Figures 08-10). The "Kihlgren method" was applied here to a different setting, to a place not running any risk of marginalization, where the transformation of abandoned heritage sites into bed and breakfasts had already started some time before, as Matera has been recognized as a UNESCO World Heritage Site since 1993 and later on the city would also become 2019 European Capital of Culture. [CM, AU]

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THE CASTLE OF SANT'SPOLLINARE IN MARSCIANO (PG), SURVEY, DOCUMENTATION AND PROPOSAL TO ENHANCE THE CULTURE OF THE OLIVE TREE IN A MEDIEVAL VILLAGE AT RISK OF ABANDONMENT AFTER SEISMIC EVENTS

The est side. During the 3D Laser Scanner survey campaign, following the various structural analyzes, supported by historical documentation.

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The Castle of S. Apollinare is located in Umbria, in the province of Perugia, in the municipality of Marsciano. Known already in Roman times for the presence of a votive altar dedicated to Apollo and for its border position on the Byzantine Corridor, it became Castrum in the second half of the 1300s and strengthened simultaneously with the other fortifications in the area. Located in defense of the Farfa abbey in the Porta Eburnea countryside, in 1416 it was absorbed by emphyteusis from the Benedictine abbey of S. Pietro da Perugia. The Castle is characterized by the oblong and elliptical planimetric shape and by the imposing tower ended by Guelph battlements on hanging arches, which houses the north gate. It was hit by the seismic events that hit Spina and Marsciano in 2009 and is the subject of damage repair, seismic improvement and local strengthening interventions. Interventions that involved the reconstruction of the roof, the consolidation of the floors and integration interventions on the load-bearing walls.
The complex is made up entirely of sack masonry and mixed blocks of freshly hewn stone and brick bricks and lime mortar and river sand. During the 3D Laser Scanner survey campaign, following the various structural analyzes, supported by historical documentation.
The reconstruction of the history of the building and of the stratigraphy parallel to the analysis of the most evident pathologies have led to many hypotheses of a static and structural character. Therefore, an attempt was made to give the castle a new life by enhancing the oil production process by promoting the agritourism component and hypothesising participatory and interactive teaching with a museum itinerary. The residence maintains its function as a receptive structure while the distribution is articulated around the well of the cistern. Testimony of local agricultural traditions is the production of olive oil by preparing in overlapping boxes to dry and not make the olives mold before pressing. The restoration of this peculiarity will provide the village and the production activity carried out in it with an added and significant historical-cultural value.

Keywords:
Corridoio Bizantino, medieval village, Survey, documentation, enhancement, recovery

The Castle of S. Apollinare is located in Umbria, in the province of Perugia, in the municipality of Marsciano. Known already in Roman times for the presence of a votive altar dedicated to Apollo and for its border position on the Byzantine Corridor, it became Castrum in the second half of the 1300s[1] and was fortified at the same time as the other fortifications in the

[1] In, Fabbretti A., Bonaini F., and Polidori F. (1850), Cronaca della città di Perugia dal 1309 al 1491 nota col nome di

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Aerial Photograph Of The Village. The Castle is characterized by the oblong and elliptical planimetric shape and by the imposing tower ended by Guelph battlements on hanging arches, which houses the north gate. Image by Google Maps.

The north gate is characterized by a tower closed at the top by guelph battlements and persyl arches: this is the entrance gate facing Perugia along the ancient via Orvietana.

area. Situated to defend the Farfa Abbey in the Contado di Porta Eburnea, in 1416 it was absorbed on lease by the Benedictine abbey of S. Pietro in Perugia[2].

Arriving from Perugia along the Via Settevalli with the castle of Spina on the left, the fortress and the castle of Sant'Apollinare are in the foreground, then from west to east Monte Petriolo, Cibottola, Monte Vibiano Vecchio and Mercatello nestled atop a rolling hill[3], the valley opens out, split by the winding Nestore river. From the Montepugliano locality, a privileged viewpoint as its location is higher than the abbey and the castle, a view spanning one hundred and eighty degrees sees sunrise accentuating variegated hues of the green olive trees, pines and oaks, while the glowing sunsets silhouette a procession of black cypresses on the ridge where, hidden, there is the small church of Santa Lucia. Here the natural landscape embraces agricultural land with its aesthetic modifications, a result of the creative activity of the communal age, the discerning exploitation of plain and hill. We are in the proximity of the Byzantine Lake estuary namely the presentday River Nestor[4]. The Castle is characterized by its oblong, elliptical planimetric

Diario del Graziani secondo un codice appartenente *ai Conti Baglioni*, Vol. 16, No. 1, Firenze, Leo S. Olschki, pp. 69, 71-750.

[2] Mariotti A., Memorie istoriche de castelli e ville del territorio di Perugia: Porta Eburnea, ASP, ms. CM 297, s.d.

[3] Piccolpasso Cipriano, Le Piante et i ritratti delle città e terre dell'Umbria sottoposte al governo di Perugia, 1963 Perugia.

[4] Valentini, G., Il Castello di S. Apollinare a Marsciano, proposta di valorizzazione della cultura dell'olivo, Tesi di Specializzazione, Università degli studi di Firenze, A.A. 2019/2020, relatore Prof. Maurizio De Vita, corr. Prof. Giovanni Pancani.

shape and the imposing tower embellished with Guelph battlements on hanging buttresses where the north gate is housed. The complex is made entirely in mixed sack masonry , ashlars of roughly hewn stone and clay bricks with lime and river sand mortar. It was hit by the earthquake that struck Spina and Marsciano in 2009 and has since undergone restoration, seismic consolidation and specific reinforcement. Interventions involved the reconstruction of the roof, consolidation of the floors and integration work on the load-bearing walls. During the research survey, following the various structural analyzes, assisted by historical documentation, and in particular, the comparative analysis of the fortified structures[5] in the area, it has been possible to reconstruct a fairly detailed and reliable historical framework which has allowed us to identify the different ages of the structures and their original functions, and therefore the causes of circumstances of degradation. The reconstruction of the buildings' history and stratography together with the analysis of the more evident pathologies have led to several static[6] and structural conjectures, with the identification of some areas of the castle that could reveal hidden parts that have remained hitherto unknown. Other analysis included research into the problems caused by botanical risk and trees that led to a felling project with targeted greenery replenishment[7]. The building complex is made up entirely of mixed masonry of roughly hewn stone blocks of various dimensions and clay bricks, with plaster present on certain areas of the surfaces, as can be clearly seen from the elevations. The interventions, also after periods of reconstruction and maintenance in different eras over time, reflect their diverse techniques and use of rubble, recycled and/or waste materials. Some high quality construction details such as the cantonal of hewn stone, the arched doorways in carved stone and terracotta bricks and brick flat-band windows, enrich the typical traditional aspects of local rural architectural heritage. Not all the corners are made of stone but also with bricks of varying sizes. Of notable value are the brick walls in the buildings overlooking the courtyard with a cistern and along the left wing of the castle, where mensiochronological analysis is necessary. Where stone is used in the masonry evident reuse of recycled material from other buildings emerged, or from buildings demolished over time , or in any case found in the immediate vicinity as quarries are not present in the area. The territory of Marsciano has no stone quarries but is historically linked to the brick tradition from time immemorial. A tradition confirmed by the presence of production where the high quality is recognized both nationally and internationally. The brick masonry reflects the historical evolution of

[5] Brandi C., Teoria del restauro, Einaudi, Torino 1972.
[6] Giovannoni G., Les moyens modernes de construction appliqués à la restauration des monuments, in AA.VV., La contruction des monuments d'art et d'histoire, pp.179-184, Atene-Parigi, 1933.
[7] Valentini, G., Il Castello di S. Apollinare a Marsciano, proposta di valorizzazione della cultura dell'olivo, Tesi di Specializzazione, Università degli studi di Firenze, A.A. 2019/2020, relatore Prof. Maurizio De Vita, corr. Prof. Giovanni Pancani.

The sud gate. The complex is made entirely in mixed sack masonry , ashlars of roughly hewn stone and clay bricks with lime and river sand mortar. Da Amoni D., Castelli, fortezze e rocche dell'Umbria, Perugia, 1999.

It was hit by the seismic events that hit Spina and Marsciano in 2009 and is the subject of damage repair, seismic improvement and local strengthening interventions. Interventions that involved the reconstruction of the roof, the consolidation of the floors and integration interventions on the load-bearing walls.

the brick itself in the territory of Marsciano[8], in fact, after attentive study we can detect the periods of production, the different sizes and the different mixtures of clay used over time. The cornerstones in roughly squared sandstone come for a certainty from quarries in the Trasimeno hinterland, where the presence of quarries has, over time, reflected the characteristics of the constructions in the area. The presence of minute pieces of stone masonry, interspersed with brick chippings, implies the difficulty in finding raw material[9] in the area, hence the resort to that of poor quality obtained from the neighboring land surfaces. This masonry shortage was made up for by the plaster using mortar with lime and sand obtained from along the Nestore river. The same lime mortar was used for the masonry. The lime used as a binder from time immemorial was produced in limited quantities in the nearby territory of the Castle of Cibottola in the neighbouring territory of Piegaro. By cataloguing each wall section, observing and documenting the analysis of the various wall textures to understand the stratigraphy and the historical succession of the interventions, the recognition of the various architectural types and the

[8] Amoni D., Castelli, fortezze e rocche dell'Umbria, Perugia, 1999.
[9] Giovannoni G., Les moyens modernes de construction appliqués à la restauration des monuments, in AA.VV., La contruction des monuments d'art et d'histoire, pp.179-184, Atene-Parigi, 1933.

exact identification of the nature of the deterioration we could then scrutinize the causes and put forward pertinent recommendations. For the external facades the proposal foresaw the cleaning of the stone, brick and mixed walls, and the removal of devitalized and inorganic organic patinas and medium-adherent deposits to be carried out by hydro-cleaning equipped with a rotating head nozzle, and subsequent treatment with an adequate basic solvent product, brushing, rinsing. Precise and limited cleaning of the brick surfaces to attenuate the thickness of the calcareous concretions by means of light hydro-sandblasting with a rounded siliceous abrasive. Generalized surface protection treatment with spray application of water-repellent based on an alcoholic solution of silanes, taking care to protect the surfaces from direct sunlight and rain during and up to a week after treatment. A proposal was made to give the castle a new lease of life by enhancing the olive oil production process and by promoting agritourism, and also by proposing didactic interactive participation with a museum itinerary. The residence maintains its hospitality function while the sales area is articulated around the cistern well. Testimony of local agricultural traditions is the production of olive oil by stacking the crates to dry out the olives thereby preventing mold forming before the pressing process. This characteristic adds to the village and its productive activity significant historical-cultural value. In the past, lamplight oil was also produced.

Testimony of local agricultural traditions is the production of olive oil by stacking the crates to dry out the olives thereby preventing mold forming before the pressing process. This characteristic adds to the village and its productive activity significant historical-cultural value. In the past, lamplight oil was also produced.

The commercial area is articulated around the perimeter walls and the two main entrances, one from the courtyard to the east and the one from the north door, around the large cistern. The redevelopment of the green area to the west is planned with the creation of an equipped park. The courtyards inside the village can be used to hold temporary exhibitions.

The intervention aims to enhance the village by promoting a solid hospitality component with flexible accommodation to suit all needs ranging from hostel to rooms with ensuite bathrooms. The commercial area is articulated around the perimeter walls and the two main entrances, one from the courtyard to the east and the one from the north door, around the large cistern. The redevelopment of the green area to the west is planned with the creation of an equipped park. The courtyards inside the village can be used to hold temporary exhibitions.

It is quite probable that in the 14th century this small hill town became part of the tight network of Castra which included Pila, Badiola, Spina, Monte Lagello, Complignano, Migliano, Poggio Aquilone and Marsciano, centers which, located along the Via Orvietana known today as the Seven Valleys, had the function of defending the road that connected Perugia to Marsciano. Sant'Apollinare, an invaluable checkpoint due to its strategic position, represented an important setting for Perugia for agricultural exploitation. For the ancient municipality, in fact, all the lands present in this vast rural area around Marsciano responded to the need to colonize a part of the countryside able to offer great opportunities for agricultural development because of the rich natural resources of the land continuously fed by abundant waters from the rivers that still flow there. With the territorial expansion of Perugia, which took place between the twelfth and thirteenth centuries, by the end of the fourteenth century the countryside over which the

city dominated had a tight network of castles within its boundaries. If once, individually or in small groups, these fortified villages were able to identify themselves as noble units, once they became part of the territory of the dominant city, it is in the Municipality of Perugia that they found "a unifying approach". The overall framework of the ancient court of Sant'Apollinare dates back to the period between the eleventh and twelfth centuries as a result of a rapid increase in the size of the population within the Perugian territory near the monastic foundation. It probably takes its name from this. A first hypothesis is that on this hill there was an altar dedicated to Apollo venerated as protector of agriculture: wheat on the plain and on the hill the olive trees. The presence of a hidden spring does not exclude the altar once being close to the actual castle even if the abbey, higher up, dominating the area, seems its most suitable place. Later, starting from the edict of Constantine which promoted Christian tolerance and ending with the one the emperor Theodosius' where the death penalty punished both the practice of pagan sacrifices and even the mere attendance at a temple, times were ripe anyway to replace the pantheon of pagan deities with the cult of saints. So is it the cult of the god Apollo that turns into the cult in Sant'Apollinare? Maybe. Going walking through, a narrow uphill street with steps divides a sequence of small houses, some with vegetable patches and gardens: in the village dwelled laborers and artisans. Then an open

A proposal was made to give the castle a new lease of life by enhancing the olive oil production process and by promoting agritourism, and also by proposing didactic interactive participation with a museum itinerary. The residence maintains its hospitality function while the sales area is articulated around the cistern well.

space to the east where there was an additional entrance to facilitate the loading and unloading of carts and for herds, then continuing upwards a courtyard, on the left where the extensions of the main buildings of the castle overlook, which peasants were allowed to use. Here the village ends, a fifth wall with a door divides it from the lord's palace which enclosed a courtyard, private when necessary, with a large cistern and two portals, one in richer stone, the other in terracotta. These do not face each other, as if to establish a clear hierarchy. It was from the first that S*ignore* entered. This can be sensed not only because of the seventeenth-century stone portal, the result of a subsequent renovation, but in particular for the walkway that starts from the first floor, half of which is on the surrounding wall and the other on buttresses, towards the courtyard. The walkway connects the palace with the crenellated tower that could be fortified in the event of a siege which, given its size, was expected to be short-lived[10].

[10] Valentini, G., Il Castello di S. Apollinare a Marsciano, proposta di valorizzazione della cultura dell'olivo, Tesi di Specializzazione, Università degli studi di Firenze, A.A. 2019/2020, relatore Prof. Maurizio De Vita, corr. Prof. Giovanni Pancani.

Plaster on internal walls has been completely or arbitrarily removed to make adjustments and to rework the brickwork, much to the detriment of the decorative elements that could have been hidden in the layers of plaster without carrying out the necessary instrumental investigations. Going downwards from the north door there is a garden that can be redeveloped and also equipped with seats and made accessible for the disabled. The integration of the greenery is supplemented with fruit tree such as: apple, pear, peach, plum, cherry, almond and fig. The organization of an educational demonstration orchard is planned. Examples of local tall trees and bush species are included.

The building complex ,as stated earlier, consists entirely of mixed masonry of roughly hewn stone of various sizes and bricks, as can be clearly seen from the facing elevations. The types of intervention, also as a result of reconstruction in various eras over time, reflect different techniques and use of recycled and/or waste materials. Some valuable construction details, such as the cornerstones in squared *pietra serena*, the arched entrance portals in worked stone, brick bricks and the brick platbands of the windows, enhance the traditional aspects typical of the local rural architectural heritage. The brick walls of the buildings that overlook the courtyard with a cistern and along the left wing of the castle complex are notable for their. For the stone masonry there is a strong reuse of recycled material from buildings in ruins and/or demolished over time, and in any case found in the immediate vicinity as the area is free of quarries. This absence of masonry was made up for with plaster with lime mortar and sand obtained along the underlying Nestore river. The same lime mortar was used for the masonry. The lime used as a binder, from time immemorial was produced in limited quantities in the nearby territory of the Castle of Cibottola in the neighbouring territory of Piegaro. The building shows serious signs of deterioration due to various factors that can be grouped into three main categories: extrinsic causes due to human action, which has transformed or modified and removed bearing walls and altered the heights. Congenital factors that are due to the characteristics of the chemical composition, the porosity and the internal structure of the material, which in turn depend on the nature and composition of the source material and the peculiarities of processing and kilning. Others, external factors: they are due to the action of external agents such as water, wind, pollution, biological attack. It is particularly the presence of water that causes the greatest alterations of the material, causing both physical (freezing) and chemical (sulfation, carbonation, etc.) effects. Natural extrinsic causes with prolonged action over time: water infiltration into the supporting structure, driving rain that ruins the plaster and facade decorations, rising water by capillarity which causes efflorescence and peeling plaster: biological aggression caused by plants such as mosses, lichens and real trees that with their roots distort the floors or foundations and the leaves

degrade the roof of the building; the aggression caused by animals such as flying pigeons that have colonized some places. And finally; intrinsic causes of construction: humidity dries up in time proportional to the considerable thickness of the walls, limestone and pietra serena are materials of short duration. As for the external appearance: the facades have a faded color due to the removal of pigments, with cracks and plaster peeling that have brought the masonry underneath into direct contact with atmospheric agents. The façade decorations such as the eaves, the string courses and the window frames are also compromised. Of the facades, the one to the south-east is in the worst condition.

The entire complex of Sant 'Apollinare, since its origins, has based its existence on the profits drawn from the crops that were cared for in its lands of dominion: among these for excellence was the production of fine oil. The almost complete state of abandonment of the complex, except for a few private buildings in the village, does not guarantee a promising future. One tries to propose a "new life" for the castle and surrounding spaces. Promote the cultivation of the olive tree and its precious "green gold" involving the external and internal environments of the castle by inserting them in a sensory journey aimed at immersing the visitor or guest in this suggestive dimension. The complex must have as its functional destiny: a) maintenance of the housing part (upper floors) with rigorous development of the agritourism component; b) reuse of the warehouse-storage rooms for the products of the cellars with the recovery and restoration of the centenary barrels, of all the equipment connected to the oil supply chain. This area must be recovered with a study of revaluation of local traditions in order to insert it in a museum and educational path that interests and involves the village.

In conclusion, the castle of Sant 'Apollinare will therefore relive a new life. The building, always used as a residence since the year 1050, will house an accommodation facility for different price ranges: from the hostel on the ground floor to single and double rooms with bathroom on the upper floors. To facilitate vertical distribution that is not always up to standard, an elevator will be installed in the south wall, made of corten steel and glass. Initially glass was preferred to steel but paradoxically the transparency and properties of the former, strongly conditioned by the temperature as it is positioned on the south side, it was decided to make it mainly in corten steel. Both for the supporting structure and for the panels that compose it on all levels. The mill will return to operation while the miller's house will be destined for unites autonomous, finished and furnished, suitable for hosting customers with special needs.

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FRAGILITIES AND RESOURCES OF DEPOPULATED VILLAGES IN CADORE: REACTIVATION INITIATIVES AND THEIR IMPACT ON ARCHITECTURAL HERITAGE

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Traditional rural building "tabià" in Dosoledo (Comelico Superiore), part of the "Troi d' li mascri", a path dedicated to the local carnival. (photo by C. Valiante, 2020).

This contribution aims to introduce some considerations regarding the Italian alpine regions' very marginal and peripheral areas, which demonstrated to develop various initiatives for the reactivation of their small villages, despite the severe depopulation trend observed during the last decades. The paper will focus on the case of Cadore, in the northern Belluno province, in the Veneto Region. This context is characterized, at the same time, by various fragilities and by precious resources. It is widely known that the decrease of population and the abandonment of settlements in mountain areas also lead to a progressive loss of those techniques and expertise that allowed local communities to take care of their territory. This process's clear consequences can be found in the built heritage, subject to abandonment and severe decay, and in the worsening of the hydrogeological instability that drastically had been revealed by the recent disruptive events occurred. However, in these areas, some practices are arising, activated by the local communities. The different kinds of initiatives carried out by local associations and cooperatives regard various functions and services, including different population levels. Even though they have different objectives and are promoted by various actors, all these activities impact the architectural heritage, and it is necessary to outline the effects of these projects on the built heritage.

Keywords: architectural heritage, initiatives for reuse, depopulated mountain villages, local community, Cadore

Located in the very northern part of Belluno province, bordering Trentino Alto Adige, Friuli Venezia Giulia, and Austria, Cadore is a historic region divided in three main areas named Cadore Centrale, Val Bòite, Comelico and Sappada[1]. This territory is entirely composed of mountain municipalities[2], the human settlements are mainly located at the foot of the Dolomites[3]. This territory shows various fragilities from the social, environmental, and economic points of view, which can be often observed in Italy's marginal mountain areas. However, at once, it contains several capacities and resources, mostly related to the community impulse. The first, clearest, weakness is the severe depopulation trend that has become significant starting from the sixties[4]. The population is simultaneously ageing, counting 200 elders (over

[1] Sappada still belongs to "Magnifica Comunità di Cadore", but in 2017 became part of Friuli-Venezia Giul
[2] Classified as "entirely mountain municipalities" according to the legislative decree of August 18, 2000 n. 267.
[3] The Dolomites, part of the Southern Limestone Alps, had been declared a UNESCO World Heritage Site in 2009. dolomitiunesco.info/i-valori-universali.
[4] The population of the northern Belluno province decreased by 18% between 1971 and 2011 (by 5% between 2001

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Fig. 1
Villaggio Eni in Borca di Cadore (1954-1962), architect Edoardo Gellner. Since 2014 it has been involved in the valorization and re-activation program "Progettoborca", by Dolomiti Contemporanee. (Credits G. De Donà).

65 years old) every 100 young people (0-14 years old): this area has the highest old-age index of the province[5]. The physical marginality of these places is often reflected in social marginality, with a reduction of citizenship rights, due to the closing of basic services such as hospitals or schools. Strictly connected to this social fragility, the transmission of knowledge in taking care of the local environmental heritage is hindered by the missed generational turnover, and the ancient know-how is at risk of disappearing. Mountains are nowadays fragile territories that are characterized by unstable slopes; their inhabitants' care is needed to reduce hydrogeological and hydraulic instability that threaten the valleys and the urbanized plains. Cadore has an ancient tradition in the forestry management, the largest part of its territory is nowadays still governed by "Regole", institutions recognized by national and regional laws, founded in the Middle Ages for the collective

and 2011). Between 1991 and 2018, the population decreased by 12,03% in Mountain Union Centro Cadore, by 20,24% in Mountain Union Comelico, by 11,81% in Mountain Union Val Boite, by 20,43% in Mountain Union Cadore, Longaronese, and Zoldo. Belluno Province, 2019

[5] Euris Srl elaboration based on Istat data, 2015

administration of landed properties[6]. In these areas are present large hydric, forestry, ecological, landscape, and cultural resources, that could play a role in the employment and welfare trends, but they are now poorly managed. In addition, the reduction of the Total Agricultural Area and the consequent increase of wooded areas[7] lead to raise the hydrogeological risk. The forest is a living creature, it is affected by the increasing of age and, also, it is exposed to the climate change risks[8]. The lack of maintenance of the forested areas, the related worsening of the hydrogeological instability, and the effects of the climate change had been drastically revealed by the recent disruptive events occurred[9]. For these reasons, the presence and the activities of the local communities are crucial. The negative demographic trend is also closely related to the economic evolvement of the area. Forestry activities had been the core of the local economy until the end of the XIX century, when the eyewear industry has developed and grown[10]. Starting from the late XX century, this manufacturing district saw a progressive crisis, with a decrease of the number of companies and the simultaneous growth of the few, most important, firms[11]. During the last twenty years, in response to a decrease in the number of active units and employees in the industrial and agroforestry sectors, an increase is registered in the "social economy", in which the percentage variation of the number of companies and workers is higher than the Italian average[12]. Despite the various fragilities observed, the local community's diversified social and cultural initiatives are spread on the territory, demonstrating that some dynamics are still standing. Different kinds of initiatives are carried out by local associations and cooperatives that regard various functions or services and include different population levels. All these practices have a direct or indirect impact on the architectural heritage; some of them are focused on preservation and reuse of the remains of the traditional local activities, such as rural buildings or industrial sites now disused. Others have an implication in the built heritage, even if it is not the project's core. Some of these activities are based on cultural and artistic projects linked to the local heritage and landscape, as "Dolomiti Contemporanee", a laboratory born in 2011 that identifies unused spaces, such as abandoned factories and industrial sites, military structures, schools, touristic facilities, and reactivates them through permanent or temporary artistic and cultural

[6] Relevant legislation: L. n. 991 – July 25, 1952, art. 34, L. n. 1102 December 3, 1972, art. 10 e 11, L. n. 94 January 31, 1997 art. 3, L. November 20, 2017, n. 168, L.R. n. August 26 19, 1996. regione.veneto.it/web/economia-e-sviluppo-montano/regole
[7] Euris Srl elaboration based on Istat data, 2015
[8] Andreatta, 2019
[9] It has been revealed not only by the biggest and dramatic event Vaia (October 2018, see Chirici, 2018), but also by the various damages caused by frequent smaller storms (Summer 2020).
[10] The first eyewear industrial production was founded in 1878 by Angelo Frescura, in Calalzo di Cadore. Fabbiani, 1992.
[11] Many factories had been relocated, but the sector is still working in the nearby town of Agordo.
[12] Belluno Province, 2019

Fig. 2
Mural painting in the village of Cibiana di Cadore. (Credits M. Dall'Agnola).

processes[13]. These projects, located not only in Cadore but also in the nearby Agordo, Ampezzo, Longarone, Alpago and Belluno[14], are based on strategic programs with more than 400 public and private partners that constitute the structure for a wider support network[15]. (Fig. 1)

Other initiatives are focused on the valorization of tangible and intangible local heritage. This is the case of "Algudnei", that is not just an ethnographic museum, but a group of associations that work for preserving and sharing knowledge related to Ladin history, traditions, language, and to the evolution of rural architecture structures, especially concerning the Comelico area[16]. This project was activated thanks to the partnership with the community cooperative "Lassù"[17], founded in 2015 by nine local young people, most of them returning in Comelico after completing the studies in the big cities, active in the field of culture and tourism[18]. (Fig. 2)

Fig. 4
Traditional rural building "tabià" in Dosoledo (Comelico Superiore). (photo by C. Valiante, 2020).

[13] Art exhibitions, cultural venues, workshops. See De Rossi, 2018 and dolomiticontemporanee.net
[14] In detail, some of the reactivated abandoned spaces are: a school in Casso, the touristic Eni village in Borca di Cadore, a military fort in Pieve di Cadore, the contemporary landscape in Forni di Sopra, the alpine hut Brigata Cadore in Alpe del Nevegal, a paper factory in Vas, a chemical plant in Sass Muss, Sospirolo, an eyewear factory in Taibon Agordino, the Andraz Castle in Livinallongo del Col di Lana, a mining village in Imperina Valley and others, dolomiticontemporanee.net
[15] The entire project has been awarded the "green flag" by Legambiente – Rapporto Carovana delle Alpi 2020, that recognizes innovative practices and high environmental and cultural quality initiatives in mountain territories. Rapporto Carovana delle Alpi 2020 www.legambiente.it/rapporto-carovana-delle-alpi-bandiere-verdi-e-nere-2020-assegnati-da-legambiente-i-vessilli-sulla-sostenibilita-nellarco-alpino, dolomiticontemporanee.net
[16] "Algudnei" (that in Ladin, the local language, means "something about us") is a museum and a cultural project that contains and spreads the results of researches conducted on the territory of Comelico and the Ladin culture by Cultural Research Group of Comelico Superiore and Regola of Dosoledo. Algudnei.it
[17] "Lassù, alpine places of health, sustainability, of uniqueness", Padovan, 2015
[18] Carrosio, Moro, Zabatino, 2018, p. 451

In Cibiana di Cadore, an initiative promoted in 1980 by the local administration and Vico Calabrò, a painter native of Agordo area, brought several artists from all over the world to paint the history and ancient traditions of the village on the wall of the houses. Every year Cibiana, now known as "the town that paints its history", expands this artistic heritage with new murals, valorizing the village and the local architectures[19]. (Fig. 3)

Moreover, thanks to Alp City, a project financed by the European program for the transnational cooperation Interreg 3B Alpine Space, that promotes the local endogenous development and urban regeneration of small alpine towns, studies have been conducted for promoting the conservation of the local rural heritage, in order to firstly deepen the knowledge of the local constructive tradition and then to promote guidelines for the recovery of peculiar types of alpine buildings. This research explored some study-cases located in Comelico, all related to the "tabià" typology[20], the local barn or stable originally essential for farming activities, defining solutions, methods, and good practices for the restoration of these

[19] De Zordo, 1991, Pra Baldi, 2013
[20] De Diana, De Martin, 2009, Gellner, 1988

Fig. 5
Detail of the external walls of a traditional rural building "tabià" in Dosoledo (Comelico Superiore). (photo by C. Valiante, 2020).

Fig. 6
Traditional rural building "tabià" in Padola (Comelico Superiore). (photo by C. Valiante, 2020).

historic buildings. The final tools obtained, the Guidelines for the recovery and the reuse of the buildings and the Manual of the good constructive practices, were addressed to private technicians and owners, but also to the local public administrations[21]. (Figg. 4-7) Besides these practices more related to the valorization of artistic, cultural, historical, and traditional aspects, have emerged other initiatives also related to the social cohesion of these villages. Cadore Centrale and Comelico, during the last ten years, promoted widespread hospitality for refugees and asylum seekers, thanks to the work of the local community, associations, and cooperatives, intending to facilitate the integration, teaching these new inhabitants activities and jobs strictly related to the territory. The social cooperative "Cadore S.c.S." is actively working for the local community, with the local community. Among its various projects[22], since 2011 the cooperative welcomes asylum-seekers, choosing the model of the widespread hospitality to simplify the integration through small homogeneous groups (3-4 people)[23]. These people, distributed among Perarolo, Domegge, Lozzo, Valle di Cadore and several smaller villages, can live independently in

[21] Ferrario, 2006, Euris, Regione Veneto, Linee guida per il recupero dei tabià: direttive e prescrizioni urbanistiche, Euris, Regione Veneto, Manuale delle Buone Prassi per il recupero dei tabià, 2006
[22], Cadore S.c.S., 152 members, works to create job opportunities and promote the economy of the territory. It deals not only with asylum-seeker hospitality but also with environmental maintenance, naturalistic engineering, global service, community tourism, job placement, cadorescs.com. The cooperative has been awarded by Unhcr (United Nations High Commissioner for Refugees) for its support to the integration of beneficiaries of international protection in the local community.
[23] Legambiente, 2018

vacant houses or unused spaces provided by the cooperative, the local administration or private actors. The process is facilitated by the working involvement of the asylum-seekers, that carry out works that deal with the maintenance of territory (local streets, bicycle paths cleaning, and forestry care), and take part to professional training courses and internships aimed to their employment insertion[24]. Kamara, an asylum-seeker, lives in Vallesina, a village with just 20 inhabitants; he used to be a carpenter in his home country. Thanks to Fabio, the local carpenter, he could resume his job giving his own expertise and learning the local one. In addition, the project "Simbiorti", started in 2016, consists in the experimental cultivation of artichokes, involving ten disabled people and some asylum-seekers: this activity aims to give strong social value to a respectful agricultural practice[25]. This activity reuses and reactivates an abandoned area, close to the ex-Convent of Pieve di Cadore, made available for hosting refugees. (fig. 08) Even though in 2019 the funds for refugees' hospitality have been reduced[26], these initiatives are still taking care of the territory and, on a broader perspective, of the local heritage. This kind of inclusion process can trigger, besides the fruitful integration between different cultures, a new approach to the management, the maintenance, and the care of territorial heritage, which includes environmental, architectural, and cultural heritage[27]. Furthermore, these new economic activities have several impacts on the community. They satisfy the needs of some emerging categories, give voice to new expertise and jobs, and trigger new investors. Cadore, even if highly peripheral, shows lots of different initiatives spread all over the vast, sparsely populated, territory[28]. All these projects have been activated by part of the local community, that although is shrinking, seems willing to valorize the existing and preserve the ancient heritage and traditions.

Besides the experiences triggered by local people, this area is also included in national and European programs, such as the National Strategy of Inner Areas (SNAI) and the Rural Development Plan 2014-2020, with the LEADER approach. A sub-regions of northern Cadore, Comelico[29], is one of the Inner Areas where SNAI operates and already submitted the "*Strategia d'area*", that have been approved in January 2019[30], while the "*Accordo di Programma*

[24] Tempera, 2017
[25] Membretti, Kofler, Viazzo, 2017
[26] Dall'Anese, 2019
[27] Oteri, 2019
[28] Cadore, composed by 22 municipalities, has an overall surface of 1.427 km^2 and 32.179 inhabitants (the density of population is of 23,5 people per square km), dati.istat.it
[29] Inner Area "Comelico-Sappada". At first, the Strategy also involved the municipality of Sappada, which was part of the Veneto Region. Since Sappada joined Friuli Venezia Giulia in 2017, the Strategy now concerns the five municipalities of Comelico, Unione Montana Comelico-Sappada, Strategia d'Area del Comelico "La Valle dello Stare Bene", 2019
[30] Unione Montana Comelico-Sappada, Strategia d'Area del Comelico "La Valle dello Stare Bene", 2019

Fig. 7
Detail of the upper part of a traditional rural building "tabià" in Padola (Comelico Superiore). (photo by C. Valiante, 2020).

Quadro" is currently under subscription[31]. In response to the situation depicted by the analysis of the context and of the ongoing trends, the objective of the Strategy is to tackle the depopulation by focusing on the high environmental quality, enhancing the tourist offer, and the development of new local entrepreneurship that will valorize the peculiar resources of this mountain territory (landscape, environment, wood, agricultural products), strengthening the essential services such as local healthcare, mobility, and educational offer. Even if it had been promoted by the local administrations with the community's participation, this project does not seem to consider the existing practices that are more related to cultural and social aspects. Even if the experiences described previously, activated by local organizations, are mainly focused on the reactivation of abandoned spaces, on the preservation of the local built heritage, and on the social cohesion, the funding programs triggered by national and European initiatives seem centred on different issues. In the Leader approach, the "Gal Alto Bellunese"[32], by which fundings allo-

Fig. 8
Simbiorti project organized by the community cooperative Cadore S.c.S., in Pieve di Cadore. (Credits A.Zurzolo, cooptelling.com).

[31] SNAI, Strategia Nazionale Aree Interne, Stato di avanzamento, aggiornamento 18 maggio 2020, http://old2018.agenziacoesione.gov.it/opencms/export/sites/dps/it/documentazione/Aree_interne/accordi_programma_quadro/APQ_agg._20.5.2020.pdf

[32] Gruppo di Azione Locale Alto Bellunese, Manifestazione di Interesse, Proposta di strategia di sviluppo locale

cated by Rural Development Plan are managed, covers themes similar to Snai Strategy: job and tourist offers, valorization of local environment and landscape. A small part of the Gal strategy is focused on the reuse and reactivation of the built heritage but related to the widening of the tourist hospitality. In the Cadore region, the tourism sector has been quite diffused since the fifties[33] both for winter and summer seasons, but it has never been the main economic activity of this territory. Therefore, it seems that the various projects activated in the territory do not converge, aiming to different objectives.

From the perspective of reactivation of these places, it is necessary to profoundly investigate the territory to understand and take in consideration the effective, and already existing, capacities of the place, that could be not immediately evident, but are daily working thanks to the community impulse. This tracing can reveal to be crucial also to take into account the consequences of these experiences on architectural heritage. The preservation of architectural heritage is one of the main topics faced by local experiences that approached the themes of rural heritage, industrial archeology, abandoned spaces. Cadore's area is characterized by peculiar widespread architectural and cultural heritage, which is the trace of

"Leader" 2014-2020, Regione Veneto, 2015

[33] Tourists were attracted by the mountain landscape since the XIX century, but in 1956 the Winter Olympics Games were played in Cortina d'Ampezzo, and from that event also some parts of the Cadore region had been affected by tourist flows. G. Fabbiani, Breve storia del Cadore, Magnifica Comunità di Cadore Editrice, 1992

ancient and recent historical traditions, uses, and economic activities. Since the social and economic organization of this area is deeply changed, the built heritage results to be at risk for two main, opposite, reasons: the abandonment and the complete lack of maintenance or conservation due to the depopulation trend, and, on the other side, careless transformations, or demolition, in order to provide an attractive tourist offer that addresses today's comfort needs[34]. National and European programs represent an excellent resource for peripheral territories, but they need to investigate the ongoing dynamics to empower them. It would be useful to provide support to local administrations also to check the implementing procedures, avoiding negative consequences on the existing heritage. Reading the experiences activated by the community allows to understand the spontaneous trends that can be useful to be studied, also in order to share and promote practices already applied. Therefore, it appears essential to investigate the dynamics already in place for the reactivation of these villages to integrate the existing initiatives with funding policies at the local or national level and monitor their influence on the built heritage.

[34] Ferrario, 2006, Gellner, 1988

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ARCHIPELAGO CAMPANIA.
ABANDONED VILLAGES, CONSERVATION STRATEGIES, AND POST-PANDEMIC TOURISM

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The juxtaposition between the ruins and the reconstructions of Old Aquilonia in a view of the "archaeological" park of Carbonara. Credit: E. Vitagliano, 2020.

Over the last 30 years, worldwide explosion in tourism has triggered destructive consequences for the cultural heritage, with the opposite extremes represented by the abandonment of disregarded ruins and the heavy wear of the busiest sites. With the 2020 pandemic crisis, the common practice of visiting during summer crowded attractions or coastal areas has collided with anti-contagion guidelines, compelling the tourism sector to reinvent objectives and solutions of its supply. This challenge in Italy has prompted the rise of "staycation" and "undertourism" models, which provide visitors with experiential activities in the rural context of internal areas, according to safety requirements and demand for entertainment.

The paper examines the offers of post-pandemic tourism from the perspective of abandoned villages in Campania (Italy), illustrating conservation projects, requalification operations and initiatives tackled and completed for the redevelopment of the inner areas. The system designed as "Archipelago Campania" could decongest and depolarize the most coveted tourist destinations, contributing to the debate on safe tourism and revaluation of "ghost towns".

From being a decay factor, the abandonment becomes the main thrust behind development, activating a process in which slow tourism brings sustainability and economy together, ensuring safe travels, conservation of built heritage, and economic renewal.

Keywords: post-pandemic tourism, innovative fruition, slow tourism

Introduction

The growth in leisure time, sponsorship of events and availability of cheap travel have caused a worldwide explosion in tourism over the last 30 years, with destructive consequences for cultural heritage, with the opposite extremes represented by the abandonment of disregarded ruins and the heavy wear of the busiest sites. Moreover, due to the 2020 pandemic crisis, visiting crowded sightseeing attractions or coastal areas has become a risk factor for human health. Therefore, a discussion about innovative ways of fruition —safe for people and sustainable for historic sites— has been ongoing.

During the atypical COVID-19 summer, Italian tourism has focused on "staycation"[1], providing alternative forms of vacation, according to safety requirements and demand for

[1] The definition in the Collins dictionary: «*A staycation is a holiday that you spend in your own home or your own country, relaxing and enjoying leisure activities there.*»

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Internal view of the Church of San Michele Arcangelo (San Pietro Infine), restored in 2016. Credit: E. Vitagliano, 2020.

View of Auletta with Parco a ruderi in the foreground. Credit: A. Iuorio, 2020.

Ruins of San Pietro Infine. Credit: E. Vitagliano, 2020.

entertainment. Abandoned "hilltowns" with slow rhythms, quiet paths, picturesque perspectives, and opportunity for experiential activities, have managed, in many virtuous cases, to satisfy local inhabitants' and holidaymakers' needs, while at the same time improving the conservation status of sites.

The paper aims at illustrating conservation projects, requalification operations and initiatives undertaken and completed in Campania (Italy) to redevelop historic abandoned towns in the inner areas in order to decongest and depolarize the most coveted tourist destinations. All these small experiences are the "isles", the points of reference, in the large territory of the inner areas. Together, they form the "**Archipelago Campania**", a system of architectures and environments associated with "choral" values[2] that could engage a process of sustainable economic and cultural reactivation.

Strategies for enhancing abandoned villages in campania: between conservation and tourism

The connotation of smaller urban centres as cultural heritage triggers the circular process of awareness on abandoned hamlets, of which enhancement and conservation are the designated goals. Therefore, the compatibility of uses stems from the recognition of

[2] Roberto Pane highlighted the symbiosis of vernacular architecture and natural context, coining the evoking expression "choral value". See e.g.: R. Pane, *Architettura rurale campana*, Rinascimento del libro, Firenze, 1936.

The "square-theatre", a space in the historical core of Cairano that has been turned into a location for events. Credit: E. Vitagliano, 2020.

values and potentials of "Italian hilltowns"[3], without overlooking uniqueness of individual cases.

Naturalistic vocations and picturesque suggestions often flatten the design choices and reduce a village, with its history, shapes, structure and materials, to simple ruins, free from spatial and temporal connotations. The abandonment realizes settings for events that characterize villages, but deprive them of their own identity. However, other cases address the issue of conservation with a more comprehensive and unitary vision, including implementation of the landscape and development of museums, parks, *alberghi diffusi*[4] and polycentric urban systems.

Plan of the albergo diffuso in Castelvetere (https://www.verderosa.it/, access 24.09.20).

The painful reason of abandonment as the project theme

In many cases, the reasons for the abandonment have been the main driving force in the choice of projects. The latter tell stories of wounds inflicted on villages, seen as single architectural complexes, now museums of themselves.

[3] In 1964, the architect Bernard Rudofsky brought to the attention of Americans the abandoned villages of Italy. The "Italian hill towns", inhabited by "anachronistic communities", are mentioned among the examples of vernacular architecture he defined "nonpedigreed". (B. Rudofsky, *Architecture without Architects. A Short Introduction to Non-pedigreed Architecture*, Connecticut Printers Inc., Hartford, 1964, p.44)

[4] The *Albergo diffuso* is a model of touristic development of territory; it translates literally as "scattered hotel" and is a form of widespread hospitality in which accommodations are authentic and local rooms scattered throughout different buildings within the town.

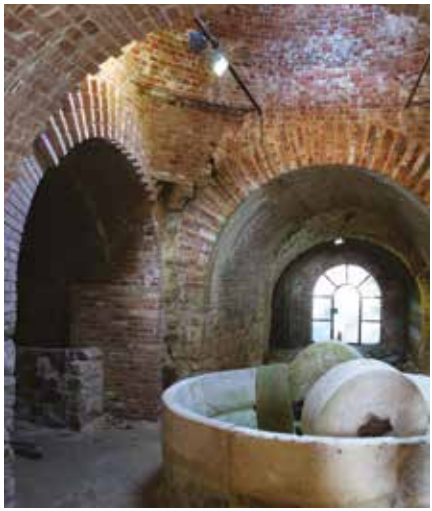
These dead monuments are often preserved **in form of ruins.** An additional challenge to the usual maintenance and functional choices of a urban scale museum is therefore given by the issues of strong integration with the landscape and accessibility. Villages following this model form **thematic networks,** which embed the village vicissitudes into the history of neighboring territories.

One of them, the "Park of the Historical Memory", makes use of the **San Pietro Infine** ruins as a document to narrate the Second World War[5]. This village, sited on the Gustav line[6], suffered a shelling in December 1943[7], forcing inhabitants to move downhill, first to caves, and then to the new town. Only in the 1990s, thanks to an initiative of local citizens, San Pietro Infine became an object of excavation and removal of debris to turn ruins into an **open-air museum**. Moreover, municipal authorities have developed policies of protection and conservation. The consequences of these policies range from the realization of a Visitors Centre

[5] The historical memory park of San Pietro Infine is recognized as National Monument with the Legislative Decree of 18th March 2008.

[6] The Gustav line was a series of defensive fortifications in Italy constructed during the WWII by Organisation Todt. Arranged by Hitler, the Gustav line extended from Ortona, south of Pescara, to the mouth of the river Garigliano, between Lazio and Campania, and divided Italy in two areas of influence, the north occupied by German and fascist troops, the south in the Allied hands.
The Gustav line has recently been included among the tours of "Europe Remember 1944-1945", the project realized by the Liberation Route Europe Foundation with the aim of coordinating, simplifying and organizing an international awareness campaign and developing commemoration tourism to reflect on the WWII.

[7] John Huston has filmed the WWII event in the documentary *The Battle of San Pietro*. https://www.youtube.com/watch?v=3OLJZvgIx5w&ab_channel=USNationalArchives (access 24.09.2020)



A glimpse of Castelvetere after restoration (https://www.verderosa.it/, access 24.09.20).

A vault added in the 1985 interventions by the Superintendence of Avellino and Salerno (Calitri). Credit: E. Vitagliano, 2020.

A tower in Borgo Castello (Calitri). Credit: E. Vitagliano, 2020.

Museum, which prepares tourists to a conscious experience of the historical and memorial site, to conservative solutions, which preserve village authenticity. One important guideline has been the respect towards all historical phases, and the conservation of the buildings representing them. For example, even the —arguably questionable— post-conflict reconstruction in concrete of the Church of San Michele Arcangelo has been left recognizable, as it documents the works carried out thanks to the Allied funding[8] and the endorsement of the Italian 1940s political guideline[9].

Besides traumas of anthropic origin, painful reasons for the abandonment could be consequences of natural phenomena: the earthquakes shaped most of the ghost towns in Campania, a high seismic risk territory.

In **Auletta**, the *Parco a ruderi*, displayed at the past Biennale[10], remembers the shocks of 1980 with an urban theme park. It occupies one quarter of the historical centre through

[8] About post-war interventions on the Church of San Michele Arcangelo: A. Spinosa, G. Vitagliano, *Restauri con l'uso del cemento armato: problematiche di conservazione. Il caso della chiesa di San Michele Arcangelo a San Pietro Infine*, in R. Ientile, (ed.), *Architetture in cemento armato: Orientamenti per la conservazione*, Franco Angeli, Milano, 2008, pp.512-518. About the 2016 restoration of the Church: R. Borrelli, O. Masia, *Chiesa di San Michele Arcangelo. Valore restituito nel Parco della Memoria Storica di San Pietro Infine*, Vagnoni Grafiche srl, Roma, 2017.

[9] In 1940s, the Italian political landscape was dominated by Christian-socials, as can be seen by the predominance of Christian Democracy (DC) in the elections of 1948. About the relation between politics and reconstruction: G. Vitagliano, *La conservazione dei monumenti tra ricostruzione materiale e ricostruzione morale nella Campania settentrionale del dopoguerra (1943-1955)*. In S. *Casiello, Offese di guerra. Ricostruzione e restauro nel Mezzogiorno d'Italia*, Alinea editrice, Firenze, 2011, pp.143-153.

[10] *Parco a ruderi* has been displayed at the 16th International Architecture Exhibition La Biennale di Venezia, whose topic was "freespace". Besides being in the Italian pavilion, the project in Auletta was the protagonist, with other four villages affected by earthquakes, of the collateral event *Borghi of Italy* – #No(F)Earthquake.

View of Old Conza with the archaeological park of Compsa. Credit: S. Cassese, 2019.

conservation and partial reuse of the abandoned village. The *Parco a ruderi* develops two projects. One of them is the conservation of this urban "**decentralized museum**", and the other one is an artistic program that keeps track of the shock and the life before it[11]. The authenticity of places and materials is respected, from the conservation of wallpapers to the care of the irregular shapes of wall ridges. The ongoing project will include operations of safety enhancement and musealization of the abandoned hamlet, where a path, unpicking the building tissue, overcomes the formal and factual barriers between public and private spaces: over one hundred rooms become a single monument, interacting with the landscape. The aim is to realize a park for local culture with a network of touristic services[12], embedded in a cultural tour, which includes the grottoes of Pertosa-Auletta and MIDa museums.

The experience of Auletta comes from professional projects, which are mostly produced for contests, with the purpose of a **multi-scale shared planning**. However, in the earthquake areas of Campania, municipal authorities have realized other models of conservation.

[11] About *Parco a ruderi*: Catalogue of the Collateral Event of 16th International Architecture Exhibition La Biennale di Venezia, *Borghi of Italy* – #No(F)Earthquake, Concilio Europeo dell'arte, Venezia, 2018.
[12] The forms of widespread hospitality are described by Giancarlo dall'Ara, the president of ADI (national association of Alberghi Diffusi) (https://www.slideshare.net/dallara/what-is-an-albergo-diffuso, access 24.09.2020)

The "archaeological" park of **Carbonara**[13] hands back to Aquilonia the memories of the village, abandoned because of the 1930 earthquake. This has been realized with a reconstruction of the architectural ruins left in site after its use as a cave for the new and safer hilltown[14]. The Park, including a medieval core that connects the Madre Church to the municipal square, resembles a theatrical backdrop. Nevertheless, ruins are treated as building material for a village, which never existed, where authentic architectural elements are moved to arbitrary locations, without following the adherence of details and philological accuracy[15].

The void left by the abandonment as a place for experimentation

The abandonment produces a void that can also be turned into a **place for experimentation**. Here, educational activities, workshops, and summer schools are carried out, focused on the needs of case studies, or designed for learning-by-doing bio-architecture lectures.

Academic laboratories and scientific collaborations on **Apice Vecchia** and **Tocco Caudio**[16] study the vulnerable heritage characterized by their gargantuan size, high risk of collapses, complex hydrogeological conditions and advanced state of material decay[17]. These characteristics make abandoned places perfect case studies to deepen the knowledge of historical construction techniques, urban forms, vulnerability factors, problems of architectural survey, and functional challenges. Agreements between the municipality of Tocco Caudio and the University of Naples "Federico II" focus on the abandoned centre, envisioning a study of the ruins, which involves an integrated process of didactics and applied research[18]. Concerning Apice Vecchia, studies in various disciplines have been developed since 2005, when the IUAV[19] presented a proposal for the reuse of the town as a "Village-Museum of post-war dai-

[13] The Municipality of Aquilonia has carried out the intervention as a part of POR Campania 2000-2006, Misura 2.1.
[14] The monument to the fallen of the First World War was built with stones from the sixteenth-century church of the ancient centre (G. Chierici, *I monumenti dell'alta Irpinia ed il terremoto del 1930*, Tipografia Pergola, Avellino, 1932, p.8)
[15] V. Coppola, *Aquilonia - Parco archeologico di Carbonara*, in ID, *Ricordarsi un futuro. Società locale e partecipazione allo sviluppo in Alta Irpinia*, PhD thesis in Sociology of cultural phenomena and regulatory processes. University of Urbino "Carlo Bo", 2015, pp. 203-208; R. Amore, K. Fabbricatti, *Earthquakes, abandonment, regeneration in Italian inner peripheries. The case of Aquilonia in the campano Apennines/ Terremoti, abbandono, rigenerazione nelle aree interne italiane. Il caso di Aquilonia nell'Appennino Campano*. In P. Fiore, E. D'Andria (eds.), *I centri minori…da problema a risorsa | Small towns…from problem to resource*, Franco Angeli, Milano, 2019, pp. 41-51.
[16] Promoted respectively by IUAV , University of Ferrara, University of Sannio, University of Salerno and, for Tocco Caudio by the University of Naples Federico II.
[17] The cases mentioned are examples of abandoned towns in which academic research has played a central role in reopening the debate on the future of villages. In Campania, however, Universities study other towns which we do not discuss in this paper.
[18] V. Russo, *Historical ghost town: Sustainable conservation in Southern Italy*. In C. Mileto, F. Vegas, L. García Soriano, Cristini, V., *Vernacular Architecture: Towards a Sustainable Future*, CRC Press, Leiden, 2014, pp.655-660. L. Romano, *Tocco Caudio. Tecniche costruttive storiche e fattori di vulnerabilità strutturale di un borgo nel Sannio beneventano*, in R. Picone, V. Russo, (ed.), *Construction art in Campania between restoration and structural safety*, Clean Edizioni, Napoli, 2018, pp. 273-278.
[19] In 2005, IUAV has proposed the project of "Una Pompei del '900 in provincia di Benevento" and then other

ly life in the Italian province", which has not been realized. From 2012, Apice has witnessed the slow reopening of activities, triggered by a feasibility study of the Project Financing for the urban regeneration of the historical centre. Academic researches, the restoration of Ettore Castle, and private local initiatives —that are a response to municipal tenders— are relevant driving forces of the still ongoing model of Apice Vecchia.
Characterized by a less history-based approach, the experimentation in **Cairano** transforms the depopulation in an occasion to realize sustainable architecture. In the streets and historical buildings of the "B*orgo biologico*" —an "organic hamlet"— technology plays a main role, converting the traditional village into a bioclimatic architectural system, able to spark the interest of students[20] and tourists. The use of local materials in the *Borgo biologico*, such as irpinian stones —especially the ones fallen during the earthquake— and Calitri wood, simplifies transports and allows for the involvement of the local workforce. Modern renewals relate to the local landscape and history, as they are characterized by the use of **traditional and contemporary skills**, as well as of 4000 square meters of services and residential spaces[21]. The ruins from the 1980 earthquake, equipped with new anti-seismic and energy saving technology, become hotel accommodations, especially suitable for artists in residence[22].

Urban acupunture model

The deserted spaces could also become opportunities for **strategic action of urban acupuncture**, focused on the conservation of significant historical buildings, or on the realization of *alberghi diffusi*, widespread accommodations in the territory with unity of project.
The virtuous experiences of Castelvetere sul Calore, Quaglietta, Volturara Irpina and Taurasi are examples of preserving through actions on different urban areas, and form a single rehabilitation program of villages belonging to the *Comunità montana* Terminio-Cervialto[23]. The case of the *albergo diffuso* in **Castelvetere** represents the meth-

Universities have worked on Apice. University of Salerno has inserted Apice in the project "Ancient Appia Landscapes", and the University of Ferrara has contributed to draft of the 2010 feasibility study.
[20] For example, in 2018 students of the II level Master, of roman University LUMSA, CasaClima-Bioarchitettura, have taken part in the event *Residenza Borgo Biologico* visiting restoration works in Cairano.
[21] A. Verderosa, *The organic hamlet, integrated renewal*. In supplement to DOMUS n.1025, 2018, pp.120-121.
[22] Franco Dragone, theatre director known especially for his work with Cirque du Soleil, selected Cairano as the seat of a Masterclass in Performing Arts.
[23] In 1996, a consortium of Municipalities belonging to the *Comunità Montana* "Terminio–Cervialto" issued a tender for the rehabilitation of four villages, damaged by 1980 earthquake, through a project of enhancement of historical centres. The aims range from the restoration of housing units to the setup of alleys and public spaces. The project, financed by EU funds, experienced operations of integrated conservation simultaneously in several sites, with a single design team and Contracting Authority.

odology applied through the whole project, with its use of local materials, techniques, and workforce, as well as an attention to seismic issues[24]. In the rooms, heated by wood burning stoves, the conservation of the materials (and of the atmosphere) offer tourists a stay in memory of the ancient rural times of the Italian province.[25]

In **Morigerati**, the model of urban acupuncture is realized in the project of *Paese albergo*, which offers hospitality in private homes, with an info point and a reception. Using pre-existing restored buildings as rooms and urban or natural places as common areas, Morigerati, with its hamlet of Sicilì, extends its perimeters of *Paese albergo* and becomes a *Paese ambiente*[26].

Environmental tourism

Sometimes, the depopulation of villages is put through a larger scale abandonment, so initiatives aim to realize a unified system of attractions in memory of **ancient viability** and connections: the outcomes of this approach are represented by investments in **slow tourism** and enhancement of railways and mule trails.

This formula of environmental tourism leads to shared strategies of diffused enhancement, where networks of villages and landscapes promote **territorially-scale restoration**, starting from natural and anthropic nodes.

The nineteenth-century **railroad of Avellino-Rocchetta**, restarted in the occasion of Sponz fest 2017[27], was the first infrastructure —before motorways and high-speed roads— to overcome isolation of internal areas[28].

The revaluation of this ancient railroad, recognized as a work of cultural interest[29], improves the touristic offer of Irpinia and generates a territorial system, already rich of cultural centres.

[24] The seismic improvements included consolidating injections, reconstruction of the platbands and of the top curbs, chestnut wooden floors with steel tie rods and anchors rods.

[25] The description of the project is on the site of the author https://www.verderosa.it/portfolio_page/borgo-di-castelvetere/. The work of Verderosa has resulted in the volume: A. Verderosa, (ed.), *Il recupero dell'architettura del paesaggio in Irpinia. Manuale delle tecniche di intervento*, De Angelis Editore, Avellino, 2005.

[26] https://www.morigeratipaeseambiente.it/morigerati-paese-ambiente/morigerati-paese-ambiente.asp (access 24.09.2020)

[27] Sponz fest is the cultural festival created and directed by Vinicio Capossela. The 5th edition 2017, titled "*All'incontre'Я – Яivoluzioni e mondi al Яovescio*, included in the schedule of the event the appointment "Sponz Fest Express!", a train journey on the railroad of Avellino-Rocchetta. Moreover, in 2014 the concert-event of Capossela was set in the station of Conza-Andretta-Cairano. About the railroad of Avellino-Rocchetta, S. Casiello, A. Pane, V. Russo, E. Vassallo, *Restoring and reconstructing masonry bridges: researches in Campania (Italy)*, in P. B. Lourenço, D. V. Oliveira, A. Portela, (ed.), *ARCH'07, Proceedings of 5th International Conference on Arch Bridges (Madeira, Portugal, 12-14 September 2007)*, University of Minho, Guimarães (Portugal) 2007, pp. 121-128. A. Pane, *Alle origini dell'ingegneria ferroviaria in Campania: la costruzione della linea Avellino-Ponte S. Venere (1888-1895) e gli attuali problemi di conservazione*, in S. D'Agostino, (ed.), *Storia dell'Ingegneria, Proceedings of 2nd National Conference (Napoli, 7-8-9 aprile 2008)*, Cuzzolin editore, Napoli 2008, II vol., pp. 1291-1300.

[28] T. Morano, *La modifica del territorio e degli assetti urbani in Irpinia. L'influenza della Via Appia e del sistema stradale fino all'età contemporanea*, De Angelis, Avellino, 2003, p.89.

[29] By MiBACT, art. 10 comma 3 letter D, D. Lgs 42/2004.

Two of them are the abandoned hamlets of towns of Ofanto[30], Calitri and Conza della Campania.

The historical "ghost" centre of Borgo Castello, that oversees the populated houses of **Calitri**, includes the medieval ruins of Norman and Angevin fortifications, pertinent to the roman *Castrum*, and the sixteenth-century *palatium*, therefore offering a rich historical evidence respected by the superintendence restoration[31]. However, the most recent works, which focused on highlighting the shapes of buildings, have improved the readability of pre-existences, but at the cost of adding wall portions of accomplishment in *opus listatum*.

On the other hand, the abandoned **Conza**, historically portrayed in form of ruins[32], coexists with the archaeological park of *Compsa*. Surviving stones of the village, that struggled the 1694 "frightening scourge"[33] and other earthquakes of significant intensity, symbolize the traces of a perished civilization. The latter are hardly identified: some ancient elements are located in new-build walls in limestone and bricks[34], and new low walls line renovated floors[35].

Old Conza dominates on a wooded area, surrounded by the modern inhabited city centre, the station of Conza-Andretta-Cairano, and the Conza Lake —a WWF oasis. These elements can create an eclectic supply of slow tourism.

Finally, in the case of **Roscigno**, the abandoned town, interfacing to the charming rural landscape, offers trekking experiences, merging slow walk into the nature to visits to architectural artefacts.

Conclusion

The experiences of "**Archipelago Campania**" to revive the economy of internal and rural areas have been increasingly focused on abandoned villages, through cultural and tourist initiatives. The reactivation process of the ghost towns in Campania acts on the three fronts of **tourism**, **conservation** and **re-appropriation of identity**.

[30] The project "Città dell'Ofanto" is based on the construction of a common vision of strategies for the development and the regional planning of Andretta, Cairano, Calitri, Conza della Campania, Sant'Andrea di Conza, Lioni e Teora. https://www.comune.calitri.av.it/wp-content/uploads/2018/10/1_PUC_RELAZIONE.pdf (access 24.09.2020)

[31] The restoration of Borgo Castello is carried out thanks to ordinary and extraordinary funds of MiBACT and funds of POR Campania 2000/2006.

[32] In the Pacichelli's view of Conza, contained in ID., *Il Regno di Napoli in prospettiva*, Stamperia D. A. Parrino, Napoli, 1703, the village appears ruined by the 1694 earthquake.

[33] G. B. Pacichelli, *Lettere familiari, istoriche ed erudite, II*, Napoli, 1695, p.355.

[34] An example is the portal of the Cathedral of St. Maria Assunta.

[35] T. Colletta, *La conservazione dei centri storici minori abbandonati. Il caso della Campania*, PhD thesis in Conservation of Architectural Heritage, University of Naples "Federico II", 2005, p. 248. (T. Colletta, *I centri storici minori abbandonati della Campania. Conservazione, recupero e valorizzazione*, Edizioni Scientifiche Italiane, Napoli, 2010)

The huge tourist offer allows for a distribution of users over the territory, and the urban scale of single villages guarantees the respect of social distances. Furthermore, the often chosen preservation in form of ruins creates **open-air museums** that respect anti-COVID recommendations of frequenting outdoor places. In other cases, the villages welcome tourists in pre-existing buildings, making guests closer to the rural life. Moreover, they offer long distance workers a chance to live closer to nature, and to expatriates the possibility to come back, thanks to smart working.

The reuse of abandoned villages benefits the conservation, thanks to investments and aware architectural projects; nevertheless, in other cases, shortcomings in the philological method, lack of best practices, and prevalence of utilitarian objectives generate ineffective or even destructive consequences for the historical material and the cultural heritage. **Reconstructions**, the **use of authentic fragments** as tiles of new urban mosaics, **rough rebuilding of paths and squares**, are interventions meant to make accessible and attractive a place, despite the complexity of its painful history. On the other hand, preserving the as-it-was authenticity leads to radical positions that confuse **conservation in form of ruins** with **abandonment**, ignoring the value of maintenance and consolidation project.

The "**Archipelago Campania**", even with its contradictions, provides innovative and safe ways to visit and know cultural sites proving the abandonment could be a restart, in terms of slow, sustainable, and cultural tourism.

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ricerche | architettura, pianificazione, paesaggio, design

sous la direction de
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Villages et quartiers à risque d'abandon

Stratégies pour la connaissance, la valorisation et la restauration

TOME 3

Firenze University Press
2022

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Tunisie, village berbère de Zriba el-Alia (© L. Hadda)

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Cultures pour la conservation et la valorisation du patrimoine à risque d'abandon en Europe

Best practices - guidelines

Materials - decay - analysis

Point cloud – plans, sections - orthophoto, 3D models

Conservation project

RESILIENT TECHNIQUES AND METHODS TO SUPPORT A RESILIENT LIFECYCLE OF VILLAGES AND NEIGHBORHOODS

Fabrizio Ivan Apollonio, Marco Gaiani, Simona Tondelli
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"Laboratory of Places – Ghesc and surroundings – History, survey, evolution" – On field activities: topographic network, laser scanner acquisitions, close range and UAV photogrammetric survey, material recognition, decay analysis, sample collections.

The paper focuses on planning and Heritage lifecycle documentation and management as main activities to support the sustainable planning of villages and neighborhoods and to improve their resilience.
With examples from the last twenty years of progresses, we will seek lessons to better use the next wave of 3D innovation that is coming, to overcome the current critical moment linked to the COVID19 pandemic, to develop resilient systems and techniques able to support the next generation of visual information tools from reality capture (3D scanning, photogrammetry and more) to reality computing (3D modeling and data management), and reality creation (VR, AR & 3D printing).
Focus is on villages and neighborhoods as part of the so-called 'Widespread Built Cultural Heritage' (WBCH) which constitutes a large part of European and Mediterranean Built Heritage and bears great cultural and economic interest.
A discussion on the regeneration of Rural Landscapes through Cultural and Natural Heritage was premised, letting notice that if, on the one hand, the COVID-19 pandemic has threatened rural areas, posing challenges, on the other hand it has shown the potential for a 'rural renaissance', where rural areas would assume a central role in developing sustainable and resilient communities.

Keywords: Widespread Built Cultural Heritage, rural areas, Heritage lifecycle documentation, Heritage lifecycle management, reality capture, reality computing, reality creation

Introduction

Villages and neighborhoods are part of the so-called 'Widespread Built Cultural Heritage' (WBCH) which constitutes a large part of European and Mediterranean Built Heritage and bears great cultural and economic interest. They currently play, unfortunately, a marginal role as argued by many authors in recent years, and major magazines surveyed the problem as in a recent impressive article by CNN style magazine (Marchetti, 2020).
From our point of view, there are three reasons for this loss and degradation of WBCH.
The first cause lies in the lack of a 'guiding information system' that would allow cultural institutions, local cultural policies, and cultural tourism to rise to levels that are proportional to and indicative of the quality and quantity of the assets present in the managed areas. Such a system would allow the replacement of 'ad hoc' funding policies for conservation and exploitation with a mechanism based on small and micro interventions fulfilled by multiple

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

RURITAGE paradigm for heritage-led rural regeneration: the six Systemic Innovation Areas.

and complementary resources and based on the participatory involvement of all citizens.
The second reason is that widespread cultural assets represent a type of Heritage in which ICT-based technological innovation has not yet made substantial advantages in this context but remains desirable with regard to the management and use of those assets.
Nonetheless, 'smart' interaction with this widespread Heritage is very limited because of the user's lack of specific cognitive capabilities (of perception, comprehension, and use) that would allow him/her to easily establish a connection to the relative asset, of which the main property is that it is 3D.
Therefore, we need to guarantee conservation, visibility, and accessibility of these assets both physically and intellectually.
Moreover, villages and neighborhoods represent an extremely valuable strategic complement to the traditional cultural and touristic circuits in the cities of art. In addition to this, we must add the impact that the current COVID-19 pandemic has had on our lives and on the use of CH too. "Italy's remote villages now make an ideal escape" titled a recent article of on-line magazine of "The Guardian" underlining that "the country's historic but often half-empty villages are emerging from the shadows" (Imam, 2020).
This process represents a huge opportunity but could also lead to an unplanned gentrification issue. Secondly, the existing Heritage risks of disappearing or to be engulfed by too fast development. In practice, the greatest quality of these sites is likely to be damaged: their resilience.
How to minimize COVID-19 and the actual social decay and progressive abandonment effects on resilience?
Surely a key point is to carefully plan and manage the process, but also innovative actions able to improve the resilience are needed. Between those, Heritage-led new types of actions are required, besides more traditional activities, as the restoration of historical buildings.
Moreover, how support Heritage-led regeneration innovative plans in the digital era?
Despite huge technological progress, the human challenges of what, how and why we document, manage, and view, have not still disappeared. A new generation of developers and users is improving our everyday tools but is also repeating many early missteps.
In this paper, we focus on planning and Heritage lifecycle documentation and management as main activities to support the sustainable planning of villages and neighborhoods and to improve their resilience.
With examples from the last twenty years of progresses, we will seek lessons to better using the next wave of 3D innovation that is coming, to overcome the current critical moment linked to the COVID19 pandemic, to develop resilient systems and techniques

able to support the next generation of visual information tools taking in account that from reality capture (3D scanning, photogrammetry and more), to reality computing (3D modeling and data management), and reality creation (VR, AR & 3D printing), our digital heritage world is still a far cry less real than that which it seeks to document.

Regenerating Rural Landscapes through Cultural and Natural Heritage

EU territory is covered for the 44% by predominantly rural regions (EUROSTAT, 2018), to which a further 44% of intermediate regions is added, while urban areas represent only the 12% (DG AGRI, 2018a). The 45% of EU population lives in predominantly urban regions, while over the half of the EU-28 inhabitants lives in intermediate regions (36%) and predominantly rural regions (19%) (ibid.). Nevertheless, most rural areas suffer from economic problems, with these areas counting only for the 13% of the GDP of EU-28, as opposite to the 56% of GDP which is produced in urban areas (DG AGRI, 2018b). Therefore, rural areas are characterized by continuous demographic and socio-economic challenges giving raise to increasing depopulation, ageing, disengagement, reduced service provision and inhibited accessibility, and, at the same time, their rich Cultural and Natural Heritage (CNH) is threatened.

This condition can be overturned by demonstrating the tangible and intangible heritage potential for the sustainable growth of rural communities. Indeed, the recognition of rural areas as 'poles of excellence' in heritage capitalization could counter long-standing urban-rural unbalances and acknowledge Europe as world-leader in promoting the innovative use of heritage for rural regeneration.

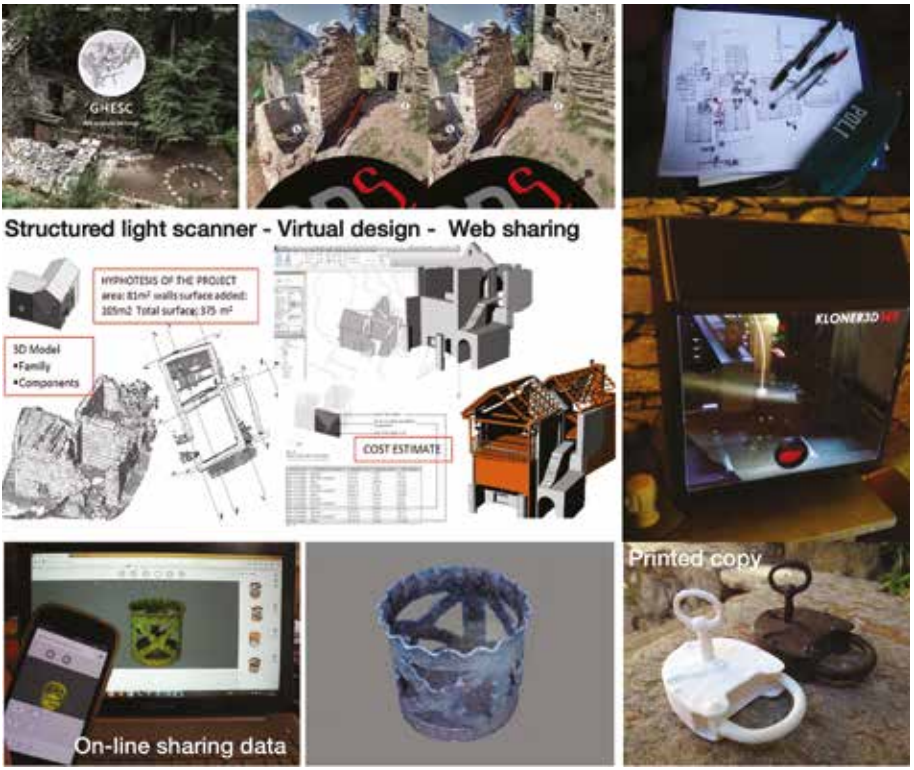
RURITAGE H2020 project aims at demonstrating that rural areas can be transformed into sustainable development demonstration 'laboratories' through the enhancement of their unique Cultural and Natural Heritage potential. The proposed paradigm for regenerating rural communities lies on the identification of six powerful drivers that boos regeneration

Appignano del Tronto RHH.

"Laboratory of Places – Ghesc and surroundings – History, survey, evolution" - Data elaboration in teamwork, constantly face to face: structuring collected survey information, 3D hypothesis, virtual design, digital copy, printed copy, on-line visualization, on-line sharing data.

in rural communities all around the world, the so-called RURITAGE Systemic Innovation Areas (SIAs), and namely Pilgrimage, Local Food Production, Art and festival, Landscape Management, Migration and Resilience.

If, on the one hand, the COVID-19 pandemic has threatened rural areas, posing challenges exacerbated by low available financial resources, not easily accessible health services and greater isolation issues, on the other hand it has also shown the potential for a 'rural renaissance', where rural areas would assume a central role in developing



sustainable and resilient communities. Indeed, rural areas have started to be safe shelters compared to urban agglomerations. Social distancing, the lack of adequate open public green areas and the possibility of remote working could drive people living in densely populated settlements to look for moving to more natural environments (De Luca et al, 2020).
This perception could lead to big opportunities for repopulating ageing rural areas, and to make rural areas attractive poles of development by enhancing the role of CNH for building resilience against the threats of climate change, natural disasters, and social and economic crisis, simultaneously boosting economic growth, creating jobs and livelihoods, strengthening access to health and education, and contributing to foster the responsible ownership of cultural and natural heritage.
For achieving the goal of revitalizing rural areas, opening new possibilities for counterbalancing depopulation and ageing, CNH should be exploited as an opportunity to promote rural areas as multifunctional places beyond the traditional agricultural-related activities. Heritage

"Laboratory of Places – Ghesc and surroundings – History, survey, evolution" - Public discussion and data elaboration in Ghesc, discovery Ossola territory, discover places and traditional architecture and habits.

should hence be acknowledged in its wider sense, including both intangible forms of traditions, social practices, knowledge, and tangible monuments, landscapes and minor heritage, i.e. CH assets that are left aside from large official heritage programs.

For a regeneration process to take place, tangible and intangible features must be combined, by linking together historical or significant buildings with social and cultural practices and new activities.

For bringing back life in rural areas, new functions can be hosted in old buildings and public spaces. For example, a former school can be renovated to host training courses and other activities, like in Izmir in Gediz-Bakircay Basins (TK) or the restoration of a former nursery school damaged by the earthquake allow to host an auditorium and the RURITAGE "Rural Heritage Hub (RHH)", which is both a physical space and a community of local stakeholders (research institutions, policy levels representatives, industrial partners and citizens) that co-develop and co-implement its own path to rural regeneration, like in Appignano del Tronto (IT).

In the case of the Camino de Santiago, RURITAGE Rural Heritage Hub is in monastery of San Zoilo in Carrión de los Condes (EN). It was built in 948 and has hosted a mixture of culture for a millennium. Today the old monastery has the function of a hotel, which can host more than 300 visitors and of hub for the community to discuss about its future opportunities of regeneration.

Moreover, the availability of many un(der)used buildings is an opportunity for new functions through the diffuse adaptive reuse of the built asset; this opens to the possibility to repopulate those territories that have lost their inhabitants and that therefore already offer many opportunities to host newcomers, i.e., by renting or selling second houses underutilized, thus revalorize the already existing built capital. Cultural tourism also could benefit from the availability of those buildings, that could increase the capacity of locals for more touristic offers, both boosting this economic sector the model of the 'dispersed Hotel' and offering cultural experiences to the tourists.

This cannot be a spontaneous process, since it requires local authorities to improve basic infrastructures and services, but also properly plan future development of the areas, to repopulate ageing and uninhabited rural areas but also avoiding unplanned gentrification issues.

Lifelong learning in rural context, the Ghesc experience

European countries take care of the accessibility of the population to didactic activities, promoting work and training paths, through innovative ways of disseminating knowledge.

In this sense, the relevance of the theme 'education and CNH' is evident. The interest of the scientific community confirms the need to organize better-structured study paths, towards both theoretical and practical learning more strictly connected to the territory and its identity. Collaboration among universities, public or private research institutes, local authorities and professional associations is progressively strengthening, to promote training activities or specialization schools to identify new professional figures active in promoting and conserving CNH (Bonfantini et al., 2019). Sustainable development laboratories can be planned directly in rural areas by promoting their Cultural and Natural Heritage potential, regenerating their resilient community, and revitalizing the site as multifunctional place.

In this direction, the training course organized in Ghesc (IT) (Quaderni di Ghesc, 2010) village can be defined as lifelong learning, which is ongoing professional update and knowledge integrating formal education proposals and current learning opportunities. This process has the purpose of modifying/replacing learning that is no longer adequate for new social or work needs, in a professional or personal context. Indeed, the term refers not only to occupational goals but also to personal, social, and civic ones (Biondi, 2021).

Andrea Palladio - 3D geodatabase (2012): interface with a descriptive card.

In this sense, the experiences conducted in recent years through the international summer school "Laboratory of Places – Ghesc and surroundings – History, survey, evolution" (Achille et al., 2017; Achille et al., 2018) must be understood.

This Laboratory offers different activities that integrate the university teaching and concurs to the training of professional roles operating in the safeguard, conservation, and valorization of CH. This activity is patronized by ICOMOS Italia and from 2017, the summer school is also sponsored by ISPRS society. The field schools take place in the suggestive medieval partially abandoned village of Ghesc. From the first edition, it was considered essential to organize the course in collaboration with the local authorities and with the Canova Association (Canova Association, 2021), which resides in the area and promotes rural villages protection by supporting local projects.

Specifically, the Laboratory proposes a training project aimed at deepening the 3D digital techniques of geometric survey (image-based and range-based) and the methods of conservation and enhancement of Cultural Heritage. The Summer School is structured in theoretical and practice activities: lectures, best practices seminaries, on-site surveys, data processing, technical drawings restitutions, critical analysis, rural stone architecture knowledge and discovery of local territory. The course trains scholars and professionals to tackle methodological and practical problems with a critical approach and research skills by applying national and international standards.

Over the years the participants were a heterogeneous group of people that work or will work in CH field: university students (architecture, engineering, history, archaeologist); professionals (surveyors, architects, archaeologists, photographers, public employees); employees of university institutes. The different geographical and cultural backgrounds, the different ages, skills, and personal experiences make the group activities truly interdisciplinary and allow participants to appreciate the different points of view of other professional, researchers and students working in CH.

The summer school aims to enable students to know how to use tools and methods after adequate theoretical preparation, and thus to be able to process the collected data critically and develop the aptitude for teamwork and the ability to confront.

The main goals of the Laboratory are: i) encourage the learning of 3D survey methods (topographic instruments - laser scanner - close-range photogrammetric approach - UAV acquisition-structured light scanner); ii) develop the capacity of data elaboration (point clouds management, floor plans elaboration, vertical sections and profiles extraction, 3D polygonal models generation, textured mesh model generation, orthoimages production); iii) acquire methods to recognise materials (material mapping, state of decay,

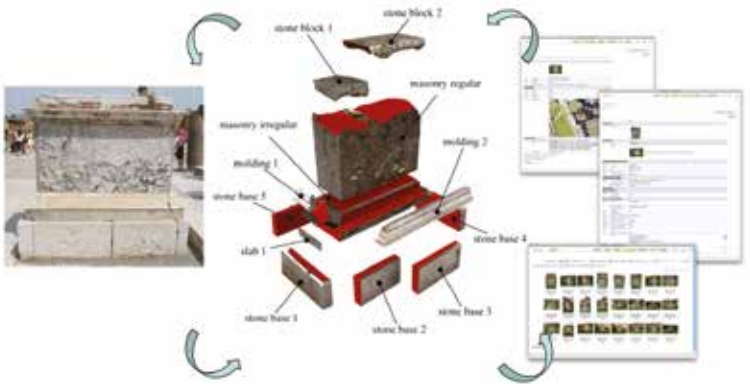
collection of samples); iv) build the capacity of 'virtual design' based on real geometric data collected and develop project hypothesis; v) develop data-sharing procedures and employing online platforms, creating 3D models and movies viewable/accessible through the internet; vi) promote the dissemination of low-cost technologies; vii) contribute to the conservation process thanks to the dissemination of best practices and through ongoing dialogue between scientific and local communities, to avoid duplication of effort; viii) help establish guidelines that ensure the compliance of conservation practices.

These training and study opportunities aim to increase the people involvement dedicated to the safeguarding and protection of the local and/or European heritage of ancient rural stone architecture.

The close collaboration with the Canova Association combines "local knowledge" and "traditional approach" with the most innovative technologies, tools, data processing methods (web, HBIM, GIS, new media, digital archives, information systems, and others). This integrates the necessary skills and helps develop the personal professional skills. A real case study allows students to test what they have learned and verify the set objectives feasibility. Working in a semi-abandoned rural village is also an opportunity to rediscover less known or forgotten places.

Managing CHN with integrated services platform

Over the past years, digital innovation led some changes in the lifecycle management of CH; however, complexities remain related to the intricate chain of decisions, to the many



The Parco Archeologico di Pompei Unified IS (2010): the outputs developed to drive 3D model construction for the IS.

The Neptune Fountain lifecycle management IS (2016): GUI key features: (1) buttons to drive the interactive visualization; (2) retrieving/ searching menu; (3) list of records stored in the IS and related to the selected element.

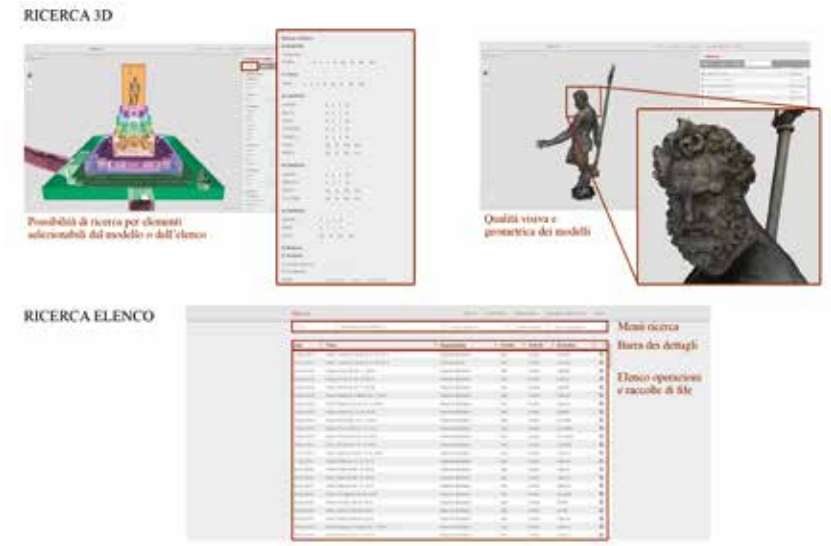
and different disciplines and professionals involved, and to the heterogeneity and fragmentation of data generating the widespread of the information in isolated Information Systems (IS). To overcome this last problem, a specific line of research has developed techniques for building 3D-based IS. The guiding idea behind is the concept of 3D database as operating tool exploiting the fact that a digital model can be seen as a vast, cognitive spatial information system that can be edited and implemented over time (Gaiani, 2012). These 3D-based ISs represent a fundamental change in our cognitive model of CH: to capture and visualize the artefacts; in the technique of archiving them; in the method of illustrating the knowledge, in the techniques to navigate through the cognitive corpus. We could learn not only how to examine the objects but also how to recognize and create new relationships between them (Gaiani, 2017).

The approach to the problem introduced by the 3D nature of the managed objects and the development of 3D-based IS has led, over the last 20 years, to the definition of the Information Conceptual Model (ICM). This development is not only related to the type of data and their semantic links but is also strongly rooted in the digital data generation processes, allowing their easy organization and retrieval and their environmental links, avoiding trivial solutions consisting simply in the use of a new technology (Apollonio et al., 2019).

In our opinion, this allows for resilient systems capable of supporting innovative actions able to improve Heritage-led resilience. Our statement is supported by various motivations:

The theoretical ground is based on strong concepts as the knowledge by vision, largely motivated by the inherently 3D nature of CH items (Zeki, 1999; Marr, 1982);

Systems can support the whole lifecycles of CH artefacts;



Data are common, but specific interfaces are addressed to different users: professional operators, tourists, citizens;

It is based on standardized, low-cost or open-source technologies;

The ICM is rooted in the used type of representation and in the real objects features and problems;

The ICM comes from 20 years of experiments and tests on different solutions;

The IS model is multiscale: from single monument or artefact, to urban or territorial scale.

The concept of "Reality Capture", coined by Autodesk, meant as the process of taking the analog world around us and putting it into digital forms that can be brought into design tools, well represents the gap that an 3D-based IS introduces with respect to the traditional method of surveying the existing, which allows to generate a 2D spatial subset through plan, views, elevation, section.

A framework, grounded on the Zeki and Marr's considerations, has been developed from 1997, working on different subject and context. These applications were designed for different types of users, with a largely scalable interface, able to support different output devices and to work at different levels of iconicity; the Parco Archeologico di Pompei Unified IS (2010) (Benedetti et al., 2010), The Palladiolibrary (2012) (Beltramini, Gaiani, 2018), the Neptune Fountain IS (2016) (Apollonio et al., 2018).

The 3D Life Cycle Management for Cultural Heritage Information System: buildings 3D models visualized in the platform, in this case the Bologna's porticoes.

The 3D Life Cycle Management for Cultural Heritage Information System: semantic graph of a building. the 3D Life Cycle Management for Cultural Heritage Information System.

This kind of solution present critical aspects in the implementation, needing appropriate answers to achieve the goals set out above:

A data organization able to contain all the types of data involved in the artefact's lifecycle;

High level of usability, so that users need limited training before being able to use the system;

High-quality reconstruction of geometry and color, since very small details have to be found and mapped;

A rendering tool able to provide high quality visual feedback, even with limited bandwidth;
Powerful and flexible search, retrieval, and exploration features enabling an easy access and data extraction from the final documentation.
The developed solution is based on five main concepts:
a. the use of 3D models as replica of original artefact with its attributes (color, shape, …) defined analyzing the real object. This allows to know the object with its visual and shape properties;
b. 3D models built as 'knowledge representation', structured and described as a series objects based on specific architectural/archaeological lexicon. This allows to know the semantic structure, the technique of construction and to organize information, according to (Apollonio et al., 2012; Apollonio, 2018), of a wide set of objects, ranging from a simple brick or bas-relief to a whole building;
c. a common database for different purposes, and for different type of users. This allows to have common contents between the users;
d. the content retargeting between different types of devices: to efficiently return the contents to a specific device and to allow the user to access the same information across multiple devices;
e. the geo-localization of the artefacts: to locate the object and to understand the object in its context.
The result of our many experimentations led to the development of a general system: the 3D Life Cycle Management for Cultural Heritage Information System part of the SACHER (Smart Architecture for Cultural Heritage in Emilia-Romagna) project, funded by POR FESR 2014-2020, and led by CIRI ICT-University of Bologna (2016-2018).
Assuming that the CH management system was lacking in efficient ICT platforms for the management and integration of heterogeneous and fragmented data sources and interconnection between private and public subjects involved in CH, the SACHER project provided a distributed, open source and federated cloud-computing-based platform able to support the complete life cycle management of various kinds of data concerning cultural assets (Bertacchi et al., 2018). Indeed, the general-purpose infrastructure integrates a variety of user-friendly services for supporting professionals in the field of CH, with advanced facilities and customized interface design for cultural services (Apollonio et al., 2017).
One of these services is SACHER 3D CH, the 3D Life Cycle Management for Cultural Heritage, aimed to manage data relating to architectural heritage and to control all phases of the related restoration process. SACHER 3D CH is dedicated to the many professionals involved in restoration activities, such as operators and public administrations, allowing the

collection, storage and conservation of the numerous data generated, with documental and operational purposes prior to the restoration project, during the works and relating to subsequent maintenance activities.
The system is based on three-dimensional digital models with a semantic structure of Cultural Heritage, used as an operational hub to connect information and geolocate data through 3D references. Access to the service takes place via the web, on any device, without installing any software and can be used in multi-user mode, through an intuitive and easy to use interface both in connection and in consultation.
3D representation is the main core of this kind of IS, and therefore visualization and interaction procedures are key elements for its overall usability. This means the availability of a semantic structure, meant as conceptual and generative structure of a 3D model-based knowledge system; tools for visualizing and browsing throughout the 3D models; user interface for adding annotations directly onto a 3D model; three-dimensional exploration of the Information System.

Conclusions

Resilient villages and neighborhoods need tools and methods able to support a sustainable planning and a resilient lifecycle. In this paper, we described the aims and the whole framework, the techniques to make new knowledge and the new digital-related approaches resilient and, finally, the possible new infrastructure able to help the whole lifecycle management of actual built environment and of pertaining CH, supporting high level complex knowledge formation by vision. Mainly, these new solutions are well-rooted in the today IT drivers: general purpose devices-based processes, mobility-based and cloud-based services, crowdsourced data exploitation, automated processes. This property will allow a constant and quick evolution without any change at level of system structure, generating more and more efficient, simple, and user-friendly processes and allowing a new vision of our WCH in the country, in the villages, in the marginal parts of the cities.

Acknowledgements

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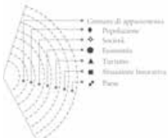
Per completare la parte di studio dei paesi abbandonati a Granada, si realizza un cerchio diviso in due corone, la più interna delle quali riporta il nome del **comune di appartenenza**, mentre l'altra il **nome del paese abbandonato**.
Come si può leggere dallo schema, nella provincia di Granada si trova un totale di **43 paesi abbandonati**. La maggior parte si localizza nella provincia di **Baza**, probabilmente dovuto alle difficoltà imposte dal paesaggio impervio e di montagna. Seguono Baza, per numero di paesi abbandonati, **Domingo Perez de Granada e Albuñol**.

Paesi con meno di 50 abitanti:



Per lo studio dei **paesi con meno di 50 abitanti**, si fa riferimento ai dati forniti dall'INE. Si considera il cerchio diviso in corone, ognuna delle quali fornisce indicazioni circa una tematica: **Popolazione, Società, Economia, Turismo, Situazione lavorativa, Paese**. Le prime cinque si riferiscono al comune, mentre l'ultima scende in dettaglio nel paese oggetto di studio. Si dettaglia il **totale della popolazione nel 2016 e nel 2018**, e abbiamo un colore a seconda se il **saldo della popolazione** risulta positivo, negativo o invariato.

Dati proposti nello schema:

- Popolazione: Popolazione totale - Donne - Uomini
- Società: Scuole materne - Elementari - Medie - Biblioteche - Centri di salute - Schermi cinema
- Economia: Agricoltura (specie coltivate) - Stabilimenti con attività economica
- Turismo: Hotel - Ostelli/Pensioni
- Situazione lavorativa: Percentuale di disoccupazione
- Paese: Nome del paese - Popolazione totale 2016 - Popolazione totale 2018

Identificazione del grado di ruralità secondo i dati della tavola precedente:

Rurale profondo

Rurale tradizionale

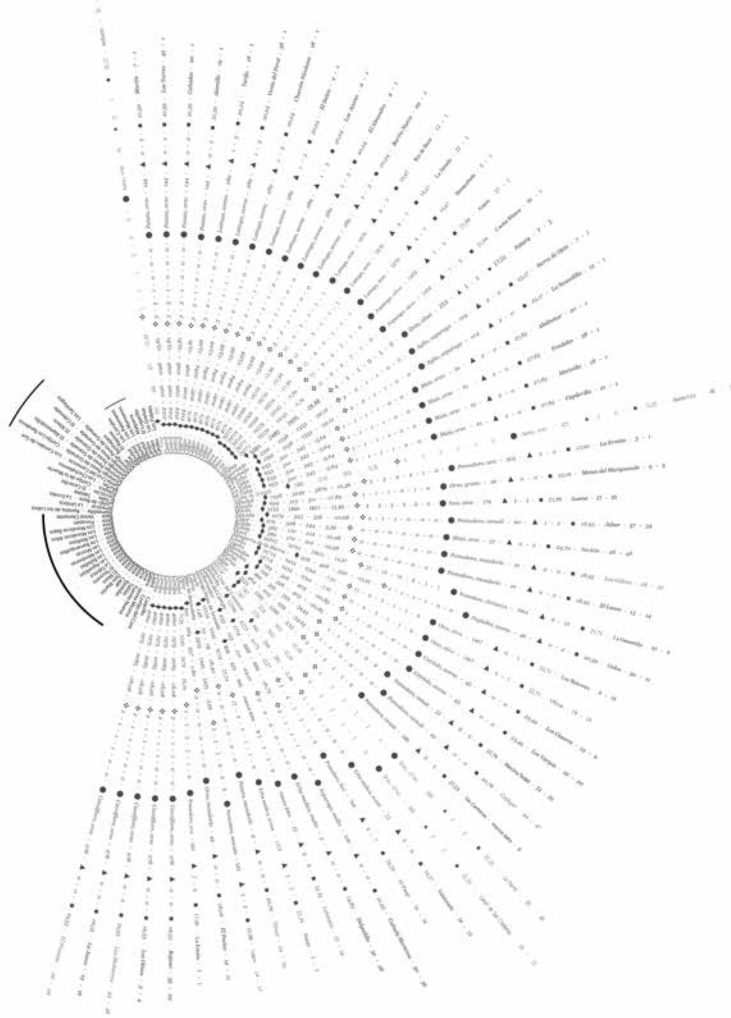
Cerniera

Valutazione della crescita o decrescita della popolazione:

Saldo positivo

Saldo negativo

Saldo invariato



Notiamo come nella maggior parte dei casi, il **numero di donne è minore di quello degli uomini**, come distinto dalle città, dove accade il contrario. E' frequente la **mancanza di centri di educazione, di salute, oltre a servizi basilari come cinema e biblioteca**. Le coltivazioni spesso si ripetono, essendo Granada e tutta la Andalucia terra di **olivi e mandorli** principalmente. La **tassa di disoccupazione** è inversamente proporzionale al numero di abitanti: quante più persone abitano nel paese più bassa è la tassa, al contrario, meno persone vivono nel paese, più alta è la disoccupazione. Infine, notiamo come nella maggior parte dei casi si è andati incontro ad un **calo della popolazione** nei paesi con meno di 50 abitanti con un alto rischio che questi, in un breve tempo, diventino anch'essi abbandonati.

ABANDONED VILLAGES IN THE AREA OF GRANADA. THE FORGOTTEN HERITAGE OF TABLATE

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Università degli Studi di Firenze-Italia

José Antonio Benavides López
Universitad de Granada, España

Infographic on mapped villages
Source: the authors from the INE data.

Rural depopulation is becoming a problem day by day. There are a lot of reasons, which are leading to a massive exodus from the countryside to the city, but all of them are strictly connected to the change that we're carrying on from the economic and social points of view.
Depopulation is, first of all, a social issue, which is manifested by the abandonment of architectures, only one silent witness to the history of these places.
Firstly, this study wants to develop research, based on statistical data about Spanish and Andalusian situation, about the depopulation process of small villages; secondly, wish focus on mapping all of these entity dwells getting abandoned or yet abandoned in Granada's territory. Among these, an analysis is performed about Tablate, developing a survey of all the village and the most important building, a tower, as a witness of the cultural heritage, too often forgotten, in these places.
The main aim of this study is the heritage valorization of Tablate, whose history, and so whose architectural importance, it's completely unknown or fades into the background compared to others villages in the same area. Besides, it wants to encourage the requalification of abandoned villages, believing that the care and the reconstruction for the cultural heritage valorisation, in a durable and sustainable form, requires the restoration of historical buildings and, in the social field, an active population, aware of the heritage it has.

Keywords: España, Rural depopulation, Abandon, Rammed earth tower

Rural depopulation

One of the greatest impactful process from a social and architectural point of view in Spain in XX century is rural depopulation, which is a controversial definition, as since a territorial aspect it's high to draw a line between rural and urban territory. Therefore, this study relies on the definition of rural, that we can give from a social point of view, and so as an urban entity with less than 10000 habitants[1].

[1] García Sanz, 2003, p. 17.

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

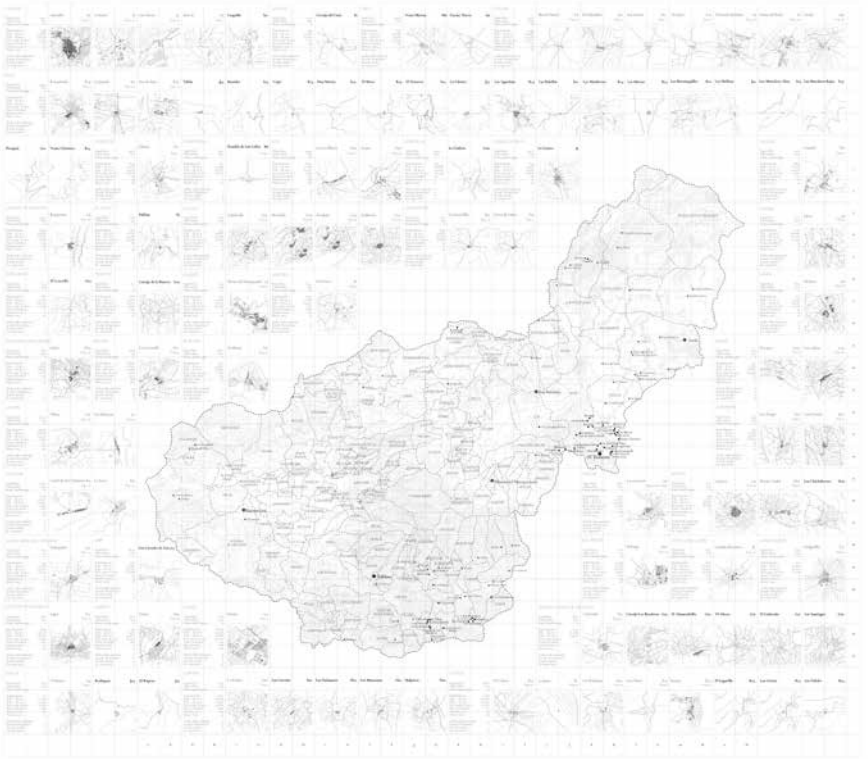


Fig. 1
Catalogue and mapping of abandoned villages with less than 50 inhabitants in the province of Granada
Source: the authors from the Base Cartográfica de Andalucía.

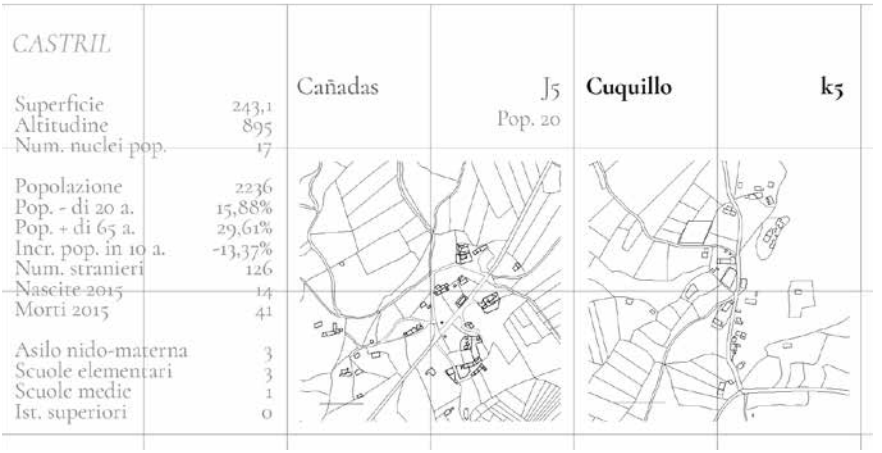


Fig. 2
Example of catalogued villages: data and plans
Source: the authors from the Base Cartográfica de Andalucía.

One of the main causes of depopulation was and continues to be, the exodus from the countryside to the city to follow economic and survival interests. There is, indeed, a Spain made of demographical desert, forgotten, which slowly seek to be known and spread out that affection and memory to the rural world, both a loophole from modernisation, which could be one of the keys to drawing the attention of the population to these realities and try to repopulate them. There are various causes and forms of depopulation. There is the one which has been going on for centuries, the one which depends on very-low-density ratios of the population that go, from year to year, decreasing more and more. This is the case of the highlands and foothills, to which we can add the mountainous areas of the northern peninsula. A second uncontrollable type is the relative one, which depends directly on the exponential growth of cities and coastal areas. This change in the distribution of the population confirms the exodus from the countryside to the city, but it is fair to point out that the Spanish rural population decreased from 1981 to 2011 only from 10.4 to 9.9 million inhabitants. A third and final form of depopulation is that one related to the concentration of population of the same rural areas, a phenomenon which is relatively rising but destined to increase more: since 1980 the number of inhabitants of countries with less than 2000 censuses decreased, while that of countries with more than 5000 residents has increased. In rural areas, the demographic crisis reaches values that suggest that some realities are at serious risk of extinction, suffering from generational ageing, continuous loss of inhabitants, all caused by the exodus of the population from rural areas[2].
Data from the INE (Instituto Nacional de Estadística) show that, according to provisional data updated in January 2020, more and more municipalities have suffered a demographic decline and have remained with less than 1000 inhabitants. Of the total of 8131 Spanish municipalities, 5007 do not reach the threshold of 1000 inhabitants. In 2011, Spain had 3834 municipalities with less than 500 inhabitants, the provisional data for 2020 pending the census of 2021, already add 4006. Also, 1400 other municipalities have fewer than 100 inhabitants or 17.2% of the Spanish total. The analysis of these data leads us directly to a worrying conclusion about the fate of some municipalities: the smaller villages are increasingly so and increase in number.
If we analyse data relating more specifically to the Andalusian territory, we can see how it counts today 109 villages with less than 500 inhabitants, of which 2 with fewer than 101 inhabitants[3] and areas of the Costa del Sol, in the South, and of the West territory, have seen a natural balance of the population in the last 30 years strongly positive, while in others, such as in the North-West and East, grew little or was negative.

[2] Federación Española de Municipios y Provincias, 2017.
[3] Instituto Nacional de Estadística, 2020.

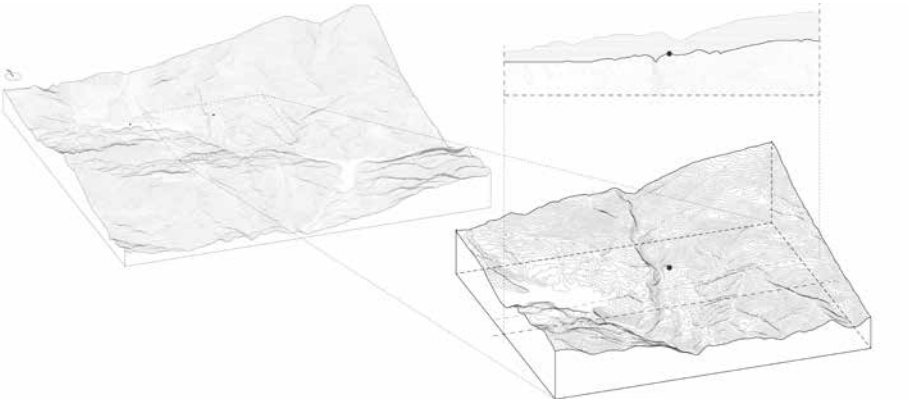


Fig. 4
Tablates's territorial framework: 3D and territory section
Source: the authors from the Base Cartográfica de Andalucía.

In the case of the province of Granada, the annual growth rate (per thousand inhabitants) is negative as of 2017, but it follows the curve of the national trend, remaining below the average only in 2016[4].

Field research and mapping

Following the analysis of national and Andalusian demographic data, the study is focused on the situation of the province of Granada, to firstly map in this territory the villages in the process of being abandoned, with less than 50 inhabitants, and those already completely abandoned. It is considered appropriate to use a topographical map base in which we can appreciate the orography of the territory of Granada, which is one of the keys to understand the depopulation of some of the villages of this province, and the subdivision of the map into a grid in such a way as to be able to locate, following an order made of letters and numbers, the catalogued villages. Of course, the use of the grid is just a device, a tool, useful for the return of a large study that had to be organized to be spread, but it does not pretend at any time to "fit" in a cold and insipid grid these villages, each of which has its own identity, which probably has not been recognized by most and, therefore, has become one of the causes of the lack of repopulation, because "forgetting that this abstraction has its basis in local knowledge, leads to the negation of a whole complex and rich sphere of the relationship between men and things, men and spaces" [5]. From the Fig. 1 we can see a distribution of the villages with less than 50 inhabitants, marked in grey, more uniform in the territory, while that of the abandoned ones, in black, concentrated

[4] Instituto Nacional de Estadística, 2020.
[5] La Cecla, 2011, p. 54.

in two main zones, both characterized by a strong orography: the Altopiano de Baza in the central-eastern part of the province and the Apujarra, in the South-East.

Once 106 countries have been located, a detailed analysis is made of the municipality to which they belong, reporting data on the territory, population and education (Fig. 2), the village itself, reporting the number of inhabitants[6] if it's not abandoned, the toponym, distinguishing in grey those with less than 50 inhabitants and in black those uninhabited, and the localization, according to the previously cited grid, besides a territorial framing on topographic base.

The study of the research for the toponym showed that one of the main problems was the identification of the villages before visiting them. The same, in fact, in some bibliographical sources of different years, the name of the village did not coincide, the toponym was not the same, and being the bibliography available not recent, was lacking in localization according to coordinates.

From the cataloguing emerges, as well as from the map, that there are municipalities such as Baza, with 15 abandoned villages, where there is the largest number of abandoned places, as well as in the south-east area of the Alpujarra Granadina, where the municipalities draw a smaller area than Baza and, therefore, several abandoned villages, but despite this, we can find a high concentration. By analysing the data on the services offered relating to education[7], we can say that, in the case of Baza, for example, a large number of active structures is offered compared to other municipality, but all of them are concentrated in the municipality of Baza itself, therefore, in territories such as these with a high orography, access to educational services is complicated due to the excessive gentrification of the educational offer.

The conclusion of the research, mapping and analysis phase, is the creation of an infographic with which we can compare data about: population, society, economy, tourism and work situation, also establishes, according to a scale of three levels, the territory level of rurality. From the comparative emerges, in black and the left part of the graphic, that Baza, is the municipality with more abandoned villages. While as the villages in the process of abandonment, in the right portion of the circle, has in most cases a negative birth rate of population, signed in red, so these urban entities are likely to disappear little by little (Fig.3).

Subsequently, to the data collected, this study includes a part of field research with a direct visit of some of the mapped villages. The information collected during the visit to each of these villages was the elaboration of a technical sheet of each of the village visited, in which gather, in addition to basic information such as the name, the coordinates, the location on the map (Fig. 2) and the year of construction or abandonment, others details about the level

[6] Instituto Nacional de Estadística, 2016.
[7] Instituto Nacional de Estadística, 2016.

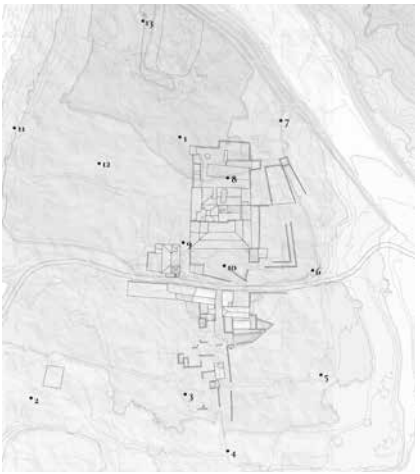


Fig. 5
Current Tablate's site plan with the 13 GPS points location.
Source: the authors from the Base Cartográfica de Andalucía.

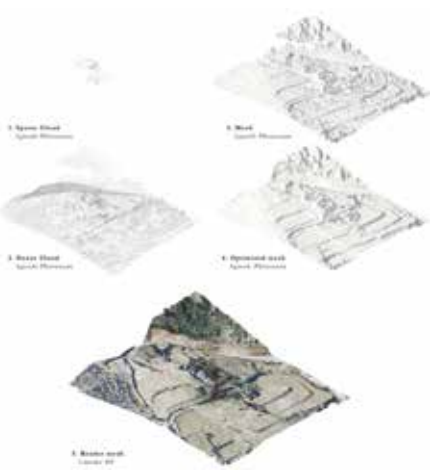


Fig. 6
Data processing steps from drone survey.
Source: the authors.

Fig. 7
Planimetry and territory sections, off-scale
Source: the authors.

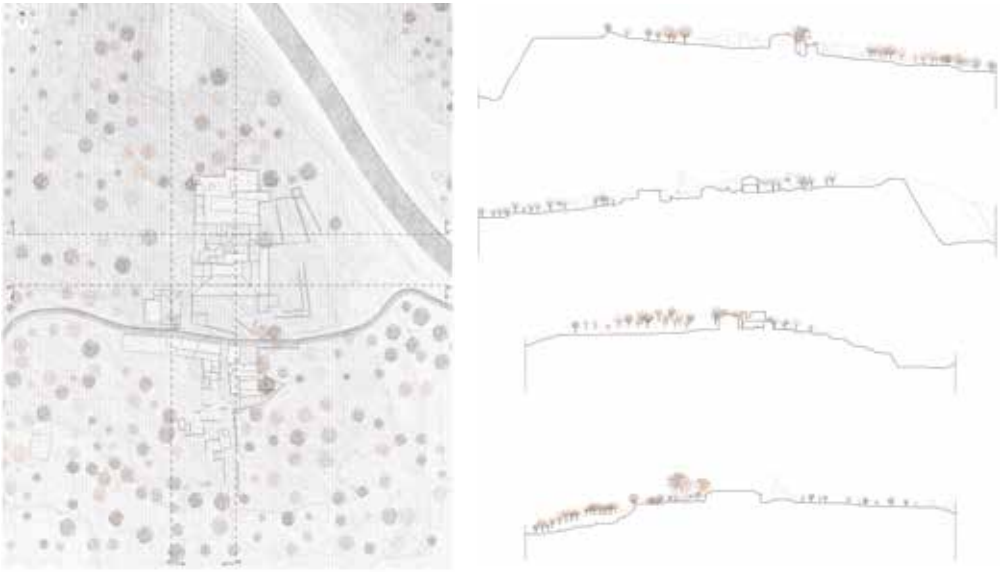
of the accessibility, the environment (altitude and orientation of the village), services (water and electricity supply, telephone network) and facilities (detailing architectural typology and its state of conservation). Many abandoned and not entirely abandoned villages have been visited, but making this sheet files made clear, on the one hand, the lack of bibliographic sources about, and on the other one, the little, or nothing, spreading of the heritage, tangible and intangible, present in most of these places, which is directly reflected on the deterioration of the structures and their state of conservation.

The need for conservation actions on historical artefacts was the reason for the choice of the case study, among the many villages visited, with the idea, not only to propose some restoration interventions but also to spread that often realities with a strong historical charge, as in the case of Tablate, fall into the oblivion of abandoned villages.

The choice of the case study

Tablate is a small urban centre located in Granada's province, exactly in Valle del Lecrín, a strategic position for the Reino de Granada, which experienced its peak of splendour during the Nazari period, following the Roman and Visigoth domination. If the locality of Tablate was important at a historical level, it certainly owes it to its physical conformation and to the landscape in which it is inserted in Granada, one of the Spanish provinces with higher altimetric levels, an average of 600 m in more than 90% of its surface area, 800m in 80% and 2000 in 5%[8].

[8] Rodríguez Martínez, 1985, p. 17.



It was precise because of the orography of the territory of the Alpujarra area that the Muslims decided to take refuge here during the war of the Alpujarras, moreover, as we can see from the Fig.4, Tablate rises in the high ground and it is difficult to access there, coming from Granada. There are reports about the village, completely abandoned since the 90s, in the Catastro del Marqués de la Ensenada of 1753, which shows the bridge with the same name.

There are not many bibliographical sources about it, except someone written by Luis del Mármol Carvajal, through which we can understand the importance that this place had from a historical point of view. Tablate was, in fact, an obligatory passage for the control of this area[9] in such a delicate historical moment, as were the first years of Christian domination, after the fall of the Reino de Granada by the Muslims. It was in the Second Alpujarra War (1568-1571), when the Tablate bridge, the only access route to the Valle del Lecrín, was crossed by the Christians and conquered. The toponym Tablate is just one of the many encountered to mention these villages[10] and seems to derive from the tablones, wooden boards, with which the bridge was originally built.

During the on-site visit, the technical data sheet is made also for other villages and the photogrammetric survey of Tablate is planned, carrying it out in two different kinds: one aerial and one terrestrial.

[9] Mármol Carvajal, 2015, pp. 279-281.
[10] Espinar, 2013, p. 87.

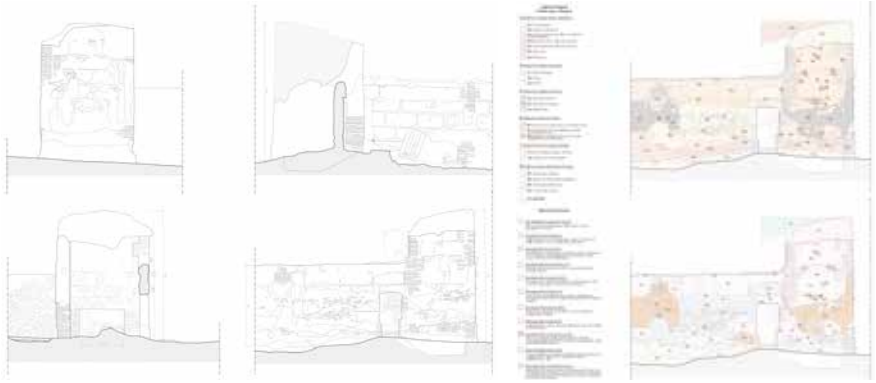


Fig. 8
Tower elevations, graphic representation scale
Source: the authors.

Fig. 9
Degradation analysis and restauration proposal for the North tower elevation, off-scale
Source: the authors.

Fig. 10
Rendering views of final tower model
Source: the authors.

To realize the survey of the village a well-consolidated procedure based on mixed aerial and terrestrial phtotogrammetry was adopted[11]. The survey campaign started with the aerial one based on the use of a drone, following various steps:
-identification of 13 points with the GPS for georeferencing the 3D model, including also the areas where the buildings have now disappeared, to be able to provide, as fully as possible, the morphology of the ground (Fig. 5);
-flight and image gathering, making two flights at different heights obtain a large-scale model (flying at 30m above ground level) and another one, more detailed to study carefully some areas of interest, to draw an exhaustive model of some structures (flying at about 20m above ground level);
-data processing and analysis, using the software Agisoft Metashape/Photoscan (to make the Sparse Cloud, Dense Cloud, Mesh, Texture and Orthophoto), Raindrop Geomagic Studio (to optimize the mesh) and Maxon Cinema 4D for the final rendering (Fig. 6).
With the data acquired from the survey and delivered in a 3D model, graphic drawings are realized as a masterplan and environmental sections (Fig. 7), from which it is perceived how much the topic of the orography and the altitude has been really important on the one hand for its construction, following the theme of defence from attacks, on the other as a possible cause of depopulation due to the difficult access, before the construction of the nearby A-348 that connects the village with Granada through the A-44.
Finally, this research aims to concentrate on the detailed study of a tower in the village, encouraging, on the one hand, a study from a historical and bibliographical level, and

[11] Rodríguez-Navarro, et al., 2016.

on the other a detailed photogrammetric survey to realize architectural drawings, that will be used as a basis to plan and justify some restoration interventions.

Close to Tablate, we can locate several other buildings, mainly castles and towers, of the same medieval era. Some of the towers were torres de alquerías y de vega (generally located in the plain, they offered refuge to the inhabitants who did not have quick access to a fortified castle in case of attack, for this reason, their surface is normally high), while others were torres vigías or atalayas, as in the case of the Tablate tower. The latter were elements of control and communication, whose function was to monitor, from a strategic point of view, any movement of enemy troops, that could threaten the surrounding territory, and then give notice to the other towers by forming an important network, which was the key to the survival of the kingdom of Granada for a long time[12].

The tower of Tablate most likely formed part of the small fortress that served to defend the garrison that guarded the bridge below. What we can see today must be a Christian building of the sixteenth century, rebuilt based on an ancient Muslim tower. It has a rectangular plan, with the largest sides oriented towards North-South, and it is built using tapial, with walls with a thickness of between 45 and 55 centimetres13. Inside there is a small room of about 1.20 metres high, accessible from the eastern side and with the floor at a lower altitude than the other sides of the tower.

To survey the tower, we proceed with a terrestrial photogrammetric survey, taking photos with a mainly projective beam approach, then moving on to the alignment of the pictures

[12] Martín García, et al., 1999, pp. 29-31.
[13] Martín García, et al., 1999, pp. 372-373.

with the software Agisoft Metashape/Photoscan14, optimizing the mesh with Raindrop Geomagic Studio and rendering it with Maxon Cinema 4D. During the alignment and orientation phase with Agisoft Metashape/Photoscan, georeferencing is carried out based on four points in common between the model coming from the terrestrial survey and the same four points coming from the aerial one, which was previously geo-referenced with the 13 GPS points before mentioned. Once the 3D texturized model is obtained, the vectorization of it is carried out with the use of the software Autodesk Autocad and so to draw plants, elevations and sections (Fig. 8).

On these architectural documents, thanks to the level of detail of the texture generated by photos originally taken during the flight and image gathering phase with low ISO value to avoid noise in the photo, in RAW format and with detail shots, it was possible to proceed to an accurate decay analysis, with the consequent proposal of restoration (Fig. 10).

The decay analysis is etiologically organized, dividing the degradation encountered according to the cause that has originated them, considering this a method of intuitive and easy reading to move to the subsequent restoration proposal. It seeks to associate to each type/cause of degradation one or more restoration interventions, for eliminating or curing the cause, intervene effectively and sustainably on the artefact (Fig. 9). Finally, rendering views of the final model is generated (Fig. 10).

Conclusions

This study aims to highlight only some of the issues which comprehension is necessary to understand depopulation, a process as interesting as complex, which claims to be studied in the most interdisciplinary way, bringing out its innumerable facets.

Despite the rigid methodology of the study, the organization of data and the restitution of architectural works, this research aims to show and spread that there are many abandoned countries with a high heritage, tangible and intangible, which must be protected, preserved and diffused. It is bitter that abandoned villages, which now don't have a certain name and are difficult to be located on a map, but which continue to be placed, according to the definition given by Marc Augè 15, being them identity-related, relational, although in an often unknown past, and historians, are unfortunately anonymous identities. We want to believe that this is only a temporary situation, waiting for a new "baptism", a repopulation.

[14] Rodríguez-Navarro, 2012.
[15] Augé, 2010, p. 77.

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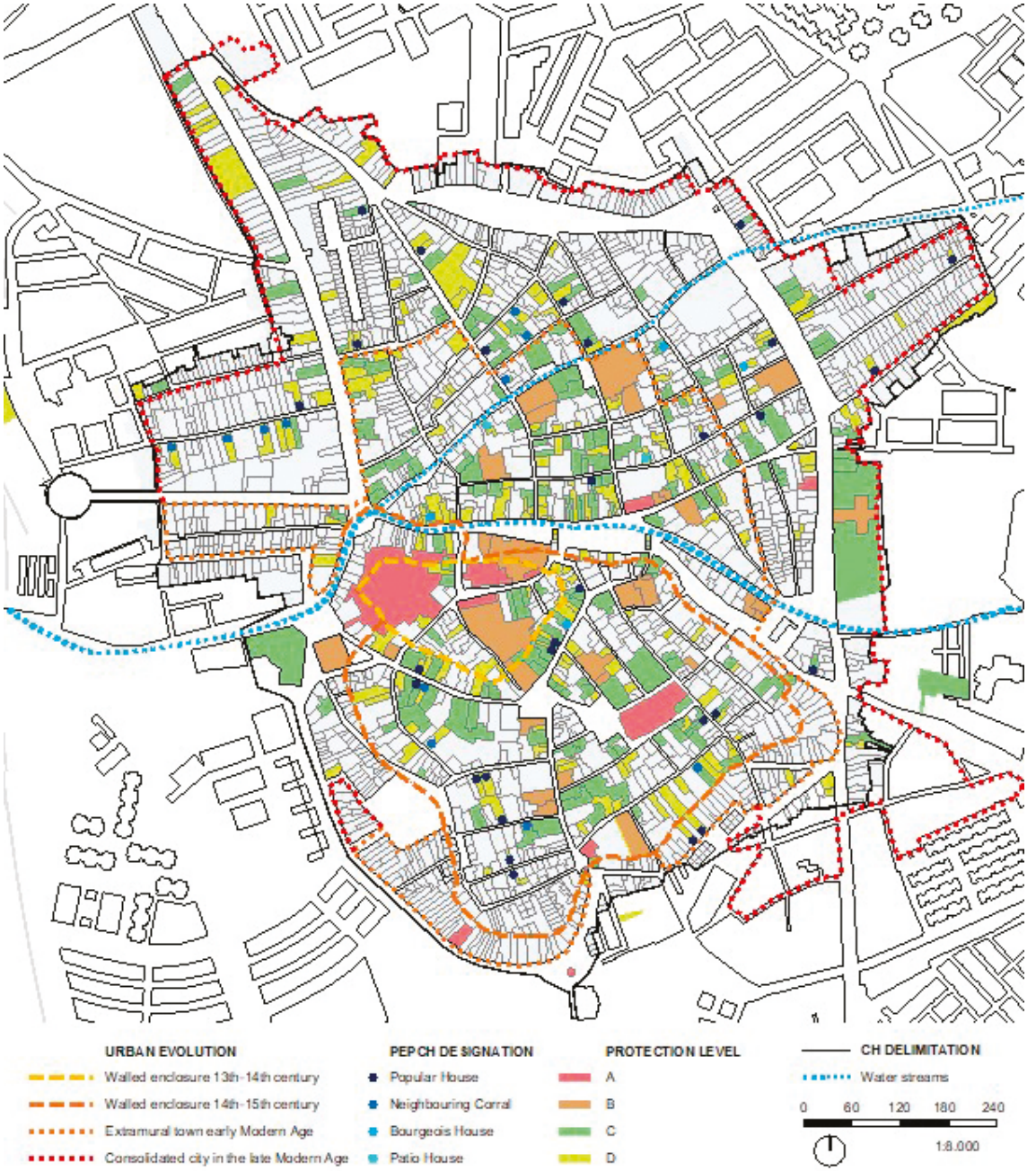
URBAN EVOLUTION
Walled enclosure 13th-14th century
Walled enclosure 14th-15th century
Extramural town early Modern Age
Consolidated city in the late Modern Age
PEPCH DE SIGNATION
Popular House
Neighbouring Corral
Bourgeois House
Patio House
PROTECTION LEVEL
A
B
C
D
CH DELIMITATION
Water streams
0 60 120 180 240
1:8.000

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The hallway, patio and stockyard vernacular house in Utrera 1/8.000. Elaborated by the authors on the plan of building cataloguing of the PEPCH of Utrera.

In contrast to general studies on singular architecture, of well-known authors or with wide social recognition, research on subjects such as the traditional house has been more limited. Other works carried out by the authors in recent years have allowed us to identify and characterize a typology of a vernacular house that was until then embedded in generic typologies which it shared certain features with, but in which a wide variety of typologies were included. It's a house linked to the expansion and densification of the medieval urban fabrics during the Modern Era in the province of Seville and surrounding territories, which remained in full use until the XXth century when it fell into disuse due to technological changes in the agricultural field. This type of house generally occupies plots of narrow facade and a generous depht. It's formed by double bay-built bodies alternated with interior free spaces, following a typological sequence composed by facade body, patio, intermediate body and stockyard in the back. The whole set is registered by a system of independent corridors - hallway and intermediate corridor - that keeps the rooms away of passage and allows the clean access of animals and tools directly to the stockyard. After the initial work entitled "The no name house" , this work focuses on Utrera, a city located in the south of the Guadalquivir Valley, where the presence of this popular house with hallway, patio and stockyard is evident.

Keywords: *popular house, vernacular house, traditional house, Seville, Historical Ensemble*

Introduction

The no name house

This work gives continuity to a line of research that has made it possible to identify a traditional popular house so far included under a wide range of names - often more connected to the social position of its inhabitants than to its architectural features - and typological frameworks with which popular domestic architecture in Seville is generally identified. It's a house without cultural recognition, a house that doesn't even have a name.

It is a type of house built between walls, associated with the medieval plots and characteristic of the expansion and densification of urban areas in the Modern Age in the province of Seville and surrounding territories. It is generally based on large blocks that generate plots with a narrow facade and generous depth, with dimensions varying from 6 to 12 metres of facade and from 20 to 40 metres depth. The surfaces vary from 100 to 300 square metres.

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

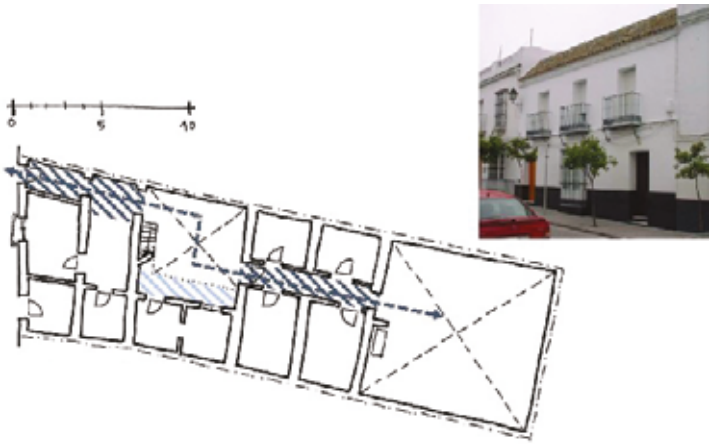

Fig. 1
Hallway, patio and stockyard vernacular house in 36 Sevilla street. Cataloguing card C-36 of PEPCH of Lebrija Scale 1/250 plant scheme elaborated by the authors (Gómez Martínez, V., 2017).

The typology is configured through the juxtaposition of built bodies with domestic free spaces in between, according to a clear typological sequence defined by the presence of a façade body, a patio, an intermediate body and a stockyard at the back. The whole structure is registered by an independent system of passages consisting of the hallway and the passage of the intermediate body, which separates the rooms from the access of animals and tools to the stockyard. These elements correspond to the needs of the inhabitants of these houses who worked the land and needed space for the storage of tools and supplies. The built bodies consist usually of a double bay, what allows direct ventilation of the rooms from the street or from the inner free spaces. They are generally one floor high and incorporate a garret called "soberado" – a sort of attic originally destined for the storage that gradually gained height to accommodate a housing use -. Auxiliary structures such as the kitchen or staircase are often located in the patio, where a side gallery is sometimes integrated to improve access (Fig. 1).

The presence of open spaces and limited heights generate a low-density urban fabric, with a built ratio generally lower than 1,25. They are based on simple construction systems, linked to local resources. The walls are made of tapial, brick or local stone masonry – particularly those located in the mountain areas - from 40 to 70 centimetres thick while the horizontal structures are made of trunks or wooden beams with bricks in the space between, covering gaps between 2.5 and 3 metres. The floors and roofs are executed the same way, the latter supported directly on the walls of a different height or under a simple scissor structure executed with trunks. The coverings are made of ceramic curved roof tiles, although many of them have suffered a strong process of substitution - mainly in

the internal bodies. Their appearance is simple, based on the ubiquitous white of the whitewashed walls. Only the portals receive some ornament - with a simple raised frame, more prominent at the top - and the windows that slightly emerge from the plane of the façade.
Throughout its extensive chronology - which begins with the post-recovery stabilisation of the 14th century and ends with the industrialisation of agriculture and construction in the first half of the 20th century - it has retained its characteristic simplicity, although the portals have undergone a certain process of formal adaptation in the baroque and, over the last few decades, they have received a clear regionalist influence.
According to their typological characteristics, it has been identified as "hallway, patio and stockyard vernacular house" - "casa popular de zaguán, patio y corral" in Spanish (Gómez, 2017).

Methodology

The initial study was developed with a clear methodology based on three work lines.
Preliminary work based on bibliographic and archive research, with the aim of making a first draft of a recognisable typology that aimed documentary record. Specifically, an initial typological scheme, an approximate territorial recognition and a general historical framework were pursued, what allowed to establish the scope of study, as well as three first case studies: Carmona, Cazalla de la Sierra and Lebrija, as they corresponded to each one of the three recognizable geographical units in the field of study and all had a PEPCH with a great amplitude and resolution.
Characterisation of the typology identified from the analysis of the documentation contained in the PEPCH, drawing up a database that coherently integrated the different criteria of each plan, in order to allow a collective reading of all of them. This allowed the synthesis of the elements that characterise this typology. Also, the planimetric location allowed the chronological framing in the urban evolution processes.
Contrasting results through partial publications and presentations at international meetings on heritage and vernacular architecture.

New studies

The initial study already pointed out studies cases for further research, such as Arahal, Constantina, Marchena or Utrera. At the same time, it was established that, for the correct identification of a typology of vernacular architecture, it was necessary to read synthetically local works which, although offering precise results, generally lack a vision of their true cultural magnitude.

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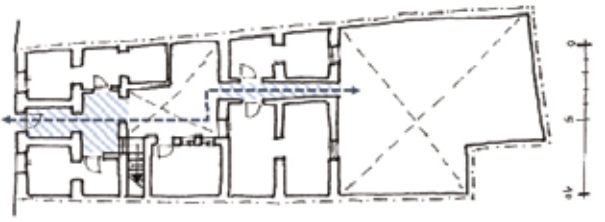

3

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Fig. 2
Floor plans and facade photographs. Popular House and related typologies Patio House, Bourgeois House and Neighbouring Corrals. PEPCH Tomo 1, p. 60-62.

Fig. 3
House in 35 Eduardo Dato Street. Floor plan scheme, scale 1/250, drawn up by the authors from the PEPCH catalogue card of Utrera.

Fig. 4
Formal evolution of the hallway, patio and stockyard vernacular house. A and B: House with a garret and a protruding entrance in Mudejar formalization (16th century). C: House with balcony and moulded portal of Baroque formalization (17th-18th centuries). D: house with a balcony and windows in a historicist formalization (19th century). E and F: house without ornamentation and view of the hallway. Images from the Utrera PEPCH catalogue cards.

The continuation of sustained bibliographical research has made it possible to recently locate examples of this house in the province of Cádiz (Feduchi, 1978). At the same time, work is being carried out whose fundamental objectives are the systematic revision of the methodology and the identification of the hallway, patio and stockyard vernacular house in new locations, in this case the city of Utrera.

Vernacular housing architecture in Utrera

Despite the extension of the historical centre of the city of Utrera - which in the 1950s already exceeded 34,000 inhabitants -,a large popular housing settlement, there are no direct references to its vernacular architecture in any of the major works carried out about this topic in Spain in the 1930s (García, 1930; Torres, 1930). The first direct reference can be found in the 1970s (Feduchi, 1978), although the focus is on the neighbouring houses and not on the specific typology this work deals with.

This implies a reflection of the methodological difficulties faced by the study of vernacular architecture, which requires the participation of transdisciplinary teams in the development of study at various scales to obtain a complete vision of these cultural heritage assets. Not even the laws about Historical Heritage - whether national or regional - have managed to establish specific mechanisms for the valorisation and protection of vernacular architecture. On the contrary, they leave its protection under the general extensive figure of the "Conjunto Histórico" (CH). In Spain, this is one of the categories of "Bien de Interés Cultural" (BIC), that states the maximum level of protection of groups of buildings with heritage interest - from complexes to squares or entire towns, as well as rural areas. It focuses on environmental values and formal continuity, without valuing each individual building that makes up these ensembles. For the purpose of this work, it has been translated as Historical Ensemble.

Heritage laws require the elaboration of specific urban protection documents for each CH, which have become the only works confronting a study of vernacular architecture faced by transdisciplinary teams - usually composed of architects, urban planners, historians, archaeologists and anthropologists -. They are also the documents that allow the highest level of detail, even if they are limited to the local scale by the own definition of the concept. The synthetic reading of these documents is essential to understand the true cultural dimension of vernacular architecture, going beyond the local scale. Due to the urban approach inherent to the figure of the CH, these are documents of an urbanistic nature, which can be developed and integrated into the general urban plans or as an independent document (PEPCH), as in the case of Utrera.

Tab. 1
The hallway, patio and stockyard vernacular house in the catalogue of the PEPCH of Utrera.

	hallway, patio and stockyard house					
PEPCH designation \ protection level	**A**	**B**	**C**	**D**	**total**	**%**
Patio House		0	0	0	2	**2**	**4,35**
Bourgeois House		0	0	2	1	**3**	**6,52**
Neighbouring Corrals		0	0	3	7	**10**	**21,74**
Popular House		0	0	16	15	**31**	**67,39**
total		**0**	**0**	**21**	**25**	**46**	**100,00**

The Historic Ensemble of Utrera

The CH of Utrera had a long way until its effective protection. The inchoation of the expedient took place in 1982, within the framework of the national Heritage Law of 1933, by means of a succinct resolution in which no reference was made to the values of the Historic Ensemble. On the contrary, only a precise literal delimitation was included. Despite the requirements of this law and the subsequent one of 1985, twenty years passed until the declaration of the CH of Utrera as a BIC, as well as its inclusion in the General Catalogue of the Historic Heritage of Andalusia - required within the framework of the Law of the Historic Heritage of Andalusia of 1991 - through Decree 100/2002. The latter only makes a brief historical review of the evolution of the city to justify the delimitation and does not deepen its heritage values.

The Special Plan for the Protection of Historic Ensemble of Utrera

After this delay of two decades in the declaration as a BIC, the urban protection of the CH of Utrera arrived promptly. The PEPCH started processing the advance documents only a couple of years later and completed its preparation and administrative processing in just five years, with final approval date in 2009. The redaction team included a large number of collaborators and consultants from different professional fields, headed by Fernando Mendoza Castells, Fernando Amores Carredano and Pedro Pérez Quesada - architect, archaeologist and geographer respectively. The result is an extensive and complete document that analyses in depth the history and evolution of Utrera, both from the archaeological point of view and from the point of view of urban and built spaces.

Vernacular housing typologies

The PEPCH integrates a complete informative memory into which many parameterized data of the plots and the free spaces are dumped. Also interesting is the collection

of significant elements of local architecture. It establishes seven residential typologies, with a dominant presence of the vernacular housing: Manor House, Patio House, Bourgeois House, Balcony House, Flat House, Neighbouring Corrals and Popular House (Fig. 2).

The no name house would be part of the popular house, which is no more than a common denomination that includes different types of houses, among which those that respond to the sequence façade body, patio, intermediate body and stockyard are clearly identified. Indeed, the illustrative image included in the PEPCH memory for this popular house corresponds to the typology of a popular house with hallway, patio and stockyard.

> Buildings from the 18th century or earlier of a modest nature are considered to be popular houses, with a predominance of the patio house typology, although there are many without a defined typology or which are a mixture of several ones due to the transformations produced over time.
> In general terms, they are characterised by conserving the original level, which may be lower than the current level of the street. They tend to be very rural, with one or two floors and a tile roof, with a predominantly solid façade and a piled-up entrance, with windows with flying grilles and balconies that either have a fairly large shelf in the statelier houses, or with flat grilles in the more modest ones. These buildings are generally in very poor condition or abandoned.
> Most are popular houses from the 18th century, whose basic structure began in the 16th century and continued with the same characteristics until the 18th century.

Cataloguing

The protected Historical Town encloses 2.123 cadastral plots. In correspondence, the PEPCH includes an extensive catalogue of built assets that contains a total of 433 catalogue cards (20.39%) corresponding to buildings protected with levels A, B, C and D. These are single-page cards - two in the cases of A and B listed buildings- including the following information organised in three blocks.

- Location, with general and local plans.
- Distribution, with ground floor scheme - rooftops scheme in the buildings that have not been accessed.
- Building data, where the typology, style, chronology and other data are reflected. Permitted and prohibited interventions are indicated. Photographs and additional graphic information are included in the buildings catalogued A and B.

Protection

The PEPCH establishes four levels of protection for buildings - A integral, B global, C typological and D environmental - according to their heritage values. These levels of protection gradually allow a greater degree of intervention in the buildings. The interventions permitted

are described in the report, while the protected elements are specified literally in the catalogue sheets.

In addition, the PEPCH seeks to preserve the configuration of the protected buildings by preventing an increase in their built area in buildings catalogued A, allowing an increase of 5% in buildings catalogued B and 10% in buildings catalogued C and D. In the latter, the occupation of the stockyards in the back of the plots not specifically protected in the catalogue cards is allowed in accordance with the urban planning rules of the PEPCH itself (up to 70% of its total area).

The hallway, patio and stockyard vernacular house in Utrera

Typological framework

The PEPCH provides a definition of the seven above-mentioned typologies which are sometimes based more on compositional and formal criteria than on purely typological criteria - spatial structure and relationship between elements of a building. So, the differences between Bourgeois House and Popular House are sometimes reduced to formal aspects. Moreover, bourgeois or popular houses which have been modified to hold various dwellings inside them are identified as Neighbouring Corral.

After a close analysis of the complete catalogue of protected buildings, it was found that the vast majority of the hallway, patio and stockyard houses are designated by the PEPCH as Popular House. At the same time, we can identify this same house in buildings designated as Neighbourhood Corral and, to a lesser extent, as Bourgeois House and Patio House (Tab. 1).

The use of these hallway, patio and stockyard houses as neighbourhood corrals is the result of their typological adaptation when dimensions allow it and housing needs exceed the available supply at a given time. This is a process identified by the authors in other CH previously analysed, such as Lebrija or Carmona (Gómez, 2020).

These forty-six cases reveal a significant presence of the hallway, patio and stockyard house in the CH of Utrera, as they represent 10,62% of the 433 buildings catalogued by the PEPCH.

Characterization

Typological and architectural configuration

The descriptions made in the PEPCH memory do not make great allusions to the mechanisms of typological composition, beyond the patio as a distributing element. However, an analysis of the ground and roof plans included in the catalogue cards

make it possible to clearly recognise the presence of this hallway, patio and stockyard vernacular house.

The typological sequence by which built bodies alternate with free spaces is systematically recognised, with the bodies generally being built with a double bay (78,26% of cases). There are hardly any buildings which have lost their stockyard due to segregation and they are mainly occupied in part by auxiliary constructions (60,87%). The hallway is positioned either to the left or right of the façade, and is positioned in the centre when the size of the façade front allows it.

Access to the patio and the stockyard in the back is through the hallway and the passage of the intermediate body respectively, which are generally almost in line. Although stairs to the upper floors are located in both patios and stockyards, these are often located inside the built bodies in response to the habitability requirements of the first floor, which is usually presented as a full-height floor (84,78%). The presence of houses of this type with a garret upstairs in Utrera is truly a minority (15,22%), with no single-floor buildings (Fig. 3).

The facades of these houses reflect the long chronology of this typology. Thus, we find buildings with a simple formalisation, whitewashed, with barred windows and protruding doorways, heirs to the Mudejar tradition. In addition, there are houses with more elaborate doorways and projecting windows, with elements of the Baroque adapted to the limited resources of the humble population. The most recent buildings have more stylised forms of a historicist nature. At the same time, there are buildings of extreme simplicity, where no formal elements are arranged (Fig. 4). The elements with the greatest representation are the simple doorways (60,87%), the overhanging windows (69,57%) and the balconies on the first floor (63,04%, significantly higher than other studies carried out).

Unfortunately, neither the memory nor the catalogue cards provide much information on the construction systems employed. In the cards, it can be seen that the traditional construction systems have been largely preserved (93,48% of cases) but without providing any further information on them. Another significant fact about the conservation of traditional construction systems is the maintenance of ceramic tile roofs (69,57%).

These traditional construction systems are based on simple materials. The walls are made of tapial or brick with spans of between 40 and 70 cm, generating gaps of between 3 and 4 m. The horizontal structure is made up of logs or wooden beams, the intermediate space of which is filled with bricks, wooden boards or a combination of both when the beam is greater. The roofs are sloping, made of ceramic tiles, supported by structures such as those mentioned above, which rest on walls of different heights or on simple wooden trusses. The walls are whitewashed and the traditional flooring was made of ceramic tiles and rammed earth

in the interior open spaces. This is simple architecture, with few concessions to ornamentation, beyond the protrusion or moulding of the doorways or the grille on the windows and balconies.

The dimensional parameters of the buildings show a clear predominance of average plots with surfaces between 100 and 300 m^2 (69,57%) with fronts between 6 and 10 metres (63,04%). The building density of these properties is relatively low, offering an average of 1,17 square metres built per square metre of plot and being in 84,78% of cases below 1,50 m^2/m^2. These results are consistent with those obtained in CH previously analysed, such as Lebrija or Carmona.

Chronology and urban location

The dating in the catalogue cards reflects the broad chronology of this typology, with buildings dating from the 16th century to the first half of the 20th century. Almost all of the buildings originate between the 17th and 19th centuries (82,61% of cases), with those dating from the 17th and 18th centuries (50,00%) being especially noteworthy. This dating corresponds to the location of the buildings, of which 63,04% are located in the areas of extra-mural growth of the city during the Modern Age. The rest are located inside the most recent walled enclosure (14th-15th century), without any being located in the original walled enclosure (Fig. 5).

It is significant that the buildings of this type identified by the PEPCH as Neighbouring Corral correspond to a relatively recent chronology (19th century) and are located in the growth areas of the late Modern Age, fundamentally in the northern area of the town centre. This tells us of a process of adaptation of the hallway, patio and stockyard house to neighbouring houses during the 19th century.

Conclusions

This work has led to valuable conclusions for the line of research, which can be summarised as follows.

The extension of the reconnaissance work of the hallway, patio and stockyard vernacular house with Utrera as a new case study confirms the validity of the methodology used despite the natural differences between the different PEPCH analysed and the lack of elements such as ground planes or interior photographs - which made typological reading difficult but not impossible - allowing the database to be filled in with new sheets with most of the fields completed.

Obtaining and comparing new data allows us to make a more precise profile of the

characteristics, territorial implantation and chronology of this hallway, patio and stockyard house. In the case of Utrera, the low level of conservation of the garrets stands out as a representative element, with the vast majority of the buildings having full height upper floors. Equally significant is the presence of balconies on the facades. Both characteristics respond to the predominance of living uses as opposed to agricultural spaces in the house.

This typology has remained in full use for more than four hundred years thanks to its clear spatial organisation, which gives it a great capacity for functional adaptation - to the living uses of the upper floors or transformation into a neighbouring house. Its future preservation depends on the ability of institutions and architects to respond to the three major risks it faces.

The preservation of traditional construction systems. The emergence of industrialised building systems in the fifties of the last century marked the beginning of a strong process of partial and total replacement of these buildings. Today they are appreciated for their formal and bioclimatic characteristics, but it is still necessary to provide further training for technicians specialised in the conservation of these systems.

Accessibility. One of the reasons for the abandonment of many historical centres is the difficulty of access to the houses by car. Direct rear access to the stockyards in cities such as Arahal facilitates the conservation of these buildings, which are unable to accommodate car access on their main facades. The system of independent access formed by the hallway and the passage of the intermediate body, once used for animal access, is today a clear opportunity to solve mobility problems by means of electric light vehicles. Accessibility to the upper floors is easily resolved thanks to the distribution of accesses from the patios, which allow for the use of lifts without major damage to the building.

Adaptation to current housing needs. The dimensions of these buildings, which once hosted modest housing and free and built spaces for agricultural activity, offer strong challenges. On the one hand, the dimension of the plots generates real estate pressure on these buildings, which can be replaced if the allowed densities are not controlled. On the other hand, the limitation of economic resources reduces the chances of finding families capable of facing the purchase and conservation of these buildings because of their generous dimensions, once the agricultural spaces are dedicated to living use. Institutions and architects will have to deal with these situations rigorously and creatively to incorporate these buildings into the real estate market without compromising their heritage values.

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a


b


c


d

TOWARD SUSTAINABLE REGENERATION OF HISTORIC ENDANGERED TOWNS: STRATEGIES FOR INCREASING RESILIENCE

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Photographic report of the case studies: **a)** Château de Germolles (Mellecey, France); **b)** Castello di Riolunato (Modena, Italy); **c)** Castaño de Robledo (Huelva, Spain); **d)** Terena Parish (Alandroal, Pourtugal).

Europe has numerous urban sites ranging from towns to hamlets with valuable heritage significance that are experiencing progressive and harmful abandon because of urbanization and globalization phenomena. Tangible heritage values (historic buildings and urban settings), as well as intangible ones (history, cultural and social values, and handcraft) contribute in preserving the site identity and maintaining the collective memory of local communities. The town architecture, together with its complex of symbols, conserves the place identity and characterizes the site historic development. Several reasons are responsible for this abandon process, such as unfavourable location, ending of industrial/commercial activities, natural disasters, lack of services, progressive aging of the local population, and social replacement. Globalization has a deep impact on community development, town improvement and economic growth; meanwhile it presents several vulnerability aspects that hinder the system adaptation capacity to react to environmental changing and to control citizens' health and safety. The recent COVID-19 pandemic experience clearly demonstrated a transnational system weakness. Urbanization provides economic, social and cultural opportunities that can enhance life quality; on the other hand, sudden changes in urban density and growth can weaken the sense of place (the specific 'genius loci'), the integrity of the social fabric, the traditional character of urban areas, and the identity of communities. Here we propose a new approach for contrasting the impoverishing of historic towns, which takes into consideration the different evolution of plant and animal organisms. While the animal organism functions as a unique one, in which single organs are strictly interdependent on each other, plants are modular organisms, where each single part functions independently on the others. In this way, single parts of the plant individual can be removed without threatening the organism survival. The regeneration strategy we propose tends to assimilate the functioning of small towns and hamlets to the plant organism, i.e. small communities independent on large and globalised societies and characterised by high resilience potential for contrasting unfavourable situations. Opposite to this model, globalisation represents centralised operative authorities that are responsible for the whole country, thus recalling the animal organism regulated by a single operation centre. Our model is based on a conscious and sustainable improvement of site resilience involving public administration and citizens by mitigating the impact of globalization process and re-discovering the cultural identity, history and traditions of urban areas, in other words, we propose to diffuse the "vital resources of the towns" at different levels and contests. Abandoned, neglected or disused villages and towns require restoration of their integrity in every respect: historic, artistic, architectural, social and cultural. This regeneration strategy should follow sustainable procedures, which requires the detailed knowledge of building material, of monuments and

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urban vegetation, as well as their decay phenomena in order to design an effective restoration program considering long-term conservation and durability. In order to realize a real regeneration, restoration should not be limited to building recovering and compliance, rather, it should aim at drawing a new cultural and social identity. This target represents a challenge that should take into account architectural aspects linked to: accessibility, historical and artistic context, as well as economic sustainability including agri-food excellence and specific traits of the territory. The rationale of this strategy is to maintain a balance between historical and landscape features, to avoid isolation of towns, and to promote their employment not only as tourist destination but also as living centres.

Keywords: Resilience, Sustainable Restoration, Multidisciplinary Approach, Mitigation of Globalisation Effects

Introduction

In Europe, numerous urban sites ranging from towns to hamlets with valuable heritage significance are experiencing progressive and harmful abandon because of urbanization and globalization phenomena. Most of them result from different construction layers, originated in different historic eras, through different civilisations, testifying continuous re-foundation events that shaped and modified both landscape and territory (Sloan 2018). Several hamlets have been completely abandoned and are now described as 'ghost towns', whereas others are still inhabited, even if they are experiencing depopulation, social and economic decline and depletion as globalization consequence. Many countries, particularly in southern Europe, face challenges relating not only to globalisation, but also to environmental and energy concerns, population aging and demographic shifts, technological transformation and innovation demands, and social inequality (Labianca & Navaro 2019).

Economic decline and depopulation of rural areas started in the early '900 and increased after World War II, resulting from the excessive urban growth that characterised social dynamics in the twentieth century. The rate of emigration accelerated between 1950s and 1960s when inhabitants of isolated and mostly mountain villages searched for better economic opportunities and more comfortable lifestyle in urbanised areas. In this way, small, fortified hilltops and mountains villages, once considered protected and safe locations, were abandoned in favour of towns located in valleys and plains. Unfavourable location, ending of industrial or commercial activities, isolation, lack of employment opportunities, progressive aging of the local population, natural disasters, particularly earthquake and floods, are the major drivers of abandonment. Moreover, small, isolated towns are often excluded from modernity in terms of communication, viability, infrastructure and services (East 2016; Sloan 2018).

Recently, there have been increasing interest and attention for so-called ghost towns at the political and popular level and several projects gave rise to initiatives for their re-awakening. The cultural process leading to the re-evaluation of neglected towns and hamlets takes into consideration both tangible and intangible heritage values, which contribute in preserving the site identity and maintaining the collective memory of local communities (Ashworth et al., 2007). According to the UNESCO Recommendation on the Historic Urban Landscape (2011: First Conference, 2019: Second Consultation), the tangible historic resources are represented by buildings, monuments, and urban settings, while the intangible heritage include history, culture, tradition, and all activities performed in the urban environment aimed at preserving the site identity. Tangible and intangible heritage constitute the cultural landscape representing the combined work of nature and humans (Zarnic et al 2017), thus, they are strictly linked to the built and natural environment, to the sense of place and local population memory. While tangible and intangible heritage include the entire capital of knowledge derived from human development, the word 'memory' represents the spatial, social and cultural constructions linked to the human knowledge (Hosagrahar et al. 2016).
The town architecture, together with its complex of symbols, conserves the place identity, represents its historic development (Low & Altman 1992; Tuan 1977), and can be considered as the roots for keeping the site memory alive. Under this perspective, abandoned towns and hamlets can be considered no longer as places to be shunned, rather as resources, which can activate processes of regeneration and local development with positive impacts on local community and its economy, environment, and landscape (Di Figlia 2016). However, this theme is still poorly explored by academics, with the exception of few studies in architecture and anthropological sciences.

Toward novel approaches for regenerating and re-evaluating historic endangered towns

Here we consider a system of hamlets and small towns distributed in different European countries (Fig. 1), characterised by similarities in relation to history, environment and cultural identity (Tab. 1). These locations are experiencing the same demographic and economic stagnation and abandon phenomenon. Because of these shared features, they represent a case study for proposing a common model of re-evaluation based on cultural heritage and landscape preservation, environmental protection, and sustainable economic improvement for the local population.
We propose an integrated approach that can be applied to these realities and further extended to similar ones. The rationale is to search new opportunities for local population and to

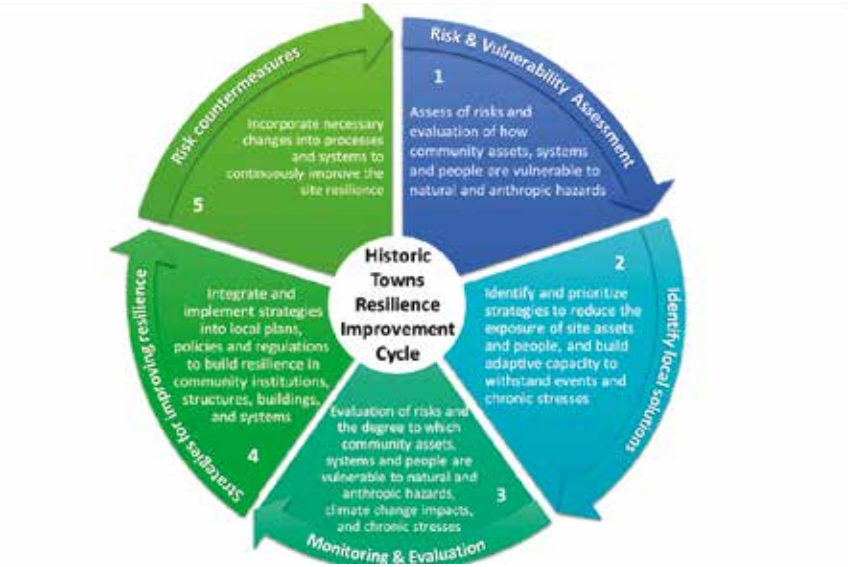

Fig. 2
Flowchart of the HTRIC.

attract immigrants through sustainable measure for a real re-awakening of these areas. At the meantime, such solution should take into consideration conservation and evaluation of cultural heritage and historical buildings.

In the last decade, abandoned villages gained new interest and the way they are now described and perceived let us consider them no longer as rubbish but as resources (Sloan 2018). In Italy several re-awakening projects have been proposed for abandoned villages, most of them indicating tourism as the preferred vehicle for bringing these sites back to life (Sloan 2018). However, the touristic solution does not represent the most environmental-friendly one, nor it warrantees keeping and preserving the cultural identity and the sense of place (*genius loci*). Identity alone is not an incentive motivation for local population to remain. The poor quality of life, typical of marginal locations, is another driver of abandonment. People need a better quality of life in terms of road connections, good education and cultural opportunities, health services, sporting, recreational and aggregation places.

When tourism is considered as the solution for re-awakening marginal sites, improving quality of life is mainly addressed to new and temporary inhabitants, namely tourists, and does not try to solve problems of local populations. In this sense, re-awakening projects that are locally- and community-led are likely more successful than those led

by 'outsiders' in maintaining the link between past and present and considering semi abandoned villages as authentic places (East 2016; Sloan 2018).

Contemporary and globalised society tends to standardise landscape and sense of place, and to ignore or forget historic and cultural identity. This standardise way of perceiving both the spatial dimension and the landscape is defined by Augé (1995) as *supermodernity*, the consequence of which is the transformation of places in 'non-places'. Non-places are transitory locations, where humans pass through as anonymous individuals but do not relate nor identify with in any intimate sense (typical example of non-places are airport terminals and shopping malls). According to Augé (1995), a non-place cannot be redefined as relational, or historical, or concerned with identity. However, non-places will not supplant places; places and non-places continue to exist and represent opposite polarities: 'the first are never completely erased, the second never totally complete'[1].

A vulnerable environment that deserves particular interest is that defined by Clément (2004) as 'Third Landscape', which includes those spaces between urban and peri-urban areas that are not yet occupied by human activities. As long as these environments are unutilized and left to natural landscape evolution, they can be considered as genetic reservoirs of species diversity (Clément, 2004). On the other hand, if exploited for human activities they will lose any memory of natural and historical identity.

Globalization has a deep impact on community development, town improvement and economic growth; meanwhile it presents several vulnerability aspects that hinder the system adaptation capacity to react to environmental changing and to control citizens' health and safety. The recent COVID-19 pandemic experience clearly demonstrated a transnational system weakness. Urbanization provides economic, social and cultural opportunities that can enhance life quality; on the other hand, sudden changes in urban density and growth can weaken the sense of place (the specific *genius loci*), the integrity of the social fabric, the traditional character of urban areas, and the community identity.

Strategies for increasing resilience of historic endangered towns: a model

In the globalised society, historic centres included in urban areas may lose their social functions, traditional role and populations. A conscious and sustainable restoration approach, and a regeneration strategy carried out together with public administration, may weaken this process and mitigate its impact. Defining strategies for improving the town resilience will contribute to slow down the progressive decline of historical towns and activate regeneration

[1] Augé M. 1995. Non-places: Introduction to an anthropology of supermodernity (London, Verso), p. 79

Tab. 1 features of the selected sites and proposed regeneration activities/ initiatives.

process. The final goal is to reduce migration from small towns towards large cities, to maintain their cultural identity, and to support human communities in their need for balanced development, while enahncing values linked to their history, collective memory, and environment. Cultural heritage plays an important role in programming sustainable urban development. Hosagrahar et al. (2016) propose a new paradigm of sustainable city based on the concept of development in humanistic and ecological terms. According to this vision, conservation projects that include cultural urban landscape conservation and regeneration can contribute to increasing local productivity and to improving well-being of inhabitants (Nocca et al. 2018).

In recent years, the term 'urban resilience' has become an important issue that gave rise to a vast literature dealing with socio-ecological systems and urban sustainable management. According to Meerow et al. (2016), urban resilience is '*the ability of an urban system and all its constituent socio-ecological and socio-technical networks across temporal and spatial scales-to maintain or rapidly return to desired functions in the face of a disturbance, to adapt to change, and to quickly transform systems that limit current or future adaptive capacity*'. Under this perspective, resilience is a dynamic process aiming to reach a desirable state through multiple pathways such as persistence, transition, and transformation. This process should be community-led, thus negotiated among local population (stakeholders) and local authorities.

Here we propose a new approach for contrasting the impoverishing of historic towns, which takes into consideration the different evolution of plant and animal organisms. While the animal organism functions as a unique one, in which single organs are strictly interdependent on each other, plants are modular organisms, where each single part functions independently on the others. In this way, single parts of the plant individual can be removed without threatening the organism survival.

Plants are usually considered as immobile and passive organisms interacting with the surrounding environment for the unique scope to sequester CO_2 for their nutritional needs. However, it has been observed that plants display specific behaviour for manipulating their environment to fit their needs; moreover, plants are able to manipulate animals to realise their reproductive, defensive and surviving strategies (Baluška & Mancuso 2020).

The regeneration strategy we propose tends to assimilate the functioning of small towns and hamlets to the plant organism, i.e. small communities independent on large and globalised societies and characterised by high resilience potential for contrasting unfavourable situations. Opposite to this model, globalisation represents centralised operative authorities that are responsible for the whole country, thus recalling the animal organism

Country	Spain	Portugal	France	Italy
Name	Castaño de Robledo (Huelva)	Terena Parish (Alandroal)	Château de Germolles (Mellecey)	Castello di Riolunato (Modena)
Main past economy	Cultivation of sweet chestnut	Agro-forestry-pastoral system	The estate was devoted to agricultural activities: animal husbandry, wine production and various crops. Since the 1970s, the château has been open to visitors; in 2006, a SME was set up to focus mainly on tourist activities. Cattle breeding continues in the adjacent land.	• Agriculture, handicraft, forestry, animal farming, food processing (parmesan cheese); • SME and advanced tertiary sector
Main cause of abandon	• Decline of agriculture; • Chestnut cultivation threatened by fungal disease; • Lack of economic promotion and planning	• Process of deruralization of the areas; • Unsustainability of traditional economies; • Population aging	• Lack of resources; • Population aging; • Population decline; • Lack of attractiveness	• Population aging; • Lack of economic promotion and planning
Strengths for sustainable regeneration	• Site included within the Sierra de Aracena the National Park Picos de Aroche; • Woods of high value forest species; • Climatic conditions and rainwater richness suited for agriculture, livestock farming and organic farming; • Rich architectural heritage representing traditional building in mud, stone and lime	• Vocation for sustainable tourism; • High landscape heritage value; • Network of rural homesteads and settlements of different chronologies	• Best preserved residence of the Valois Dukes of Burgundy (XIV-XV century); • Well preserved environment; • Since 1989 recognised as National Cultural Heritage	• Site included in Frignano Regional Park (Regional Park of the Modenese Apennines); • Good road connection; • Cultural and historic heritage; • Landscape and natural environment; • Citizen involvement and association; • Esperanto legacy; • Freshwater resources
Proposed regeneration measures	• Improvement of the road network and the connection with the surrounding territory; • Improvement of sustainable agriculture, livestock farming, forestry; • Improvement of Information and Communications Technology (ICT); • Realisation of cultural initiatives for promoting raw material and natural products (fairs, exhibitions, workshops, educational programs); • Valorisation and conservation of traditional building system and heritage through the creation of a professional school	• Integration in the Regional Land Management Plan (PROT); • Urban centers of high heritage value; • Improvement of local employment because of proximity to marble extraction industry of Vila Viçosa and to Alqueva dam reservoir	• Development of novel economic systems (circular economy); • Higher level of inclusion of citizens to the social life; • Improvement of Information and Communications Technology (ICT);	• Improving cultural initiatives through the activities of the 'Scoltenna Academy'; • Improvement of Information and Communications Technology (ICT); • Realisation of cultural initiatives for promoting raw material and natural products (fairs, exhibitions, workshops, educational programs);

regulated by a single operation centre. Considering plants as organisms that can actively interact with the environment to serve their needs could change our way to understand life and better cope with environmental changes (Baluška & Mancuso 2020) and our vision of centralised development strategies.

The Historic Towns Resilience Improvement Cycle (HTRIC), described in Fig. 2, presents a concise snapshot for understanding the process that local governments should undertake for building and improving long-term town resilience.

The cycle begins with encouraging local authorities to achieve early 'wins' by strengthen their internal systems to face and counteract any kind of emergency, from economic crisis to natural disasters (flood, earthquake, etc.). The following steps outline a planning process, emphasise the needs for conservation of architectural structures and management of urban settlement and consider the citizens' quality of life. The cycling path goes on with monitoring and evaluating critical events, identifying risks and defining alert threshold for activating reaction processes or actions. The final step represents the interactive logic of the HRTIC cycle, based on data-driven management and aimed to enhance the resilience to negative events that might occur.

Our model is based on a conscious and sustainable improvement of site resilience involving public administration and citizens by mitigating the impact of globalization process and re-discovering the cultural identity, history and traditions of urban areas, in other words, we propose to diffuse the 'vital resources of the towns' at different levels and contests. Cultural heritage plays a fundamental role for the sustainable development of towns on the verge of abandonment as it can stimulate local population to improve creative activities and to increase social inclusion and cohesion (Nocca & Fusco Girard 2018).

Abandoned, neglected or disused villages and towns require restoration of their integrity in every respect: historic, artistic, architectural, social and cultural. This regeneration strategy should follow sustainable procedures, which requires the detailed knowledge of building material, of monuments and urban vegetation, as well as their decay phenomena. An effective restoration program that warranties long-term conservation and durability requires linking together technical-scientific and humanistic knowledge, it is a complex task related to multidimensionality, heterogeneity and dynamism, which needs to reach the individual's perception and how it turns into a community perspective (Nocca & Fusco Girard 2018).

In order to realize a real regeneration, restoration should not be limited to building recovering and compliance, rather, it should aim at drawing a new cultural and social identity.

This target represents a challenge that should take into account architectural aspects linked to: accessibility, historical and artistic context, as well as economic sustainability including agri-food excellence and specific traits of the territory. The rationale of this strategy is to maintain a balance between historical and landscape features, to avoid isolation of towns, and to promote their employment not only as tourist destination but also as living centres.

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REUSE AS A MODEL FOR THE PRESERVATION OF RURAL ARCHITECTURE

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Rani house today (Anelija Milašinovi).

This paper analyses models for conservation and sustainability of rural architecture by discussing two examples of preservation of vernacular properties. Furthermore, the primary aim is an inquiry into the importance of assigning a purpose and managing the manner of use, which are crucial factors influencing the sustainability of rural architectural heritage. The vernacular fund in Serbia is primarily represented by ground-floor houses built with bundwerk and a filling of wattle and daub, having a simple functional organization. With regards to structure, construction materials and volumetric, rural architecture is fragile, the maintenance is complex and expensive and the properties are not functional as they do not provide the basic comfort of modern architecture. The case study of two buildings, built at the beginning of the XIXth century, Vlajković's house and Rančić's house in Grocka, a suburb of Belgrade in Serbia, prompts a discourse on priorities in preserving the rural construction fund.
Vlajković's and Rančić's houses were and represent typical examples of vernacular architecture of central Serbia. Both of the properties are cultural monuments and were chosen as a case study for the comparative analysis because they both have recognized monumental values, are under protection, and are owned by local communities but they are in completely different states. By analyzing the similarities and differences in the two approaches to the protection of these buildings, the paper tries to support the model of preserving folk architecture in a semi-urban environment, which is centered on a change of purpose of the properties from residential to public, but also in raising awareness of the local community.

Keywords: vernacular heritage, Grocka, reuse, change of purpose

Introduction

Vernacular architecture, which represents a reflection of the collective memory of the local community and the region, their span, history, beliefs and their interrelation with the environment, is being increasingly threatened by the accelerating urbanization.
Although they form an inseparable continuity of tradition and history of a place, the material and intangible values of folk architecture are often not sufficiently recognized by the local population, which views them as an obstacle for economic development. The recognised

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Fig. 1
Panorama of Grocka(https://tamoiovde.wordpress.com/2017/01/26/grocanska-carsija-srce-stare-varosi-kraj-dunava/#jp-carousel-34443).

Fig. 2
Grocka main street before the II World War (Documentation of Cultural Heritage Preservation Institute of Belgrade).

cultural monuments of folk architecture are protected by law from demolition and replacement with new buildings, but not from abandonment, which inevitably leads to collapse and disappearance.[1] The necessity of a multidisciplinary approach which, in addition to the conservation of the physical structure, unites the contextualization of the monument through integrative inclusion in the modern way of life, opens the possibility for a sustainable life of the monument. The objective of this paper is the identification of a model for conservation and sustainability, using two examples of representative residential buildings from the 19th century, the Vlajković house and the Ranković house, both in a semi-urban environment.

History of Grocka

The administrative area of Belgrade, the capital of Serbia, is made up of seventeen municipalities that stretch from the heart of the city to the suburban regions. The city's large territorial distribution, which is additionally topographically intersected by two rivers - Sava and Danube, means that it consists of urban zones, semi-urban areas and rural areas with their cultural specificities. The diversity of each of the seventeen municipalities, conditioned by the dominant economic activity, influenced the formation and development of the construction fund. Among the municipalities, Grocka, positioned along the right bank of the Danube, 25 kilometres from the city centre, occupies a special place (Fig. 1).

Traces of settlements in this area date back to the beginning of the Neolithic era, as indicated by many material traces which were found there, belonging to numerous communities spanning from the ancient period, which is told by the rich material remains of rustic villas to medieval settlements.[2] First extensive written accounts of a settlement

[1] Zakon o kulturnimdobrima, "Službeni glasnik Republike Srbije", br. 71/94.
[2] The Austrian researcher, Felix Kanitz, mentioned Grocka in his records as one of the once important Roman points on the Danube, within the Upper Moesian Danube Limes. Grocka is also mentioned as a settlement in the 9th century under the Slavic name Gardec: documentation of the Institute for the Protection of Cultural

appear in sources dating back to the first half of the 16th century when it carried a Turkish name Hisarlik. This urban area was constructed on the old Constantinople road, which connected two major cities built on the Danube river, Belgrade and Smederevo, which influenced the development of the fortified Turkish province. Over time, it developed into the centre of Gročanska, and then of the Belgrade Nahiyah.[3]

The favourable geographical context of the area contributed to the development of trade and crafts, which provided economic prosperity in the 19th century. In addition to trade, the citizens of Grocka engaged in agriculture, primarily fruit growing (especially viticulture), fishing and livestock farming. Live trade and developed agriculture conditioned the formation of the oriental bazaar[4] - the centre of the settlement where the trade of goods took place. The Gročanska town consisted of the main street with a series of shops, craft shops, administrative buildings and residential building (Fig.2).

Today, Grocka, as one of the suburban municipalities of modern-day Belgrade, still represents an area which is between a city and a village in terms of its structure. However, the primary industrial activities in the area have changed, and the inhabitants are starting to gravitate towards the city centre. On one hand, due to the proximity of a large urban city centre, there is no danger for the region being completely abandoned, as is the case in more isolated areas and villages. However, new modern buildings and collective housing are being built at the expense of folk architecture, which is lost, completely changing the urban matrix. In the town and within its immediate vicinity, several large and inappropriate architecture has been built, which is inconsistent with the standards and the character of the entire historical ambience. There is insufficient awareness, within the local community, of the importance and value of folk architecture as opposed to urban development and profit, leading to a rapid destruction of the existing fund. However, as Grocka managed to preserve some of the previously mentioned features,[5] it was pronounced an area of great importance, due to its architectural, social and cultural-historical significance.[6] The former main street is still the centre of Grocka and with its architecture and scenery, it still offers an opportunity to experience the former ambience, which represents the work of folk builders.[7]

Monuments of the City of Belgrade: Каниц, Феликс Филип, Србија, земља *и* становништво *:* од римског доба до краја XIX века. *1 и 2*, Српска књижевна задруга, Београд (1987).

[3] Grocka gained a more significant administrative and political position during the period of Austrian rule1717-1739:Петровић, Ђорђе. Старакућа *у* Гроцкој, Универзитет у Београду, Зборник Архитектонског факултета, Свеска 4, (1957.) 1-3.

[4] Ibid.

[5] Атић,Зорица.Топлина варошког дома Гроцке, Грочанска чаршија *и* Ранчићева кућа, Центар за културу Гроцка (2019), 26.

[6] Решење Завода за заштиту споменика културе града Београда бр. 470/4 од 12.05.1966. године (rescript of the *Cultural Heritage Preservation Institute of Belgrade* no. 470/4 of 12.05.1966); Службени гласник СРС бр. 14/79.

[7] Живковић, Н. „Грочанске куће – парадигма времена“, Наслеђе XII, Београд 2011, 267-279.

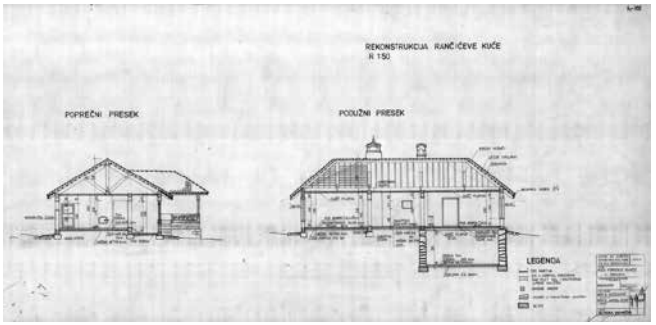

Fig. 3
Drawing of Rani house (Documentation of Cultural Heritage Preservation Institute of Belgrade).

Fig. 4
Rani house before restoration around 1970 (Documentation of Cultural Heritage Preservation Institute of Belgrade).

Vernacular architecture in Grocka – Morava type house

What is specific about Grocka is that it was simultaneously a small town and a village, therefore there are two different dominant types of architecture in the area: the old village and the old townhouse. Although different in appearance, with regards to the spatial organization they share common characteristics of Moravia type houses.[8] They are characterized by well-thought-out macro and micro-locations with the town and economic activity, a small number of rooms and the construction of additional buildings on the plot. They are built from the locally available materials,[9] bundwerk and a filling of wattle and daub.[10] Each house was constructed on a stone pedestal built from dry stone, which often reached the height of one floor. The basic spatial organization consisted of two units - one room in which a fire was always burning, that is, a room with a hearth (chimney) and another room in front of which there was often a porch.[11] Depending on the representativeness of the house, it could be designed to have more rooms grouped around the central hearth room. The entrance into the house was usually through a wooden porch, which represented an intermediary between the interior and the exterior of the house. Floors inside the house were made of packed earth with the addition of limestone. The floor to ceiling height was extremely small, between 230 and 250 centimetres. Well-designed houses were characterized by a thoughtful orientation towards the sun, so that despite having small and low windows the space within the house was always well lit.[12] There was also a careful consideration of the size of the garden and the layout of auxiliary buildings in it, which were an inseparable part of the design (Fig. 3).

[8] Пешић Максимовић, Надежда. Моравска кућа Србије, богатство облика, Друштво конзерватора Србије, Београд (2014), 33-36.
[9] Којић, Ђ. Бранислав. Стара градска *и* сеоска архитектура *у* Србији, Просвета, Београд (1949) 10.
[10] Ibid.
[11] Петровић, 1957: 3-5
[12] The windows are about 80/70 cm in size.

The architectural organization of the space was a direct representation of the way of life of a rural family, their beliefs and traditions. Even though the architectural elements of the houses were modest and simple, they all carried symbolic meaning. For instance, one of the often-neglected architectural elements is the threshold, which symbolizes trouble, and it is believed that the threshold should always be stepped over, never trampled.[13]

The old townhouses in Grocka were created based on the village houses, but with more complex spatial organizations and decorative design.[14] With their richness of architectural expression and ethnographic values, they are rare examples of well-preserved folk architecture on the territory of Belgrade. Within the entire area of the city, Grocka has the highest number of preserved free-standing townhouses. They are businesses and residential buildings built in the bazaar alleys, in the area where there used to be the houses of the wealthier families. Even though they were protected as cultural heritage, many houses underwent major transformations intending to meet the basic needs of the inhabitants. According to the available data, the creation of the most important buildings is estimated to have happened in the last decades of the 18th and the first half of the 19th century. For the layout of the rooms, the townhouses in Grocka belong to a group with a prominent covered-balcony, of the asymmetrical type. The face of these houses is placed towards the yard of the house is pulled from the street into the depths of the garden.[15] It was built in a bundwerk construction with a skeleton of oak beams and a filling of wattle and daub, and the foundations were made of hewn stone. The roof outlets reach a width of more than one meter, and in addition to the function of protection from rain, they symbolically signify the wealth and reputation of the family. A house like this consisted of four or more rooms that were strictly defined: a chimney, a living room, two bedrooms, a basement and a porch that extends in the corner towards the balcony.[16]

Rančić's and Vlajković's houses are preserved to this day and they represent two examples of typical old townhouses in Grocka. Built at the beginning of the nineteenth century, they are characteristic representatives of vernacular architecture of central Serbia and today they are a part of the national cultural heritage.

[13] Пешић Максимовић, Надежда. Моравска кућа Србије, богатство облика, Друштво конзерватора Србије, Београд (2014), 104.
[14] Атић, Зорица. "Настанак и развој грочанске чаршије и студија случаја Ранчићеве куће у Гроцкој", Годишњак града Београда, Кн. LXV (2018), 199.
[15] Петровић, 1957: 7
[16] Атић, 2018: 204.

Fig. 6
Vlajkovi house around 1970 (Documentation of Cultural Heritage Preservation Institute of Belgrade).

Fig. 7
Vlajkovi house today (Andjelija Milašinovi).

Rani's and Vlajkovi's houses – a change of purpose or degradation

Rančić's house is found on the left side of the Gročica river and Smederevski road,[17] on a hill which descends towards the Danube, in a part of Grocka which represents the oldest regulation of today's town, built around the Carigradski road.It was built in a former town alley, as a ground-floor house of the Morava type,[18]but it was significantly remodelled, in line with the typical design of a townhouse, around the year 1830 (Fig. 4). The interior layout of the rooms and the exterior appearance with the main façade facing the garden are categorized as a characteristic representative of the Grocka type.[19]

It is characterized by a high class of construction, housing and art of its time. Due to its architectural, ethnographic, social and cultural-historical values, this house was of special importance not only for the local community but also within the wider national context.[20]The first conservation and restoration works were carried out in 1970, and the purpose of the house was changed when the Local Museum of Grocka with the archaeological collection of Dr Aleksandar Kostić from the Dubočaj site was relocated there.[21] The

[17] The house is located at Majevička no. 9, Grocka
[18] Живковић, Н. Ранчићева кућа, Београд 2013, 4.
[19] Живковић, 2013: 5.
[20] It is protected by the Republic of Serbia as a cultural monument of great importance. Решење Завода за заштиту споменика културе града Београда бр. 525/4 од 27.06.1966. године (rescript of the *Cultural Heritage Preservation Institute of Belgrade* no. 525/4 of 27.06.1966): Службени гласник бр. 14/79.
[21] Античко налазиште.

museum was located in the house until the beginning of the new millennium and the next conservation and restoration work. However, the museum did not have a large number of visitors, the building fell into disrepair over time, so in 2000, extensive work was carried out to repair the damage, when the immediate surroundings of the house - yard were arranged, which contributed to restoring the original ambience. The Grocka Cultural Center, a newly established cultural institution founded by the municipal administration, became the user of the house in 2008,[22] and with its rich program activity, it records a large number of visits and interest from visitors. In addition to the house, in the summer months, a spacious garden is used as a music stage, space for workshops and an open-air gallery.[23] The needs of the centre, which has two employees, did not require any intervention in the basic structure of the building, and what would be negative elements for a living space, have their advantages for the centre, such as a toilet that is located outside the main building (fig. 5).

With the excellent choice of purpose and the commitment of the employees in the cultural centre, the community got a new place with cultural and educational content, and the house was included in the social and cultural life of the local community and beyond, which contributed to creating a sense of belonging and pride in the local community. as well as the recognition of the need to preserve the existing fund.

[22] Атић, 2019: 68.
[23] Ibid 69.

Vlajković's house[24] was built in the same period as the family house of the captain of the Gročanska Nahiyah.[25] It was constructed on a large plot, on the left side of the river in an alley at the very beginning of the town. It was built in a bundwerk construction with a wattle and daub filling and it had a slightly more spacious layout, which consisted of six rooms, a basement, a porch and a covered balcony.[26] It is easy to see the elements that make it a typical townhouse: the number of rooms, the logical layout and differentiated spaces, the decoration based on the social status and the means of the original owners. It is well visible from Smederevski road and is a visual symbol marking the beginning of the town. Due to its overall values: architectural, ethnographic, historical and cultural, it has been classed as a cultural monument.[27] In an attempted to preserve this monument of vernacular architecture as Ranković's house, this house became state property in the 1960s (fig. 6).

However, unlike Rančić's, Vlajković's house was abandoned and today it is a cultural monument which is disintegrating.[28] As the occupant of the facility - the municipal administration of Grocka did not recognize its potential, and since revitalization would represent a large financial expense, the house is inevitably degrading. Little by little, an illegal building was built on the plot of the cultural monument, and the house itself is now used as a place for waste disposal (fig. 7).

Seeing as the documentation is very well preserved, with the initiative of the owners of the municipality of Grocka and the professional help of the service for the protection of cultural monuments, this house could be very easily reconstructed. However, the reconstruction and rehabilitation of the facility alone will not solve the problem of its further survival. Considering the successful revitalization of Rančić's house, the municipality became interested in revitalizing Vlajković's house, primarily due to the positive reaction from the local population, which recognized that cultural heritage makes Grocka unique and special and that it puts them on the cultural map of Belgrade. In that context, the protection service is expanding its scope, trying to use a multidisciplinary approach with the help of the cultural centre to helping the municipality devise the most adequate way of use that would promote the sustainability of the house. Several solutions have been proposed to the municipality and there is interest in preventing the monument

[24] Води се на адреси 17. окробра бр. 8, Гроцка.
[25] Живковић, Нада. Народно градитељство – споменик културе данас, Завод за заштиту споменика културе града Београда (2007), 50
[26] Документација Завода за заштиту споменика културе града Београда
[27] Решење Завода за заштиту споменика културе града Београда бр. 605/1 од 30.06.1966. године (rescript of the *Cultural Heritage Preservation Institute of Belgrade* no. 605/1 of 30.06.1966).
[28] Живковић, 2011: 277.

from collapsing. The attractive location of the building at the very beginning of the town opens the possibility of using it as a tourist centre of the municipality. The spaciousness of the house allows organizers of various cultural and educational events to use a part of the house as a gallery space. An office for young local community centres could also have its corner.

These two examples of vernacular architecture indicate that the recognized values of architectural, historical and cultural significance by professional protection services have no significance without the establishment of a broader more integrative framework that employs the contextualization of monuments in a specific socio-economic sphere. Without establishing the connection between the local population and the material cultural heritage, developing a sense of belonging and uniqueness, it is impossible to achieve the sustainability of this fragile segment of heritage. Residential buildings that have been abandoned over time due to various socio-economic reasons, can be revitalized, given a new life with their value emphasised perhaps even becoming centres of the collective memory of a place.

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TRADITIONAL SPANISH ARCHITECTURE "ON THE EDGE": AN ANALYSIS OF BENCHMARKS RELATED TO CONSERVATION POLICIES

Camilla Mileto, Fernando Vegas, Valentina Cristini, Lidia García
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Example of buildings greatly abandoned due to changes in ways of life, the depopulation of rural areas, the lack of social recognition (Calatañazor, Soria), by F. Vegas-C. Mileto.

The so-called "demographic challenge", linked to depopulation and/or aging of rural populations, has become one of the most important questions facing European society. This process, which basically affects most of the rural areas in Spain, has worsened in recent times, reaching a critical situation in specific spots of the country. A map of constant depopulation is increasing in marginal and isolated territories and, at the same time, this phenomenon can also be seen in isolated coastal tourist destinations such as islands, depending on the season. A set of Spanish case studies, mainly related with rural inner or Mediterranean sites are at present being analysed by the authors in the framework of two different research projects on traditional architecture, conservation strategies and social risks. The studies have been undertaken in the framework of "RISK-Terra. Earthen architecture in the Iberian Peninsula: study of natural, social and anthropic risks and strategies to improve resilience" (RTI2018-095302-B-I00), funded by the Spanish Ministry of Science, Innovation and Universities. In addition, interesting examples have been analysed in the framework of "VerSus+, Heritage for PEOPLE" (grant 607593-CREA-1-2019-1-ES-CULT-COOP1). In both cases an important aim of the research is to enhance new perspectives and opportunities on the basis of best practices, simultaneously analysing tourism as a threat and an opportunity for conservation strategies. For this reason a global review of crucial stakeholders such as local administrations, craftsmen, building enterprises, visitors, tourists and local communities has been undertaken. Purely social aspects and k-factors (such as abandonment, depopulation and temporary living) have been cross-referenced with more strictly architectural and conservation parameters. In this context, models of action are presented to help to control the depopulation process by applying sustainable development models and fostering cooperation and entrepreneurship. These examples should serve as a real testing ground for the implementation of actions for social participation, dissemination, education, communication and promotion in different contexts and through different media. The result of the methodology study will also have later repercussions throughout the region and throughout other possible similar scenarios. In addition, promotion and support from associate project partners will make it possible to apply these experiences in other similar European and international contexts.

Keywords: Mediterranean Architecture, Earth Architecture, Preservation Tools, Sustainability

Introduction: the reasons for the study

The term "resilience" has been used in architecture in numerous ways, especially over the last decade. In short, it is defined as the capacity (of a subject/object) to be rebuilt and recovered after undergoing trauma or accident, usually unforeseen (AA.VV. 2014). Thus, it differs significantly from resistance, as it also focuses on incorporating more in-depth concepts

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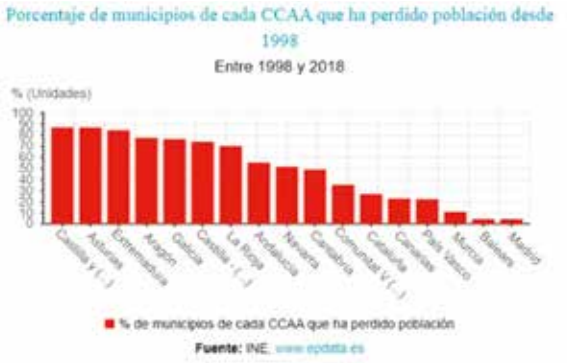

Fig. 2
Analysis of the changes in the population distribution: percentage of regions that have lost population in Spain, between 1998 and 2018. (ei: 85% of villages of Castilla and Asturias has left population) (INE, www.epdata.es).

such as adaptability and potential recovery at a later stage. In ecology, resilience tends to be linked to the capacity of an ecosystem to respond to a disturbance, resisting damage and swiftly adapting when faced with an obstacle. In conservation, actions which take into account the resilience of historic architecture, recognizing it from a territorial to a detailed scale, can result in different methodological approaches (Mileto et Al. 2020). The starting points for the research projects presented here by the authors are the prediction and investigation of possible scenarios in the use of buildings or fragile enclaves in situations of abandonment, crisis or threats which could challenge the integrity of the historic built centre and its occupants. These two projects, "RISK-Terra. Earthen architecture in the Iberian Peninsula: study of natural, social and anthropic risks and strategies to improve resilience" (RTI2018-095302-B-I00) and "VerSus+, Heritage for PEOPLE" (grant 607593-CREA-1-2019-1-ES-CULT-COOP1), aim to research adaptive structures and materials which can "learn" from their surroundings and be constantly reinvented. The objective of the former is to provide a scientific overview of the study of social and anthropic natural threats, as well as examining mechanisms of deterioration and the dynamics of transformation currently affecting earthen architecture in the Iberian Peninsula (webriskterra 2020). The latter aims to research vernacular heritage as tangible and intangible heritage, paying special attention to the mechanisms and dynamics for the protection, valorization and dissemination of authentic aspects of traditional architecture in selected Mediterranean islands. It focuses on architecture resulting from the practical experience of local residents, using local materials for construction and taking into account climate and geography while also developing cultural, social and constructive traditions based on the natural conditions and surrounding habitat. Both studies are linked

to historic architecture and potential methods for its conservation and valorization, considering tourism-related social policies and user actions to be key aspects for study. Among these it is worth noting the inhabitants of rural or island areas who look after and live in traditional architecture, although at times the relationship between these is partial, intermittent, inappropriate or even based on oblivion, as the analyses below show (Fig.1).

The demographic challenge in relation to traditional architecture and tourism in Spain

The depopulation and rural exodus which have affected numerous regions in Spain in recent decades are linked to aspects such as the crisis of the traditional agricultural system and overall social changes and "social modernization" (referring to the advances in Spanish society between the 1960s and 80s) (Alfonso Camareno 1993).

However, the population system crisis could be closely and directly tied to the technological revolution, particularly to means and systems of transport. The phenomenon affecting many of the smaller rural nuclei could be explained by the great contrast between an inherited population system which has adapted to technology and overcome necessities and an updated 20th and 21st century technological system with updated transport and communications (Micle 2014).

In many population nuclei (and municipalities) this has given rise to a serious imbalance in the population system, with population increasingly dwindling. Furthermore, these imbalances tend to increase, impacting negatively on the smaller rural municipalities. Thus, the most recent data highlight how barely 6% of the Spanish population lives in municipalities of under 2,000 inhabitants. This accounts for 72% of the municipalities and 55% of the surface in Spain. The average density of these municipalities is under 10 inhabitants/km^2. (Ceddar, Centro de estudios sobre la despoblación y desarrollo de áreas rurales 2020).

A quick analysis of the changes in the population distribution between 1998 and 2018 (Frutos et Al. 2006, Ceddar 2019) results in two major conclusions. Firstly, population in rural municipalities has continued to decrease (even when the flow of migration has partially improved the situation in some rural areas). Secondly, these losses are not unique to the smaller municipalities and can also be observed in municipalities of up to 20,000 inhabitants (Fig. 2).

This clear continuity of the readjustment process of the demographic effect on the system of population nuclei leads to a series of reflections within the framework of the Risk-Terra and VerSus projects, suggesting the need for an approach linked to the loss of constructive know-how, lack of maintenance and conservation of the traditional architecture of these sites.

Fig. 3
Sesga - Valencian Commuity as a representative village of "Empty Spain", by C. Mileto.

Fig. 4
Traditional architecture in selected Mediterranean islands, study by F. Vegas-C. Mileto.

Case studies and parametric analysis: rural exodus

Exodus is a concept which involves a spatial dimension, the abandonment of individual enclaves or nuclei. Over the last 50 years especially, all the regions in Spain, except Madrid and the Basque Country, have recorded a gradual decrease in population (natural population change, the difference between births and deaths, and net migration, the difference between those entering and leaving Alfonso Camareno 2000). Population decreases are always greater in more rural municipalities. This is clear in the most affected provinces, such as Guadalajara, Soria and Teruel, and in other rural regions such as Extremadura and Galicia. In municipalities with lower population the demographic decrease is greater. This process is still going on in some municipalities which have been unable to recover from the rural exodus of the 1950s and 60s which still continues. Against this backdrop the Risk-Terra project aims to focus on the most affected areas (especially the "triangle" of the provinces of Guadalajara, Soria and Teruel, representative of "Empty Spain" Fig.3) where the factors to be taken into account in the analysis of case studies focus on different constructive techniques which use earth and on the alarming rural exodus. In these cases the authors focus on three main study parameters: identifying the functional obsolescence of buildings; quantifying the loss of technical know-how (covering the cycle of constructive techniques, from extraction to execution of the different traditional materials, especially earth); and identifying the loss of tangible and intangible values in rural nuclei (Mileto et Al. 2019). (Fig.3)

Case studies and parametric analysis: depopulation in the islands

Depopulation is defined as the loss of effective inhabitants in an inhabited nucleus, without it becoming uninhabited. This phenomenon can be measured quantitatively and unlike exodus does not involve a spatial dimension (Calvo Et al.2002). In contrast to exodus, depopulation is especially visible in tourist locations in Mediterranean Spain, where

there are high variations in population figures depending on the seasons of the year. In fact, one of the driving forces of the economic development and opening up of Spain to other countries was the continued influx of foreign tourism on the coast. This resulted in the loss of most of the traditional architecture in many locations (former fishing towns, artisans' nuclei, preindustrial infrastructures linked to the exploitation of resources in coastal areas …Fig.4). However, this developmentalism which resulted from Spain joining the list of capitalist and democratic countries in the West has barely reached the islands, where it has had a minimal effect, particularly in the case of some of the smallest ones, such as Formentera in the Balearics. Tourism reached Formentera decades after it reached the rest of the country, and its effects were far less noticeable so that the island now conserves an extensive catalogue of traditional buildings and infrastructures (Mileto, Vegas 2017), which have been updated and maintained by a thriving community of professionals (artists, developers, politicians, managers etc.). In these cases, the authors also focused on the definition of three main parameters for study: the level of permeability of the island, establishing a distinction between imported and autochthonous factors (constructive techniques, resources, products…); the study of the habitat, highlighting seasonal depopulation and changes in housing (traditionally isolated, inward-looking, local …) (Aicín, Pinilla 2000); and protection mechanisms (apart from regulations), analysing the dynamics for access, parking, boarding/disembarking, visits, stays, costs and toll fees.

Conclusions

The projects examined, still at the development phase, aim to contribute to strategies to control depopulation and exodus. The data obtained show that the direction and intensity of this process can no longer be ignored, while the two projects presented along with their strategies propose territorial models, placing special emphasis on the tangible and intangible values of traditional techniques and architecture. In addition, the projects aim to use these strategies to help the relevant authorities and different stakeholders in each territory, focusing their attention on the debate on the true role of rural architecture within the territory, both in the mid and long term.

In this debate projects help to identify the "line of defence" in the population system for each area under study. This identifies the nuclei which must concentrate efforts to retain population in a stable fashion (or attract it from outside if necessary) providing all the elements to guarantee a level and standard of living comparable with the rest of the country (Ayuda et al.2005). (Fig.4)

Defining this "line of defence" for the case studies mentioned does not imply abandoning less sustainable (or viable) population nuclei to their fate. Formulas should be implemented to encourage entrepreneurship and lines of conservation, recognizing that these are not global solutions nor are they likely to halt the depopulation of the most vulnerable nuclei in the medium term (Pinilla et Al. 2013).

Finally, the projects stress the fact that a continued depopulation process in the low-density areas analysed does and should not involve ceasing activity (Moyano et Al., 2013). The transport and telecommunications technology referenced earlier now makes it possible to maintain activities in low-density rural areas while allowing some flexibility in the relocation of the population, possibly partly to larger nuclei. These could perhaps be the lines of defence for the rural population and its architecture.

Rural accommodation in Spain increased by almost 30% in the last decade (Fitur 2019)., while domestic tourism grew by 60%. Given these figures, and as over half of the rural tourism offer is managed by women, this sector has become a key tool in halting exodus and depopulation.

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NEW TOURISM MODELS AS A MECHANISM FOR THE CONSERVATION OF CULTURAL HERITAGE: THE CASE OF CÁDIZ

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Universidad Politécnica de Madrid-España

Situation of the city of Cádiz within the Bay of Cádiz. Source: Wikipedia, Bay as seen by Sentinel-2, European Space Agency.

Tourism is a very dynamic sector worldwide whose development is characterized for the expansion and diversification of the tourism models. This generates both positive impacts on the economy and society, as well as negative ones. These last ones derive from the tourist pressure to which urban networks are subjected and which can lead to gentrification processes. Thus, new systems for renting out housing as tourist accommodation are being positioned as an alternative to regulated accommodation (hotels, hostels, and apartments).

In cities with a high presence of heritage, tourist housing is usually the result of rehabilitation actions in historic buildings that have poor living conditions and a high degree of abandonment. This is the case of the municipality of Cadiz (Andalusia, Spain). Considered the first city in the West, it has a vast heritage, both tangible and intangible. Heritage that local policies have made available to tourism.

Given the current situation, the need to change the prevailing tourism model is becoming more and more evident. It is necessary to search for mechanisms through which tourism can be recognized as an opportunity sector while protecting heritage. Therefore, this research proposes to analyse a current problem, the degradation of the cultural heritage of the urban centres together with the phenomenon of tourist gentrification. The objective is to establish the effects that comes from the implantation of the tourist housing in consolidated urban networks with high patrimonial presence, linking it to the level of tourist load.

Keywords: Spain, Andalusia, Tourism, Cultural heritage, Cádiz.

Introduction

Tourism is a very dynamic sector worldwide whose development is characterized for the expansion and diversification of the tourism models (Nieto González & al., 2016, p. 129). Tourism generates positive impacts such as employment creation and social cultural exchange. However, as it is unevenly distributed, it gives rise to territories that are subject to significant pressure that leads to changes in both the social model and the urban structure. These changes can cause gentrification processes where the residents are expelled from their neighbourhoods.

Within this context, new systems for renting out housing as tourist accommodation are being positioned as an alternative to regulated accommodation (hotels, hostels, and apartments) (Ortuño & Jiménez, 2019, p.9). These are residential units owned by non-professional

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individuals in the sector who offer accommodation for short periods of time. They are known as *Houses for Tourist Purposes*.

In cities with a high heritage presence, such as the municipality of Cádiz (Andalusia, Spain) which is the case of study, tourist housing is usually the result of rehabilitation actions in historic buildings that, despite being able to settle important cultural values, in many cases present poor conditions of habitability and a high degree of abandonment. This new use of local built heritage represents an opportunity for recovery, but it also implies an inherent risk of loss of value. By making heritage available to the tourism sector, it tends to fall into a trivialization of heritage, where the historic centers of the cities come closer to the "theme park type" (Pastor Alfonso, 2003, p.109).

In this sense, given the new demands of the tourism sector, the defining elements of heritage (understanding not only the built, but also the intangible heritage; customs, parties, etc.), end up transforming into the "scenario" where the action of this "game" takes place (Valcuende del Río, 2003, p.99) in which cities are forced to reinvent their models to face other more exotic destinations. Therefore, poor management of cultural tourism jeopardize the survival and identity of the most mature tourist destinations, whose cultural heritage is deteriorating rapidly.

Today, competition in the tourism market is becoming so intense that the possession of natural and cultural resources are one of the conditions for the development of tourism, but they are not sufficient for positioning in the market as a competent destination (Boudiaf - Mekky, 2016, p.3).

Parallel to the development of tourism, it is necessary to add that the current model of urban growth, in Spain in general, has become unsustainable and has favored the increase in consumption of natural and energy resources, well above the increase in effective levels of real development. This clearly contrasts with the worsening of some basic components of urban quality of life (Ortiz, 2017, p.106). For this reason, we must put an end to this model and look for patterns of urban growth that improve current living conditions and do not compromise the well-being of future generations. Sustainability should not be a "passing fad", but rather as a requirement of the new challenges and global rules of competitiveness (Fernández & Gutierrez, 2013, p.122).

In addition, in view of the current situation, the consequences of the COVID-19 outbreak cannot be set aside, some them are already beginning to be visible. On 11 March 2020, WHO (World Health Organization) declared COVID-19 as an international health emergency pandemic (Marques Santos & al., 2020, p.8). The tourism sector is one of the most affected by this situation. This is due, on the one hand, to its dependence

on mobility (national and, above all, international) and on the other hand, to the physical proximity involved in tourism activity by the relationship between service providers and customers (GTMC, 2020, p.27). In addition, tourism involves many sectors of activity such as hospitality, catering, commerce, real estate, transportation, leisure and culture. Among them, the tourism accommodation and air transport sector, they have no more business options than tourism. Therefore, since the closure of all activity in spring and the impossibility of teleworking, the tourism sector has been more exposed to confinement measures than any other industry (Marques Santos & al., 2020, p.8).

Looks like the situation is not going to recover in the short term. Therefore, rethinking the business model, investing in innovation and digitization and creating a regulatory framework with a focus on sustainability seem to be the guidelines to follow for the creation of a more inclusive and sustainable long-term tourism model (World Tourism Organization, 2020).

Objective-

This research proposes to analyse a current problem, the degradation of the cultural heritage of the urban centres together with the phenomenon of tourist gentrification. The objective is to establish the effects that comes from the implantation of the tourist housing in consolidated urban networks with high patrimonial presence, linking it to the level of tourist load.

The methodology followed is the analysis of the characteristics and the impact of tourism activity in these areas, comparing it with the tourist carrying capacity of the place and its adaptation with the sustainability standards.

Tourist housing and carrying capacity

In 1980, Butler developed a Tourism Area Life Cycle Model (TALC). This model suggests that the pattern of development of most resorts goes through a series of stages ranging from exploration to stagnation of the destination in question, followed by a series of possible outcomes (rejuvenation, reduced growth, stabilization, decline or immediate decline) (Butler, 2014, p.203). This is an evolutionary and dynamic model, which reflects the change that occurs in the tourism sector over time.

According to Butler, the decline of the tourist destination is linked to the massification and consequent improvement of the carrying capacity (Butler, 2014, p.213). The excess of visitors seems to have a negative impact on social and economic continuity (Van der Borg & al., 1996, p.320). This situation is especially negative in the case of heritage cities, as is the case of the municipality of Cadiz, where not only the vitality of the local economy but also the integrity of the heritage and the quality of life of the residents is threatened. In these cases, it

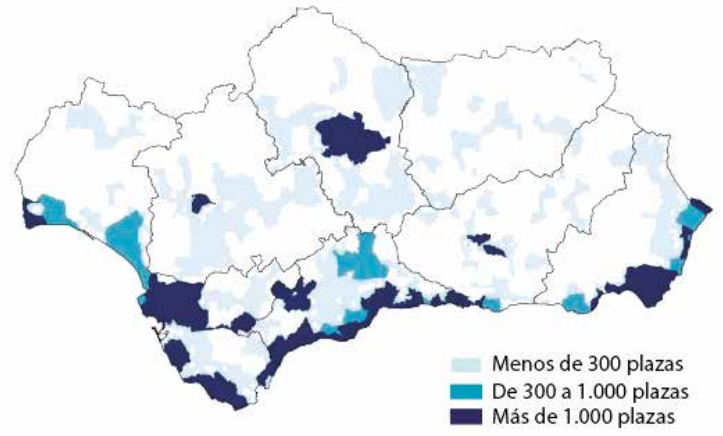

Fig. 1
Municipal distribution of accommodation places offered in Houses for Tourist Purposes, year 2018. Source: Ministry of Tourism, Regeneration, Justice and Local Administration, Junta de Andalucía (2018). Tourism in rented housing in Andalusia.

seems necessary to implement management strategies that focus on the control and orientation of visitor flows.

The current situation is dominated by the power of large investors, the lack of public policies promoting sustainability, the absence of management processes and tourism planning, both in the public and private spheres (Sánchez Valdés & al., 2017). To this is added the obsolescence of much of the tourist offer. However, the characteristics are particular to each geographical space. It is therefore difficult to establish general rules of action aimed at mitigating the negative effects of a poorly managed tourism model on consolidated urban plots. Moreover, the carrying capacity of each destination depends on a number of factors that are determined by the type of tourist, the resources available to them and the country to which they belongs, so the absolute capacity of the destination will depend on its particular circumstances.

This method of planning allows, in addition to assessing the impact of visitors and tourist activity, to highlight aspects related to the management and conservation of the values of the site (Alvarez, 2010, p.242), referencing to its evolution in time. Tourism is a changing and diffuse activity in time and space (Echamendi Lorente, 2001, p.28). Therefore, it is important to monitor and control the validity of the measures that are implemented in a tourist destination.

The carrying capacity of a tourist destination is determined by the level that when exceeded generates negative factors. While for Butler the main indicator of the model is based on the quantification of the number of visitors, in 2001 Johnston introduced a new variable; tourist accommodation units as a tool to measure the maturity of the destination

(Sánchez Valdés & al., 2017). In this way, the quantifiable part of the reception capacity of historical tourist cities can be determined by the ratio between the number of bed seats and the total population.

The "saturation of accommodation", or exceeding the carrying capacity, occurs when the consolidated urban fabric that makes up a tourist city has been surpassed by tourist accommodation (Simancas Cruz, 2019, p.5). "Accommodation density" is used as an argument when congestion reaches levels that cause the tourist destination in question to reach the state of decline that Butler spoke of when referring to the life cycle of tourist destinations (Simancas Cruz, 2019, p.9). This saturation and the consequent state of decline are driven, in part, by the current tourism model, which is based on continuous growth. In short, it is about achieving optimal capacity without saturation.

Case study: Cadiz

The municipality of Cádiz, located on the "Costa de la Luz", on the coast of southern Spain, in the Comunidad Autónoma of Andalucía, is chosen as a case study. Considered the first city in the West (Parodi Alvarez, 2016), it presents geographical and cultural characteristics that, together with its vast heritage, make it a tourist destination of international interest. However, its insular character and lack of land make it a fragile city when faced with the demands of the current tourism model.

Since the autonomic regulation of the tourist housing in 2016 (Junta de Andalucía, Boletín Oficial de la Junta de Andalucía, 2016), and as a result of the tourist boom that the municipality of Cádiz has experienced, the city is now facing an unstoppable growth of this type of rental housing (Fig. 1). Local urban policies have made the territory, heritage and infrastructures of the municipality available to tourism, not limiting the growth of tourist housing, especially in the Historical Centre.

This situation is linked to the processes of gentrification and touristification that are taking place in the city and affect the quality of life of its inhabitants. In this sense, it is considered necessary to regulate and control the expansion of tourist housing. The lack of guidelines emphasizes the conflict between the rights of tourists to travel and the rights of the population, which particularly influences those sectors of the population that are not involved in tourism activity, and therefore only perceive the negative effects of "tourist overpopulation" (Simancas Cruz, 2019, p.4). This last concept is linked to the consequences of touristification.

Although tourist use is already regulated by local authorities, what is being considered here is the need to define policies that include new approaches to guarantee the control and generation of positive impacts on the city. Monuments and historical areas have always been vulnerable zones due to threats of human invasion (vandalism and over-industrialization), as

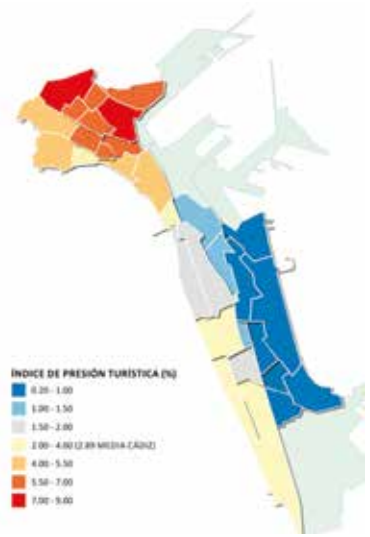

Fig. 2
Situation of the city of Cádiz within the Bay of Cádiz. Source: Wikipedia, Bay as seen by Sentinel-2, European Space Agency.

Fig. 4
Aerial view of Cadiz's old town. Source: https://conocespain.com.

well as in terms of their fragility towards the environment (climate and natural disasters) (Boudiaf - Mekky, 2016, p.6). The tourism explosion highlights this vulnerability.
Since 2015, research began on the effects of this new residential tourism modality on a global level, but above all in the United States market. From this moment on, control mechanisms were developed, some facilitating tourism as an economic activity and others more restrictive (Ortuño & Jiménez, 2019, p.11). In general terms, in Spain measures have been taken to limit the supply, zoning or imposition of moratoriums, which have been implemented in a generalized way, without having carried out an in-depth analysis of the effects generated by tourist housing (Ortuño & Jiménez, 2019, p.3).
As we have seen, the municipality of Cadiz has a certain insular character (Fig. 2), so it has specific characteristics, unique and permanent, different from those present in inland destinations (Simancas Cruz, 2019, p.2). Such areas are considered closed, fragile, discontinuous and limited systems. Therefore, given the impossibility of urban growth in the municipality, policies should be focused on mechanisms that promote the preservation of historical heritage and the intangible values that are linked to it.

Discussion of results and lines supporting urban policies

In this case, the agglomeration of tourist housing in specific areas of the municipality, such as the Historic Center of Cadiz (Fig. 3), represents a rise in the number of tourists

over a very limited area. This is where most of the unoccupied housing and buildings are concentrated. This situation is due to the low level of conservation, partly due to the age of many of the properties. Many buildings in the town centre have some level of protection by the General Plan and the vast majority are not in a condition to be inhabited, making it necessary to rehabilitate them.

Therefore, this massification of the center promotes the rehabilitation of the built heritage of the area, with a view to generating an offer of small apartments, barely of the minimum dimensions, and, for the most part, of a bedroom, for its use as Homes for Tourist Purposes. With which, the rehabilitation process is not generating quality housing, rather quite the opposite. It maintains to a lesser degree, but somehow also, an offer of substandard housing that was already in the process of being eradicated. In this way, heritage elements are being transformed into tourist resources. It should be noted that a cultural element is not a tourist resource if it is not first classified as heritage, and then transformed or managed by agents incorporating it into the tourist market (Sotelo Pérez, 2012, p. 81).

In a way, this type of rehabilitation has as a positive aspect, the regeneration of the old areas of the city. However, the speculative nature of gentrification should not be confused with the urban regeneration processes of the historic center that aim to heal the city, even if it derives, in fact, in processes of regeneration of the city. We must avoid reaching a housing-goods situation that will degenerate into a city-goods. This would lead to a loss of identity, which is, after all, what drives tourism.

Thus, there are two possible approaches to the implementation of strategies for tourism development: balanced development or rapid growth (Boudiaf & Mekky, 2016, p. 4). For the case at hand, a small historic city whose main objective is to strengthen the economic structure and stimulate the economic sector, seems more appropriate the first strategy. It is based on tourism development where the requirements of the tourism sector are compatible with the area and do not ignore the character and authenticity of the historical area (Fig. 4).

As seen, the current model is based on the search for profit by private investors. Thus, in order to achieve, not only the vitality of the promoter's economic, but also an environmental adherence sensitive to scale and site, along with the desired comfort for visitors, some actions must be followed (Boudiaf - Mekky, 2016, p.6):

In order to respond to the problems of preservation of historical and archaeological areas, it is imperative to remember that architecture must be seen as an art that serves society, and that it must seek to provide spaces for people to experience the sense of the place.

The most essential need is to preserve buildings and places that reflect the strong sociocultural relationship and that will be a vehicle for the creation of a particular sense of identity along

Fig. 5
A representative street of the Historical Center of Cádiz. Source: National Geographic Trips.

with physical function and economic viability. It is not necessarily a matter of preserving buildings, but of strengthening their spirit, their essence.

The conservation of historic tourist destinations is becoming increasingly urgent, as they are deteriorating by leaps and bounds. It is almost ironic that a sector such as tourism is one of the main factors damaging the heritage of cities, since it is this same that relies most on culture for its development. The solution does not lie in the rehabilitation or conservation of specific buildings, but in the need to maintain the traditional urban structure as a sign of identity (Fig. 5) and connection between past and future.

Conclusions

To sum up, this is a need for a change in the tourism model that, a priori, is invasive for urban heritage and social model. As it has been seen, in many cases, the existing tourism models negatively affect the social and urban development of our cities. It is not about eradicating the tourist resources, as it could slow down economic development, but to make use of them to create mechanisms that enable and enhance urban regeneration processes.

Therefore, when we talk about carrying capacity linked to the tourism sector, we can find a tool that supports and helps define active urban policies where this sector is recognized

as an engine of opportunities and that, in addition, establishes the guidelines for sustainable growth for tourism.

Sustainability can be understood, in this context, as the preservation of the capacity of a territory so that future generations can satisfy their tourism consumption needs. In this way, the character of sustainability would be achieved through the conservation of heritage (natural and cultural), the maintenance and improvement of the well-being conditions of the population, economic development with a view to reducing poverty and the promotion of culture and customs internationally. Thus, tourism should appear as a tool, and not as an end (of economic development) in itself.

The presence of Homes for Tourist Purposes in the cities generates travel conditions that allows an equality among the population in terms of access to tourism, regardless of its purchasing power. It also helps promote cultural exchange by facilitating coexistence with regular residents. However, for this to be the case, this phenomenon needs to be managed and controlled. In the case of Cadiz, for example, the amount of Homes for Tourist Purposes and the pressure of tourism has generated social effects that could be positive, for the society that hosts, have given way to unbearable situations where individuals can not normally develop their lives.

In addition, the influence of tourist housing on gentrification processes, which have been taking place in the municipality of Cadiz, is clear when you consider that the main reason for this is tourism. Together with the fact that this new type of tourist accommodation is the response that the real estate market has found to satisfy the needs of tourists. This has meant that, in many cases, the population cannot afford to pay the prices that the market sets for housing, so they are forced to move to other nearby cities.

The regulation of tourist housing thus appears as necessary to curb the unstoppable financial market that seems to take none of the above into account and, by seeking greater economic benefit, encourages the disappearance of traditional models of life, distinctive of each society and which makes its cities unique.

In short, it is a complex, but at the same time necessary, coexistence between the built urban heritage, the protection of it through its conservation by use as a tourist-cultural resource, and the influence of these processes on the model of life of the inhabitants.

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DHOKSAT, ARCHITECTURE THROUGH CENTURIES

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Kokoli's House. (Source: Personal archive).

Dhoksat village is part of Lunxhëri region and it is located 10 km from the historic center of Gjirokastra, which is part of the UNESCO world heritage. Less than 700 inhabitants live in the village; these are registered, but almost 100 inhabitants live in it during the winter season. After the 90s, mainly the young people emigrated to work, as the area does not provide economic income. This led to the village abandonment by the younger generations and only the elderly become the protectors of their houses. This rural area had a high number of young people before. Residents live on low incomes that are earned mainly from livestock and agriculture. Since the inhabitants of Lunxhëri have an ancient origin, the culture and the cultural heritage are among the few traces that we still have from antiquity to the present day. One of the most important features of the village are the old houses. Some of these buildings have been ruined by natural causes, by various invasions or even by improper conservation, threatening thus with the damage of the identity of these buildings, and this is the main reason why they require a professional restoration as soon as possible. Despite the changes over the years, this village has managed so far to preserve its origin for generations. Dhoksat is considered a village "praised by God", valued for its beauties, the land fertility, fruit growing, vineyards, forests and pastures as well as for its springs. In addition to being one of the most beautiful villages in the region, Dhoksat village bears also cultural heritage values, including cultural monuments of the first and second category. We can still touch nowadays the historic dwellings built at the end of the 18th and 19th century with a local model of the area with two to three floors, built with the black stone of the Lunxhëri area and with a traditional stone slate roof. Another feature of the village are the Gates. Like that of the "Gogo" Family, of 1869, at the entrance of which are distinctly engraved the date of construction, the artisan and our national symbol, the eagle. The centuries-old tradition of building bridges and springs is another symbol of the village, where St. Mary's Spring, located in the forest below the village should be mentioned. This monument represents the holy spring place where people come and it is still used for religious itineraries on certain dates of the year. Ethnographic values occupy a no less important place, of which the rare folk costume "lunxhe" stands out. Dhoksat village is a unique cultural itinerary in the values it has.

For this reason, the Albanian government made Dhoksat in 2018 part of the national project "Akademia 100 Fshatrat" ["The Academy 100 Villages"], a program, which aims at an integrated development of rural areas through the improvement of public infrastructure, the tourist potential improvement by the reuse of previously lived areas and the social and local development. In order to develop further this village full of values, a project is needed for the development of the area, one of the main points of which should be the restoration of the houses according to the authentic local style, preserving the use of materials or even preserving the historical fabric. Preserving also the architectural feature of the doors, with arches and in many cases a small roof with stone slates over them, as they

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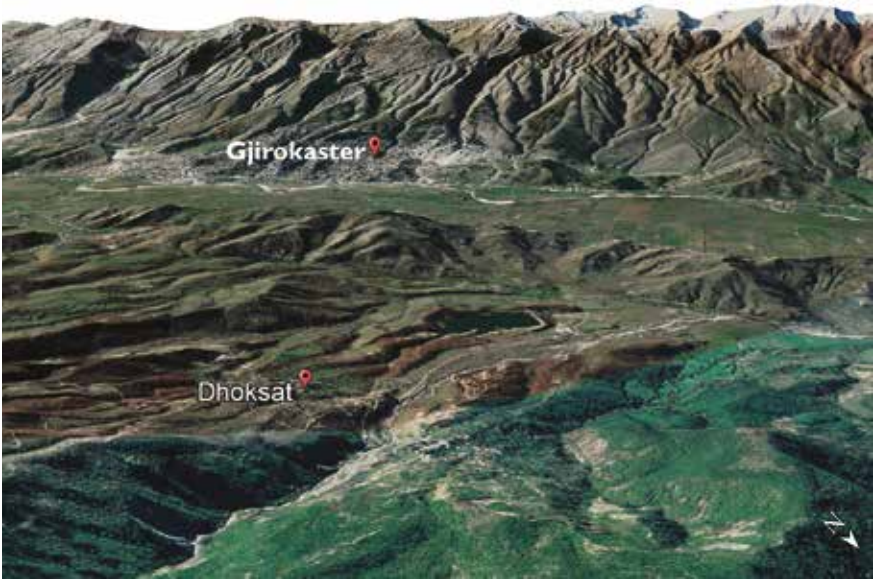

Fig. 1
A bird's-eye view from Google Earth. (Source: Google Earth).

are a key part in the entrance of each traditional house. This should be made possible through the collaboration with local master artisans in order for them to transmit what they know from the other generation. The restoration of the houses will bring a developed local tourism, as these houses will be turned into guesthouses offering accommodation services and other activities from the tradition of the area. In this way, Dhoksat, almost abandoned, can be turned into a wealth for the country, by returning the life full of vividness in the village as well as higher incomes for the inhabitants.

Keywords: Historical buildings; Local techniques; Cultural landscapes; Abandoned village; Touristic potential

Introduction

The Museum City of Gjirokastra is in the "Cultural Property to the World Heritage list" from UNESCO (2005), which confirms the universal values of the city, at the same time, an obligation to protect these values from the entire Albanian society, by residents and owners of the houses declared "monument of culture", specialized institutions for the protection of monuments as well as by the local and central government [1].

Facing the city of Gjirokastra, the province of Lunxheria stands in its villages. Among them is Dhoksati, the village known as the heart of the province of Lunxherisa. The village of Dhoksat is part of Lunxhëri region and it is located 10 km from the historic center

of Gjirokastra (Fig. 1) and 138 km away from the capital of Tirana. The general local plan of the municipality of Gjirokastra defines it as a natural protected area and does not allow constructions, except in urban areas [2].

Heritage assets

Located east of the Drino valley, at the foot of Lunxhëria mountain, Dhoksati seems to be there since the beginning of time. It is not located far from the historic city of Gjirokastra, even though it is not as lively due to the constant departure of its residents. However, Dhoksati is probably one of the most interesting places in the Albanian territories, which has always attracted the attention of many travelers who have known and touched it. Dhoksati is a village whose natural, cultural and historical riches are difficult to list. Many Albanian and foreign authors have written about it, but this apparently has never been enough to reveal it completely, probably because it summarizes at the same time a world so unknown and fascinating, that despite the changes and abandonment has still preserved its identity. The constant interest of history trackers has not been unintentional. One of them is Lord Byron [3].

Quite well known is also the story of his journey, he passed through the village in 1809. As a result of bad weather, the bridge over the abducted Grabovica stream has been destroyed. The local women, the only labor force found in the village, as the men lived in exile, gathered and built a temporary bridge with circumstantial means that enabled the Lord to cross and continue his journey to Tepelena. Dhoksati is also part of the ancient Albanian territories for which the French consul near Ali Pasha, François Pouqueville says that "it was inhabited by christian Albanians who were an ancient native population of Pelasgian origin who settled there before the old Hellenic tribes." Dhoksati is an early settlement with documented historical data from the XV century. However, the village gained its splendor during the IXX century, when many of its characteristic houses were built [4].

Actual state of the village

The inhabitants of Dhoksat as well as the neighbors of the surrounding areas in a good part were forced to emigrate from the earliest of times, as the area of Lunxhëria is an area with insufficient land and was not able to provide food for its inhabitants. These distinguished people in the field of construction were always on the move to find work in this field in different parts of the Balkans, which were also parts of the Ottoman Empire and especially in its capital, Istanbul, where they were mostly located. In the Ottoman Empire, the people of Lunxhëria enjoyed the privilege of holding this craft by royal decree inherited from

Fig. 2
The central square of Dhoksat. (Source: Personal archive).

Fig. 3
The craftsman Arif Huso working with the students on the restoration of the stone slate roof of the Middle Fountain during during the RRC with the CHwB AL. (Source: Personal archive).

generation to generation, both in Istanbul and in the other major cities of the Empire. It is curious that the people of Lunxhëria, despite being known for carrying out construction works, did not build all the houses themselves. They have been overwhelmingly set up by masters from other areas who built the houses based on the visions of the people of Lunxhëria who lived abroad. The village seems to have been carefully designed to be organized around a ring road on either side of which houses are located. The central square is at the entrance of the village and connects directly with the ring. Right in the central square, the centuries-old maple tree rests quietly, which seems to protect all those who enter and leave the village.

What makes this village interesting are the buildings with their traditional architecture, inspired by the tradition of Gjirokastra and the region as well as the three fountains of the village which are very interesting works that show rare construction skills. Furthermore, some of the constructions have special artistic and architectural values such as the symbols on the gates which are found everywhere, they showcase the antiquity, myths, legends and everything else that has accompanied the Albanian population since ancient times. Although today, part of the architectural heritage has been changed over the years, its character has not been lost and Dhoksati remains one of the most beautiful villages in southern Albania. Its historical and architectural landscape is one of the most special material values of the region, but even the immaterial values are very impressive too. The inhabitants follow the tradition of immigration but now they are returning more and more rarely to the village. This has led to a shrinking population, where today there are older inhabitants and the amount of young people keeps sinking.

The village school has been turned into an abandoned building because there are not enough children to function. Agriculture and livestock have seen better days as there are now not enough labourers. Although the challenges of the future may not seem easy, Dhoksat seems to have plenty of room for improvement and possibilities of returning to its former glory. Although today there are over 500 people registered in the civil registry currently only 130 permanent residents live there most of which are adults. This demographic distribution comes mainly as a result of emigration to Greece and other western countries. The village has an early migration tradition as, since the XVIII century, the men of the village worked in the most developed areas of the Ottoman Empire. They lived in migration for periods of several years, while their families stayed in the village. During the communist regime this tradition was interrupted as a result of the total isolation of the country while in the last thirty years the tradition has changed, as residents emigrate with their families, leaving in the village only parents who are more connected to the territory. Young people lack Lunxheria, their voices, careless actions and liveliness that can often be given only by them and have left behind them only silence. However, the former emigrants have not lost touch with the village and it seems that some of them, especially after the economic crisis, have turned their gaze to it as an opportunity to set up their own businesses and invest.

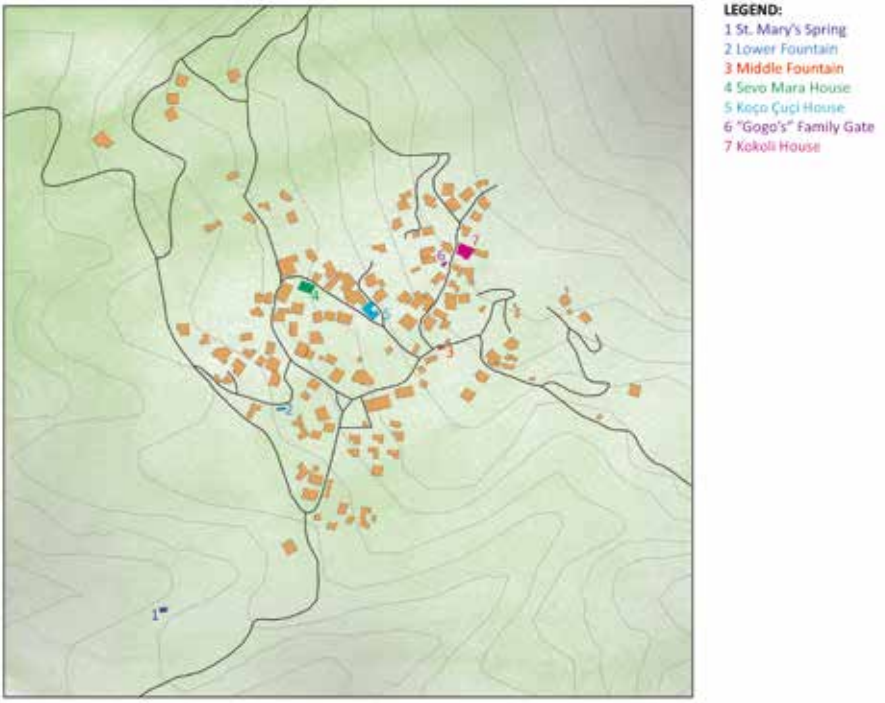

Fig. 4
Dhoksat village map including the cultural monuments. (Source: Personal archive).

Fig. 5
Koço Çuçi's House. (Source: Archive of the Institute of Cultural Monuments).

Past and ongoing projects

In recent years there have been many proposals for the revitalization of the village of Dhoksat due to its apparent touristic potential. Albania's economic and urban development plan for Dhoksat states "Dhoksat will be part of areas of National importance for National Parks, Natural Protected Areas of each category, mainly Dhoksat which is part of Lunxhëri Mountain Area (proposed as Area of Importance National Natural)". The Albanian government made Dhoksat in 2018 part of the national project "Akademia 100 Fshatrat" ["The Academy 100 Villages"] [5], a program, which aims at an integrated development of rural areas through the improvement of public infrastructure, the tourist potential improvement by the reuse of previously lived areas and the social and local development. This initiative consists of a four-year program that aims at providing financial support for infrastructural, economic, and sustainable tourism development.

In year 2019, Cultural Heritage without Borders - Albania (CHwB) through the 47th Regional Restoration Camp [6], restored the roof of Gogo's gate, the Middle Fountain (Figure. 2 and Figure. 3), the side walls of Gogo's gate and the St Marys' Spring.

Residents say that despite the many projects presented in the letter, in reality the intervention in the village has been minimal, almost negligible. The danger that threatens this village if it is not intervened as soon as possible, is great. The biggest problem at the moment is the damage of buildings for various reasons, which in some cases are left until their total demolition due to the economic impossibility of the inhabitants, while in the best case the locals try to restore them with unprofessional methods, which irreversibly damage the identity of the village.

Village's most important feautures

The style of house building has evolved towards a model that now resembles more of a house than a castle due to the fact that it has been influenced by communication with the outside world.

The people of Lunxhëria have always been looking for the best and the most beautiful and for this they have emigrated, and from there they have brought the European and American culture and civilisation. The characteristic houses of the province look imposing with the high and thick walls that from one side give strength but without touching at any moment the aesthetic side which has been given a lot of special attention. In the entire district of Gjirokaster, including the village of Dhoksat the construction category has a great prevalence in the constrution of the tradicional house, an important value in space and time which has a simple functional scheme and a perfect connection with the

Fig. 7
Sevo Mara's House. (Source: Archive of the Institute of Cultural Monuments).

Fig. 8
Gogo's gate. (Source: Personal archive).

land. The structure of the building starts from the perpendicular houses to the more developed version with two wings. For understandable reasons related with the time of construction, local materials had been main for all categories of construction. Firstly, the stone was used in wall structures and protective walls, in layers and in roof coverings, alongside with timber, lime and sand [7]. Additionally, the walls inside of the building has three layers. The first one is made of mud and hay 2-5 cm and after applying the mass comes the second layer made of lime and goat hair. After adding this, the final layer consists in dying the wall using natural water and ash water.

The houses had their own territory (Fig. 4), their yards and streets which were paved with cobblestones.

Fig. 9
Gogo's gate wood structure. (Source: Personal archive).

Koço Çuçi's House (Fig. 5) is one of the most imposing and above it stands Sevo Mara's House. Continuing with Kokoli's House built in 1901 (Figure 6), which has three floors and was built with the black stone of the Lunxhëri area. It also has a traditional stone slate roof. Koço Çuçi's apartment was built in 1860 and has been inherited from generation to generation by the Çuçi family who continue to live in this building. The building consists of two floors, where the upper floor is used as a living area while the lower is mainly used for auxiliary or storage facilities. Occasional restoration interventions carried out over the years have preserved the main elements of the building but have also carried out changes in the structure.

The constructive walls of the apartment are made of black stone. The building is one of the best examples of architecture of the province of Lunxhëria where, in addition to architectural and urban values, offers the opportunity to see closely the construction techniques, ways of treating the interior and organizing the spaces of traditional buildings in this province.

Sevo Mara's House (Fig. 7) in its present state, is dilapidated and from the former house only the masonry of the ground floor remains. It is not accessible and has suffered damage to the elements and intervention without following any criteria. The only element that is not touched is the courtyard entrance gate. The house had two floors and has the general characteristics of the area having the ground floor for cattle or as a storeroom for food and the upper floor for living, divided into rooms and the central space.

The centuries-old tradition of building bridges and springs is another symbol of the village, where St. Mary's Spring (Figure. 10), located in the forest below the village should be mentioned. This monument represents the Holy Spring place where people come and it is still used for religious itineraries on certain dates of the year.

area using stone pavement and dry wall technique during the RRC with the CHwB AL. (Source: Personal archive).

Proposals for intervations

These, but also many other facilities in the village need a restoration as soon as possible as they constitute the strongest tourist potential of the area. A good restoration of them would pave the way for the promotion of the creation of rooms for accommodation in village buildings in

Fig. 10
St. Mary's Spring after creating stone steps and a small resting area using stone pavement and dry wall technique during the RRC with the CHwB AL. (Source: Personal archive).

Fig. 11
The gates are of Dhoksat village. (Source: Archive of the Institute of Cultural Monuments).

the system Alberghi difussi (scattered hotels). Buildings located in historic areas are given a second life as they welcome visitors eager to learn about and experience local culture. This is the albergo diffuso (scattered hotels), which is a hospitality concept designed to develop tourism in hamlets and old town centres without changing their characteristics, differently from new build hotels or resorts. It only requires the cooperation of village residents that offers the services of a traditional hotel along with a space that is like a rented private home that can open up their homes to tourism in a coordinated way. A team of experts from the Alberghi Diffusi Association is assessing Albanian villages that belong to the 100 Villages Strategy to evaluate the possibilities of implementing model in the country. The team led by Prof. Giancarlo Dall'Ara (President of the Association) visited several Albanian villages in Gjirokastra. After his first visit, Prof. Dall'Ara stressed that there is potential to develop the model: "We have seen some typical and authentic Albanian villages, which have much in common with the villages in South of Italy where this model was implemented successfully" [8].

Combination of architectural history and the magnificence of the landscape, in a way we are able to preserve what we need in future history for the following generation.

These locations were the image of a losing tradition, the lifestyle of poor people, a way of life experienced with modesty. These places were born from the most basic struggle for survival. They are beautiful, but above all, impressive. Somehow, these are timeless places, for the very reason that they belong to a poor heritage, to a rural, minor, marginalized culture, that did not sensibly evolve over the last few centuries [9].

Another necessary intervention is the arrangement of public spaces, squares and village streets. For the village roads it is proposed to systematize the cobblestones in those

segments where it has suffered minor damage and its renovation in those parts where it has been totally damaged as the cobblestones are considered by the inhabitants as a real pearl of Dhoksat tradition and culture. Interventions should be made in the inner roads of the village to remove the concreted or asphalted parts. Even these roads should be paved according to different typologies and techniques that better fit the relief. Different categories and types of public spaces will lend themselves to different kinds of measurement. At the same time, the same indicators will have to measure our public space goal: supply, quality, distribution and accessibility [10]. Creating and maintaining high-quality public spaces requires joined-up thinking and working across occupations and organizations.

The gates are also an attraction of Dhoksat village (Fig. 11). Gates for the entrance of a traditional house are important features and give character to the whole dwelling. A larger or more elaborately designed door od gate indicates that wealthier or more powerful house owner installed it. These gates are usually double leafed and traditionally made of wood and ornamented. Originally, gates were not painted with colors, but oiled. Later, during and after the socialist era, residents started painting their gates in blue, green [11]. Entrance gates are usually placing with an arched stone frame. Unfortunately, many of them are in poor condition and need restoration to become a characteristic feature of the village. You can find symbols on the gate everywhere, they hide the antiquity, the myths, the legends and everything else that has accompanied the Albanian population since ancient times.

The people of Lunxhëria have been distinguished in the art of finding water resources from where they supplied it to poor countries and everywhere, they were welcomed because they had gained a good name, securing the monopoly of this difficult craft. Precisely for this reason in Dhoksat could not miss the Fountains and the squares in front of them which have always served as gathering spaces. Generally, squares have a simple shape with a centuries- old plane tree in the center, which is still present in villages in South Albania.

To give them their former shine, these key nodes of the village need to be requalified. It is important to preserve the irregular and organic forms of these spaces as it is precisely these elements that give the village its special identity. In order to promote the settlements of Dhoksat village as a main point of culture there should be a cultural space in the form of a museum for Lunxheria region. A cultural space first for the inhabitants of the area and then for the tourist benefit of the country. A place to promote local culture such as: traditional costumes of the Lunxheri area, handicrafts of the inhabitants and even folklore heritage. This initiative will bring movement in their lives, transmitting these traditions to local descendants and to Albanian and foreign tourists. This type of promotion of local heritage will not only bring a museum space, but also

another opportunity where people will be able to participate in various workshops at certain times of the year, where they can get closer to the local culture.

Conclusions

Dhoksati is the least abandoned village and has the perspective that the population will increase with the return of emigrants who have love for the homeland and seek and do their best for the improvement and development of life, revival and enrichment of traditions. With the right interventions, this village has all the potential to return to its golden days and to fill its streets as it deserves. As you walk along these roads it is not difficult to understand what was the reason that made many travelers call the people of Lunxhëria Pelasgian because here the ancient civilization is preserved in every family, in every corner in every village that still radiates nobility from ancient times of this province.

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TOWARDS A MULTIDISCIPLINARY APPROACH FOR CONSERVATION OF CULTURAL SETTLEMENTS IN ALBANIA

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The village of Old Qeparo, Albanian Riviera, proclaimed historic center in 2016. The old village situated on the highest hill, is being abandoned because of the new village built nearer the national road.

With the beginning of the 20th century many traditional settlements in Albania, as all around the world, faced major challenges in many aspects of people's life. Knowing that the built environment is the direct result of the intervention of man in the natural landscape, these inhabited areas successfully adapted and transformed throughout the centuries up to the early 1900. Many of these rural and urban areas found themselves unprepared to adjust to these new conditions.

As a consequence to new needs for shelter, work and services, a rapid process of separation with traditional ways of life was triggered. Along came adaptation, transformation and abandonment as a result to various human-based or nature-based factors. However, it is undisputable that many of these rural and urban vernacular settlements have invaluable vernacular assets that bear the traces of past life and comprise the spirit of these cultural landscape areas.

Numerous traditional settlements in the Albanian territory are without doubt example to extraordinary architectural and urban achievements. They testify to the human life within these areas from ancient times to nowadays. Depending on the geographical position and their character, they are abandoned, transformed or in some cases even successful adjusted to contemporaneity. The de-population process leads to neglect, gradual deterioration and finally the destruction of the traditional environment built with the experiences gained over the centuries.

Researchers working in the cultural heritage institutions in Albania carry out studies focused mostly in the technical architectural and urban aspects of these settlements. A distinguished process of research, documentation, and protection of these areas has been realized through the years. These areas have been considered as natural laboratory to observe and understand how people in these regions have lived, their character, traditions, economic and architectural achievements among other things.

With the increase of scientific and economic interest to exploit the cultural assets of the traditional settlements, new challenges have been presented to researchers of the field. The situation is mainly directed by the debate of protecting the integrity and authenticity of the traditional vernacular settlements while aiming their rehabilitation, reverse abandonment and how to manage their sustainable use.

The existing situation in Albania faces restoration and rehabilitation interventions of some traditional vernacular settlements and the results of these renovations are still to be proven successful in terms of reversing the abandonment phenomenon happening.

This article aims to discuss reasons of de-population that differ in the countryside and in the urban areas; pros and cons of re-evaluation alternatives to for rural and urban settlements and to develop proposals that go beyond the technical preservation of architectural heritage in the Albanian built environment.

Keywords: Albanian vernacular architecture, rural abandoned settlements, cultural landscape, cultural heritage, rehabilitation of rural traditional settlements

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Introduction

The rural population composed the majority of the Albanian people until the beginning of the 20th century. As a result, the number of rural settlements outnumbers the urban ones and the rural vernacular architecture is of a major importance for the Albanian culture[1]. This architecture has been built throughout the centuries with one purpose: respond to the needs for shelter and work of its inhabitants. As such, it is resourceful in typologies and building achievements and provides a good database for the characteristics, customs and ways of life of these communities.

The success of the traditional settlements through the centuries can be understood by knowing the main actors triggering any evolution or change within the community, simultaneously with the non-human factors that are fundamental to its longevity. The creation of the vernacular architecture depends entirely on the resident (who determines the requirements for shelter and work) and the mason (who decides the layout that better corresponds to those requests). Such a combination is complemented with the geographic, topographic, climatic and socio-cultural factors and have produced ensembles of exceptional and unique values.

By carefully reading this living environment, it is possible to understand the life, demands, aspirations, challenges and threats that they coexisted with successfully. With this information in hand and facing the major challenge of abandonment of the traditional settlements, it is obvious questioning: *Why the traditional built environment is not enough anymore? What are the reasons behind abandonment? What are the means to reverse it?*

The answers must provide the required arguments in order to understand what made them successful, why there were abandoned, the link between the two and open set new opportunities to help these traditional environments not to lose their unique built heritage that is meaningful for the period it represents.

The abandonment of the urban and rural traditional settlements is a worldwide phenomenon nowadays. With the 20th century many of them faced abandonment due to human and non-human factors. The endangered architectural built heritage is all what it is left of them. Nevertheless they bare powerful testimony of past life and they incarnate the identity of these communities. Behind the lack of population in these areas, the loss of built environment is the most visible representation of de-population, degradation and destruction. (Fig. 1)

[1] Mitrojorgji, M., Mitrojorgji, J. (2014) *Form, architecture and content, a journey in the vernacular architecture of Albania.* Media Print, Tirana.

Factors (human and non-human)

Both, man and nature can be the cause for abandonment. Nevertheless, these factors differ in relevance from place to place. A presentation of these factors (human and non-human) can clear the picture for the Albanian reality.

1. Human factors

   Socio-cultural and economic factors

   The socio-cultural conditions can be understood such as unemployment, lack of agricultural efficiency, investments and services, education, infrastructure, and even psychological aspects related to the discontent with the existing life conditions, desire for better economic and cultural life, etc. This situation triggers an increase of inhabitants in the big urban areas. New technological developments and industrialization caused on one hand a concentration of the rural population around the industrialized areas of the cities and depopulation of the rural areas on the other.

   This is true for many Albanian traditional settlements between years 1945-1990, when many rural settlements started the unprecedented process of abandonment due to demographic movement from rural to urban areas.

2. Political factors and conflicts

   Armed conflicts and wars can also be directly linked with the security of the population, causing obliged immigration in several levels. Throughout history many settlements have been abandoned with no return due to wars. These forced abandonments cause mostly total loss of the settlements, partial or entire destruction due to sudden depopulation.

   Up to the end of the 19th century, during the occupation period of the Albanian territories under the Ottoman Empire, there are registered cases of sudden abandonment of settlements due to war occupation. This occurred even though the Albanian people are known for the close liaison with its land.

3. Other factors

   Natural disasters such as earthquakes, massive fires, floods, landslides, volcanic eruptions or avalanches that are unpredictable phenomenon that happen without warnings are considered as natural factors that cause abandonment of settlements. It seems contradictory knowing that in modern times, man is considered to be one of the main causes for climate changes without consideration for the consequences that his actions may have on nature and all its components.

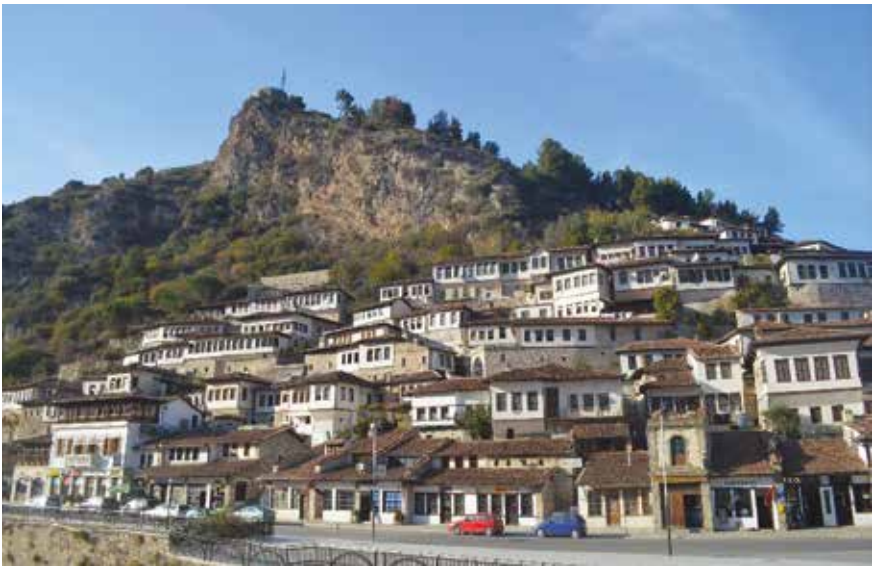

Fig. 2
View of Mangalem neighborhood in the urban town of Berat that suffered from the earthquake of 1850 and was rebuilt with new technical improvement.

Few registered cases of major natural disasters can be linked to Albanian territories. Such disasters are known to have happened in the urban settlements of Durrës[2] (Durrachium) that has been subject to earthquakes in ancient history and of the city of Berat[3] with the earthquake of the 19th century. In both cases the urban areas have adapted to new ways of living and building. (Fig. 2)

Fig. 3
The rural settlement of Lukova village where the interaction of man with nature resulted in the built fabric and the orange terraces around the village.

Consequences of abandonment

1. The consequences following the above mentioned factors have several impacts in terms of culture, nature and people.
   The loss of cultural heritage, proper to a given place, where a given community lives according to certain common traditions, means to lose the cultural assets and break the cultural chain connecting generations.
2. The depopulation of rural settlements does not only affect the culture of a place, but also causes the loss of natural environment, agricultural landscape and bio-diversity of that place. (Fig. 3)
3. The loss of cultivated land due to abandonment causes decline in productivity.

[2] Sara Santoro and Alberto Monti (2004). Carta del rischio archeologico di Durres. In: Maurizio Buora and Sara Santoro (eds) Progetto Durres: Atti del Secondo e del Terzo Incontro Scientific. Trieste: Editreg, 525–587
[3] Meksi, A., Riza, E., Bace, A., (2011). *Berati historia dhe arkitektura*. Akademia e Shkencave e Shqipërisë

4. It has to be taken into consideration the price to pay to minimize the negative impact that abandonment has on bio-diversity and environment, by preventing migration and depopulation.
5. Another aspect to address is the loss of local identity of the place. People migrate in urban areas or abroad and face difficulties in adapting to new ways of life. They struggle to detach from their roots. Nevertheless, it is unlikely that they return back to their old living area.

The Albanian context

The Albanian territory is characterized by a majority of rural population versus urban one; there exist more rural traditional settlements expanded all over the territory. These settlements differ in typology, architecture, traditions and customs[4]. It is evident that the rural settlements are more vulnerable to abandonment than the urban ones. This is true even for the Albanian context where the traditional urban ensembles have been surrounded by the urbanized city without being affected due to their dense urban fabric.

Some of the relevant periods in history that have shaped the traditional building fabric, starting from medieval times to nowadays, explain the existing situation of both urban and rural settlements:

[4] Thomo, P. (1981). *Banesa fshatare e Shqiperise.* "8 Nentori", Tirane,

Fig. 4-5
New uncontroled intervention versus traditional abandoned building in the historic center of Himara, Albanian riviera.

1. During the Ottoman occupation that lasted till 1912 with the declaration of independence, the abandonment of the living environment is mostly due to war and armed conflicts that directly impinged life security of the inhabitants.
   The Albanian village is strongly linked to the land and finds itself unable to overpass the regional frontiers[5], also due to the consequences of the centenary Ottoman occupation. It fulfills all living needs within a limited environment that includes the house, the village and very rarely extends to nearby regions. The boundaries of the settlement comported the living area and the economic one, in order to complete all necessities for food, work and building material[6].
2. From 1912 to 1945 is a period characterized by a slow development when boundaries between country and city become smaller and even urban architecture influences becomes visible in the rural built fabric. During this time few demographic changes can be mentioned.
3. The period from 1945-1990 corresponding to the communist regime is when most of the state structures and institutions are consolidated in many aspects. The rise of the education system, building infrastructure connecting the entire country, services provided next to your living area, new possibilities and better life conditions for everyone, the need for skilled workforce and personnel to serve in all the branches of the state economy, results to controlled demographic movement from rural areas to the cities. The young generation is attracted to the city, to education, to work, to better life in residential buildings (by living behind the traditional houses that needed constant expensive maintenance). The rural population is reduced mostly to the third generation that have difficulty breaking with traditions and land.

[5] Thomo, P., Riza, E., Muka, A., (2004). *Vendbanime dhe banesa popullore shqiptare 1*. Toena, Tirana
[6] Thomo, P., Riza, E., Muka, A., (2004). *Vendbanime dhe banesa popullore shqiptare 1*. Toena, Tirana

That's the era of industrialization for the Albanian society and it came with the inevitable process of abandonment of the rural settlements.

4. After 1990 and the end of the communist regime, big changes happened. People migrated from all over the country, mostly from rural areas by causing a large scale abandonment of these settlements. Immigration from country regions to the cities and abroad. From one side there is the large scale depopulation of the rural areas and on the other side the uncontrolled growth of the existing cities that had to welcome and shelter massive groups of new residents within their existing boundaries and infrastructure.

Conservation of rural settlements

As researchers in architectural heritage, we find these traditional settlements as architectonic laboratories (stuck in time and space) that help us know and complete the puzzle of built heritage within the Albanian territories. Somehow the abandonment of living areas provide us with unchanged information for a specific given period and we understand the way of life, traditions, customs and building knowledge used by these communities.

With the creation of the National Institute of Cultural Heritage (NICH) in 1965, an exemplary research work has been carried out for the documentation in large numbers of built heritage (in rural and urban areas). These studies built the methodology for knowledge, protection and management of the local architectural heritage, as well as conservation principles. Until the 1990, the work of NICH has been focused in documenting the built heritage all over the country and putting under state protection only few - due to lack of funds for restoration and conservation - urban settlements (1961) of major importance, such as Gjirokastra and Berat (enlisted in 2005 and 2008 as WHS), or even Shkodra, Elbasan, Korça, etc. In addition, lots of single exemplars of vernacular architecture were added to the protection lists as distinctive representation exemplars.

The rural vernacular architecture was not part of significant studies in comparison to the urban one. It was documented and studied case by case, even though there is monographic bibliography available written that focuses on this typology. As a consequence, these settlements were more vulnerable to losing their cultural values when facing abandonment, lack of maintenance, destruction or even uncontrolled interventions. (Figgs. 4, 5)

From 2013 the focus of national government and NICH has been more oriented to protect more endangered vernacular sites as a result of the rapid loss of heritage that these sites suffered in the last decades. Due to the experience and the research work of NICH and in

accordance with the best international practice and recommendations[7], in order to best protect and conserve the vernacular architecture and adapt to contemporary challenges for re-vitalization, the work process is realized with the aim to achieve a five step process:

1. *Defining the important cultural and natural values of the settlement*; this is the main task of national cultural heritage institutions. Following with definition boundaries of protected areas and buffer zones, within which the traditional settlements, natural assets and surrounding landscape are to be defined. Boundaries of protected areas should consist in the core area, including the traditional buildings, roads and squares, and the buffer zone around it that has visual and social impact over it. It is of imperative importance identify the state of the built fabric and reasons of abandonment. This step will guide the future decision making for re-vitalization of the site.
2. *Determination of the re-vitalization opportunities for each site*; this step requires the identification of re-vitalization alternatives by national and international partners, stakeholders and most important financial resources aiming the protection of the site. Considering that the economic power of the property owners is very limited in the rural areas in general, the development and conservation process of the rural areas rich in cultural heritage depend on the economic resources provided by (i) public and private sector and (ii) financial exploitation of internal potential of the area.
3. *Determination of conservation policies*; after defining the cultural values and determining the re-evaluation alternatives, the process should continue by determining the conservation policies such as financial resources, tools, conservation methods and priorities for sustaining the cultural and natural values of the settlements integrated with other national policies.
4. *Implementation*; the tools, timelines, resources and methods of projects should be defined as work packages in the implementation process.
5. *Monitoring and evaluation*; Conservation of rural heritage and sustainability of rural life can only be achieved by monitoring the proposed implementations, the cooperation between all stakeholders and sharing the knowledge and experience.

Today, the National Institute for Cultural Heritage manages 21 historic centers (urban and rural). Eleven of them have been proclaimed form 2013 to 2018 with the increased focus and interest of the government on cultural heritage as a developing motor for tourism. Nine of them are rural abandoned of almost abandoned settlements, that are subject to private uncontrolled investments or planning to do so.

[7] ICOMOS (1999). *International Cultural Tourism Charter Managing Tourism at Places of Cultural Significance*.

The historic center department by the NICH has carried out an outstanding research process for the identification, documentation, protection regulation and management for these rural sites aiming simultaneously the protection of the built vernacular heritage and opening opportunities for creating sustainable local touristic businesses that can attract both existing and new owners and promoting cultural tourism. On one hand the state focuses on the vernacular cultural heritage that is being lost by abandonment and on the other hand it tries to create opportunities that attract investors.

Possibilities for re-evaluation

V.1. Reforestation approach

This approach is based on the simple principle of converting the abandoned rural settlement to the wild life by abolition. This means destroying the rural environment created by the continuous interaction of man with nature and by this losing the existing cultural heritage forever.

V.2. Open-air museum approach

This approach signifies that (i) buildings are dismantled from their original location and relocated in an open-air museum in order to be visited by the public, or that you convert (ii) an entire rural settlement into an open-air museum.

The first option provides open campuses gathering examples of different typologies, periods and themes in a common area where this presentation can be used as an effective tool for raising awareness, keeping tradition alive and introducing past rural life to local communities.

The second option, which is more accepted by the contemporary methodology for conservation and restoration, is that the rural environment is to be kept as far as possible in the original location as an approach favoring the scientific quality.

V. 3. Tourism approach

Another possible approach is the re-functioning of these environments for touristic purposes, which has created new economic resources for countries and has affected their policies. This approach has been recognized for its positive and negative impact in preserving cultural and natural heritage[8]. As for a fact, rural areas endowed with natural and cultural amenities attract more and more people due to the growing demand for alternative holidays. The term rural tourism is also attracting more investments as small-scale businesses provide services such as accommodation, food and beverages to visitors who aim to have a

[8] ICOMOS (1999). *International Cultural Tourism Charter Managing Tourism at Places of Cultural Significance*.

Fig. 6
The revitalization of rural historic centre of Dhermi (photo by albanianadf.org).

Fig. 7
The historic centre of Theth.

pleasant time integrating local values with pleasure, adventure and holidays. "Albergo diffuso" (scattered hotel) is the most common model use for revitalizing rural regions (example of Italy).

V.4. Resettlement approach

This approach aims the usage of this built environment with its authentic function and can be achieved in two ways: (i) the return of the former inhabitants (ii) resettlement with new ones.

The first option (i) relies on the old inhabitant's willingness who left their old settlement to return there regardless from the reasons that made them abandon their homes.

The second option (ii) is to attract new residents who like living in the countryside due to uncontrolled expansion of the cities.

First of all, most of the abandoned rural settlements have been subject to economic difficulties and lack of opportunities.

Second, the following transitory period and lack of state supervision and corruption have facilitated the uncontrolled growth of the cities and has lost control on the territorial management.

Third, several decades of abandonment and neglect of cultural heritage has worsen the conservation state of cultural heritage assets overall.

Forth, the state budget for cultural heritage is incompatible with the real requirements for restoration and conservation.

With the proclamation of new historic centers and the regulations for their protection, conservation and management according to Law no. 27/2018 "For cultural heritage and museum", the inhabitants, investors and national cultural heritage institutions are oriented on how to protect their cultural assets, how to conserve by not stopping touristic development. Also it has proved to be an excellent opportunity for governmental

and private institutions to apply for funds for their rehabilitation with the purpose to promote this Albanian sites and tourism.

The Albanian government policy has a focus on the touristic development approach and national / private institutions in collaboration with the NICH have carried out the revitalization interventions in big scale in some rural historic centers near the Albanian Ionian coast where the touristic development has a great possibility to be combined between cultural knowledge and seaside holidays. The role of NICH have been crucial in the gathering of data, directing the idea-project in order that interventions might be according to the official regulation plan that manages each historic center and supervising the quality of works realized.

With this purpose in mind, two historic centers (Dhermi and Vuno) have been subject to general conservation and restoration interventions with the boundaries of the proclaimed historic center. Infrastructure restoration works, the conservation of the traditional houses and restoration of buildings that are proclaimed monument of culture[9] have been realized by the end of 2019. The general investment was completed by the Albanian Development Fund in collaboration with NICH and it is financed by the Albanian government and CEB (The Bank of the European Council). The interventions on the traditional buildings comported the external and structural components such as wall masonry consolidation, roof restoration or new roofs for ruined / abandoned buildings and doors / windows. This process opened the opportunity for local residents, remote residents and new ones to invest in the creation of accommodation facilities for touristic development that could offer a unique experience of the local rural settlements with its architecture, nature and culture. The conservation works were followed by an increased interest for investments, a process that is being monitored permanently by the NICH to assure that all interventions are being proposed and realized in accordance with the regulation plan for the protection and management of these historic centers. (Fig. 6).

The project for the re-vitalization of Dhermi and Vuno villages are the first investments realized in the rural traditional sites in big scale. The selection of the sites was made to ensure the future of the investment due to the important publicity of the Albanian government promoting the Albanian Riviera as an incentive for touristic development. The first steps of putting under protection the sites, documenting and setting the possible list of interventions and the overall investment have been completed. The first results in both sites are visible with the increase of private investments and increase of touristic attraction in the past two years. More

[9] Law nr.27/2018 "On cultural heritage and museum"

follows with the ongoing survey of the conservation state of the traditional buildings and monitoring new interventions done by private investors. It is obvious that in these case the first signs of residents returning are happening. The continuous monitoring of the situation and writing a successful management plan are the steps to do next in order to assure the longevity of the investment and its success.

The following example shows the northern rural settlement of Theth (proclaimed historic center in 2017), a growing touristic attraction in the past years. The village of Theth was almost abandoned with few all year residents living there during also the long and cold winter season because of the lack of transport infrastructure. Meanwhile, in the summer it has become a preferred place to visit due to its marvelous nature, landscape and architecture. A project leaded by GIZ, German Cooperation and where the NICH was part of the collaboration[10] called "A Guideline for the Building tradition in Theth" have been published in 2018 aiming to ease the general pressure for new accommodation infrastructure due to the growing number of tourists. The financial aid of GIZ to the local familiar tourism in this area saw the need to also provide a guideline for protection and intervention in order to protect the local heritage, without which there would not be tourism. The aim of the guideline is to protect the vernacular architecture of Theth[11] throughout traditional building knowledge recommendations for interventions. It is not its purpose to impose sanctions but rather offer more building information for the locals on how to preserve, restore and intervene on the existing built fabric. On the other hand the regulation plan for the historic center of Theth (2017) done by the NICH completes the panorama by correctly directing allowed and not allowed interventions. Nevertheless, due to the remote region, it has proved challenging enough to continuously monitor the process because informal buildings have been registered damaging the local vernacular landscape.

Conclusions

The overlooked vernacular architecture of the rural settlements has been not known, protected of promoted accordingly and the abandonment process from where most sites passed through has caused irreparable damages in terms of human life in the settlement and culture / nature component. It is true in for all rural areas in Albania, even though the losses are higher when it comes also to built heritage.

[10] GIZ, 2018, *Udhezues mbi trashegimine ne Theth* (https://issuu.com/cabraalbania/docs/udhezues_per_trashegimine_ndertimor)
[11] GIZ, 2018, *Udhezues mbi trashegimine ne Theth*

It is necessary to study and research this architecture before investing in big scale in them. Without the scientific knowledge on all the site values, it is not possible to protect, conserve and exploit sustainably their cultural and natural assets.

Facing the lack of research on the rural traditional sites, the focus of the NICH in accordance with the government policies has been on documenting, valuing and protecting the vernacular heritage. In the same time, we are aware of the time challenges, we are aware that it requires enormous amount of funds to invest in rural areas subject to abandonment.

The touristic approach has given the opportunity to: (i) researchers to be able to study this beautiful architecture, (ii) protect by law and promote, (iii) attract funds for conservation and development incentives in order to offer in the same time knowledge, raise awareness, tourism and ensure to pass the these values to next generations.

The collaboration between state institutions responsible for the protection of cultural heritage and national or international organizations is proving to be successful in terms of the developing through tourism. On the other hand, a controlled process of interventions according to an internationally accepted principles is ongoing and setting the way for more similar experiences.

The challenges ahead are to assure a correct and successful management of these areas as an ongoing process of protection of cultural heritage.

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PELUQUERIA

A 'FILTER' BUILDING IN THE CABANYAL QUARTER OF VALENCIA

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Pictures about charactristic houning of the Cabanyal Neighbourhood. Author: G.P.

Many European cities are often home to degraded and/or abandoned areas or entire quarters that are, despite their state, characterized by a high level of cultural interest as historical memory of the city itself. It is therefore of great interest to regenerate these areas to restore their original value. The case study analysed in this research regards El Cabanyal in Valencia, Spain. This neighbourhood is situated between the historical city and the Malvarrosa Beach and was established and developed starting with the maritime activities carried out in the city. Over time, however, the area has slowly lost its original function, displaying increasingly evident degradation. In fact, the last twenty years have shown that the state of conservation of numerous dwellings has become increasingly precarious. The research proposes a 'filter' type of housing that would be used to rebuild an abandoned plot located in this neighbourhood. The objective of this architectural project is twofold: regenerate an abandoned area and create a public space that can house services for residents in the neighbourhood and beyond. The building designed acts as a 'filter' and is designed to allow people to pass through. Passage through the building was conceived as an 'expository path', where a permanent exhibit related to the historical photos and documentation of El Cabanyal can be presented. The façade is characterized by the presence of microperforated sheet metal that turns the building into a recognizable 'presence' in the evening. The building is 'transformed' into a large lantern that lights up and attracts interest towards a quarter that has for too long been abandoned.

Keywords: regeneration, architecture, project, abandoned areas, creativity

Cabanyal neighbourhood

The value of El Cabanyal does not lie only in the architectural prestige of its buildings, but rather in the historical testimony of their past (Fig.1).

The small buildings present in the quarter are characterized by extremely simple architecture, with a large variety of colours and in some cases, the original azulejos — typical Spanish architectural ornamentation — are also present. "The history of Valencia is linked to this fishing district. El Cabanyal-Canyamelar became an independent municipality in the 19th century under the name of Pueblo Nuevo del Mar. Today it is still a fisherman's district, the subject of some of the most Costumbrist postcards, depicting traditional scenes, where life goes at a different pace. Its architectural value is immeasurable. In El Cabanyal there are fishing huts and cabins, tiled façades, coloured buildings and modernist structures. From

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Fig. 1
El Cabanyal: pictures of some characteristic views of the neighbourhood. (Author: G.P.).

the Lonja de Pescadores (fish market) to the Grao Market, passing by the houses in the streets of calle Sant Pere, calle La Reina and calle Escalant, and even the area of Progrés and Amparo Guillem. The particular layout of its buildings and its street plans (the passageways are almost maze-like) also create a very authentic social atmosphere and way of life, which has been almost extinguished in large cities. Additionally, in recent years a different feeling has spread out through its streets. The younger generation has turned back towards the beach area, not just to understand its value, but to enrich it with their cultural ideas. As has been the case with other districts around the world, the bohemian sentiment has driven a renaissance. The area now has a network involving art groups and theatre companies with numerous projects on the go. Some good examples are the reopening of the Teatre El Musical (TEM) and the Cabanyal Íntim Festival, a spring event with works in small format, performed in houses of historical interest". Over time various initiatives of high cultural interest have arisen that deal with reintroducing/revamping the neighbourhood under study. "The Cabanyual area of Valencia finds itself in a process of deterioration and in grave danger of disappearing due to the demands of town planning. The Living Cabanyal Archive is made up of a series of interventions which have taken place since 2011: a series of publications; a website ; and the participation of the neighbours as well as the residents of the rest of Valencia and its region. The interventions occurred in different cultural areas, for example in education; anthropology; art; new technologies applied to art and entertainment; theoretical reflections on art; and participation in town planning issues. This project, initiated by the Cultural Association Ésfera Azul, has benefited from economic subsidy from the Spanish Ministry of Culture and from the collaboration of specialists in different fields, as well as neighbours, associations and local organizations. The Living Cabanyal Archive is a project with the fundamental aim of creating awareness in the community about the value of the historical, social and artistic heritage of the Cabanyal area of Valencia".

Relationship between Valencia and the Cabanyal

While the inner 'core' of the city of Valencia was already developed and surrounded by the defensive walls, various settlements of fishermen, in the sea side area appeared. At that time, in Cabanyal, just few houses are already built, the 'barracas' (shacks). "It is necessary to wait until XV century for the neighbourhood to evolve as an independent municipality called 'Poble Nou del Mar'. Both, the historical core and the coastal one, are recognizable as two distinct entities (the coastal settlement also included the bases about the future neighbourhoods Cabanyal and Canyamelar). Due to the industrial revolution, Valencia began an important spread which leads to the ancient walls demolition. A first growth was in 1885 and a second one in 1907 when, due to commercial advantages, the Poble Nou del mar became part of the city, losing its independence. During this period the relationship between coast and city intensified both for trade and for seaside tourism. (**...**). The master plan of 1966 marked a profound turning point for the urban growth of Valencia. The so called 'Plan Sur', launched after the terrible flood that hit the city in 1957, established the derivation of the Turia River. Valencia extended not only in the southern part but also in the northern one with a complete integration between the two cores: urban and coastal. Currently the three main avenues that connect the two cores are: Avenida del Porto, Avenida Blasco Ibanez and the Avenida de los Naranjos."

Origin and evolution of the Cabanyal

The first historical evidence of the coastal settlement dates back to the XII century. King Jaume I, interested in the growth of commerce, will collaborate by building small shack aligned with the coast line. In the XV century the left side of the river was drained. In the early 1600 the Cabanyal consisted of more than fourty barracas and fishermen houses. (…). In 1646 the Grao consisted in 163 houses. Cabanyal and Canyamelar are not important enough to be mentioned (that shows a low growth of the settlement). The neighborhood as we know it today was born in the late eighteenth century. Cabanyal establish its 'role' when the fishing with 'bou' (ox) was forbidden. In the meanwhile the interest of the valencian bourgeoisie for the beaches is growing, with the consequent flow of vacationers during the summer season. Between 1796 and 1875 tehre were numerous fires wich easily destroyed the 'barracas'(shacks). So that it was decided to reconstruct the area with an urban plan created by General Luis de Urbana. Gradually the 'barracas' were replaced by brick constructions. (…). It was in 1700 and concretely with the construction of the church of the Rosary, that the Cabanyal district begins to build its identity".

State of the art

With regard to the state of the art, several case studies of reference were analysed, many of which dealt with the theme of 'building transparency'. The concept of 'transparency' and microperforated walls is very old. The Alhambra in Granada, Spain is a particularly important case. 'The Alhambra is not just any building, but a complex of Medieval and Renaissance palaces and residential courtyards surrounded by a fortress, an alcazaba from the thirteenth century or a walled city with a view of the Sierra Nevada mountains in Spain'.

Here, special note is made of its particular type of 'screening'. "The mashrabiyya (ةيبرشم in Arabic) is a device for natural forced ventilation frequently used in traditional architecture in Arab countries. The reduction of surface area due to the mashrabiyya grid accelerates the flow of air. The effect is accompanied by contact with damp surfaces, basins, or dishes filled with water, which spread the feeling of freshness inside the house. Mashrabiyyas are often present in palaces next to service doors leading to antechambers. Having developed in Islamic architecture, they served primarily to protect women from indiscreet glances. Generally composed of small elements of inlaid wood assembled according to a geometric, often complex, design, a mashrabiyya forms a dense grid often used to enhance windows, loggias, and balconies. The same technique is also used in the construction of furniture known as mashrabiyya ". Other particularly notable examples in which this type of 'screening' is seen include the Aljafería in Zaragoza and the La Zisa palace in Palermo.

The research then turned to modern projects that also exhibit 'filter' solutions for the façade. Among the buildings analysed, the most important include the following. The first is the New Contemporary Museum in New York (SANAA Architects, 2007) (SANAA, 2008). "The location context, Lower Manhattan, with its squared blocks and buildings, can be considered as starting point for the Museum image: it replies the boxes surrounding, and stacks them one on top of the other in various sizes and heights, as the plot was a playground for a composition of cubes. By small but significant shifting of the cubes, the building gets dynamicity and an attracting shape, being different but similar to the near constructions'. Wanting to be a light and clean object in the massive Manhattan cityscape, the materials and the façade appearance play a relevant role. The choice of a layer of anodized aluminium mesh on top of the white walls is not new and unknown to most of architects. But in the Museum it is used as a wrapped skin on all vertical surfaces, as a continuous blurring layer, that gives different light reflections and hides the offices windows, doors and balustrades of the terraces. The result is an elegant, light and

white succession of surfaces, without any interruption or contamination by other elements: a semi-transparent dress for the shifting body of the building".

The second case study is the Sarphatistraat Offices in Amsterdam- Stevan Holl, 2004-(Holl,1998). "In Amsterdam, on the Singel Gracht, the renovated building is a four-story brick 'U' merging internally with a new 'sponge' pavilion. While the exterior expression is one of complimentary contrast (existing brick adjacent to new perforated copper) the interior strategy is one of fusion. The porous architecture of the rectangular pavilion is inscribed with a concept from Morton Feldman's music, 'Patterns in a Chromatic Field.' The ambition to achieve a space of gossamer optic phenomena with chance-located color is especially effective at night when the color patches reflect in the De Single Canal. The layers of perforated screens are developed in three dimensions, analogous to the 'Menger Sponge' principle of openings that are continuously cut in planes and constantly approaching zero volume."

The third case study is the MuCEM (Museum of Civilizations of Europe and the Mediterranean) in Marseille. The perforated panels that enwrap the building create very interesting, original lighting effects. 'A prime symbol of contemporary Marseille, this extraordinary museum investigates the history, culture, and civilization of the Mediterranean region through anthropological expositions, temporary art shows, and documentary screenings. The home of the museum is a daring contemporary building designed by Rudy Ricciotti, an architect originally from Algeria who trained in Marseille. Dedicated to the Mediterranean, the building was designed as a multipurpose container designed to host cultural initiatives, exhibitions, theatre plays, musical performances, and film showings.'

To sum up, for each case study analysed, a particular feature has been highlighted and integrated in the resulting design proposal. About the first one, the New Contemporary museum, the feature selectes is the capacity to shield the interior of the building from the public road creating an intimate atmosphere. About the Sarphatistraat Offices, the feature selected is the capacity to create a luminous architecture, able to strongly characterize the urban space. About the third case study, the MUCEM, the characteristic element selected is the creation of open-air 'filtered' areas like the roof top terrace able to take advantage about the mediterranean temperature and climate.

The architectural project

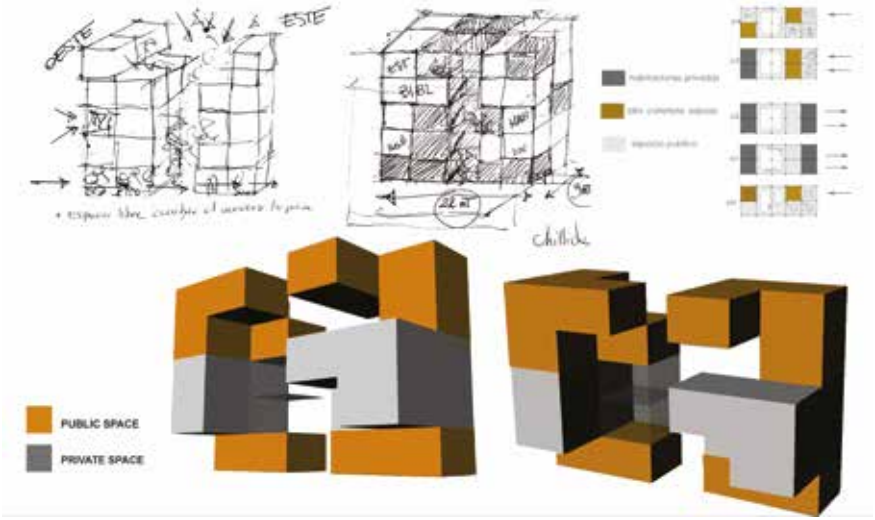
Possible 'urban restoration' of the quarter could be organized into two large projects: the first related to the conservation and restoration of the buildings that are still in good condition and the second related to the design of the abandoned plots. The second intervention would

Fig. 2
St. Mary's Spring after creating stone steps and a small resting area using stone pavement and dry wall technique during the RRC with the CHwB AL. (Source: Personal archive).

regard the design of the decommissioned plots following the partial or total collapse and subsequent demolition of some of the 'remains' of the original housing. The present article relates to this second area of intervention. Indeed, as anticipated, the research proposes a 'filter' type of housing that would be used to rebuild an abandoned plot (22 m x 9.10 m) on Carrer del Pare Lluís Navarro (Fig.2). The architectural project for these abandoned areas is not designed to completely fill the space, which should rather remain 'passable'. The project was carried out in different steps that ultimately led to the development of a concrete proposal. The first step related to a survey and photography of the current state. The object of the photos was not only the plot under study (adjacent to Carrer del Pare Lluís Navarro), but also the most characteristic areas/streets/squares in the neighbourhood (Fig.3).

The second step entailed ideation of the concept. The building addressed in the present work is characterized by the co-existence of different functions, both public and private. In fact, some of the modules are destined for use as common areas such as a library or café (Fig.4). The perimeter terraces of the roof are in turn used as common spaces and miradores. As anticipated, the idea was to confer two different 'purposes' on the building: private housing for students/researchers/scholars or tourists, and public use specifically to enhance the neighbourhood and create a gathering place. The building also lends itself to a public function. Since it is situated in front of a square, it presents an open, privileged view of the Port of Valencia and the Playa de las Arenas, not far from the America's Cup

Fig. 4
The gates are of Dhoksat village. (Source: Archive of the Institute of Cultural Monuments).



Building (also known locally as Veles at Vents, it was designed by the British architect David Chipperfield in 2006). In addition to rooms/mini-rooms for students (independent with their own toilets), common spaces were also considered: reading/study room, bar/café, library/Wi-Fi area (open to the public), and an exhibition room designed for temporary shows (Fig.5). An axonometric drawing was made to show the distribution of these functions within the building (Fig.6). Taking advantage of the flat roof of the building, the idea was also to create an 'elevated' public space usable both by people living there and tourists. The design also recognized the limits of the plot in the present project. Precisely due to the extreme length of the plot, which is closed in by other buildings on the two long sides, the challenge is to design a multifunctional building with heightened architectural quality. The concept consists in initially proposing a single compact volume that is progressively carved out within. In fact, the building as designed is composed of modular units aggregated around a large central green patio that allows in light and air.

The third step entailed the three-dimensional verification of the design. For this purpose, both physical models and 3D digital models (Rhinoeros software) were produced. This phase was fundamental in creating a building that could relate to the surrounding buildings. In fact, it consists not of a single volume, but one that is fragmented, respecting the fragile urban surroundings. Since the building is very 'disintegrated', the height of the adjacent building could be followed exactly to create visual continuity by using one of the highest modular blocks.

Fig. 5
3D Representation about the new project and the relation with sourroundings. Author: G.P.

Fig. 6
Schematic drawing to show the entire volume and the function's distribution. Author: G.P.

As is shown in the 3D model, the starting point was a 'full' volume that was then progressively 'carved out' to generate living spaces within, but more importantly 'spaces' to guarantee the presence of light and air. Just as in sculpture, an initial volume was then 'eroded', progressively removing the 'excess' material. As a guide to the overall design, a large central cavity was created to provide the entire building with natural light and ventilation. Open-air space is a valuable asset in Mediterranean cities with particularly favourable climates, such as Valencia. Each building, but especially public buildings, should therefore consider this element as a priority in the design process. The precise intent was to design and rethink the ancient concept of 'patio' in a modern sense. "Patio, noun, Span. [uncertain etymology]: Inner courtyard typical of Spanish architecture and colonial architecture in Latin America, characterized by a covered space (porticoes and loggias) to access the various areas of the house, and an uncovered space arranged like a garden, with basins and fountains. The term entered common use in Italian and other languages to indicate a similar type of courtyard adopted in villas and country homes". The desire to insert a 'well' of natural light was due both to necessity — limits deriving from the blind lot — and to guarantee energy efficiency and sustainability.

The fourth step was to create two-dimensional CAD drawings (plans, elevations, and sections) (Fig.7,8,9) which were very useful for a more specific verification of the internal distribution of the spaces. This graphical material consists of a location plan, plans in 1:50 scale, and axonometric views of the entire complex.

The fifth step entailed the creation of renderings designed to show both workers and others the transformation of the place (Fig.10). These graphical representations were also essential for further verifying the design of the different spaces. Even from the renderings it

is clear how the heart of the building is the central green space, the core and keystone around which the entire building is structured.

To develope this research, and all the phased described, essential was a previous experience about the reconversion of disused and critical areas located in the sourroundings of Padova, Italy. In fact "the objective of the DATA (Developing abandoned Transurban Areas) project has been to build innovative strategies in terms of sustainable living for the development and economic rebirth of compromised urban areas awaiting regeneration" (Pettoello, Stendardo 2018).

Conclusion

The architectural project is an indispensable tool for rethinking, redeveloping, and enhancing the urban space. Cities often contain 'urban empty spaces', 'scars', residual areas that can and should be turned into strengths. Most European cities have a very high rate of land occupation, so instead of continuing to build new areas around the cities, it is essential to transform these decommissioned spaces into resources in order to return value and quality to the cities themselves. The objective of the present work was therefore not only to design a new

Fig. 7
CAD 2D drawings: layouts of the building. Author: G.P.

Fig. 8
The images shows the two facades of the building and the relation with the sourroundings. On the left side: West Facade. (it is more 'intimate'and 'closed'. On the right side: East Facade. (this facade has a more public aspect. Infact it is more 'open' to create a visual relation with the facing public square. Author of the drawings: G.P.

Fig. 9
Respresentation about: SECTION AA and SECTION BB. Right side: Key Plance reference. Both section highlight the importance of the inner green patio projected. (Software: Autocad and Photoshop). Author: G.P.

building situated on a disused plot in which the old building had been razed, but also to outline a means of intervention that could also be replicated in other similar situations. Of course, in this case, a strong cooperation with the municipality, would be essential, in order to make a larger analysis and deal with possible limits related for example to land ownership. The intent was therefore to transform abandoned plots into resources and creative sparks. Indeed, as designed, the building regenerates the space in which it is

Fig. 10
3D representation of the project: Focus of the new building is the ralation created with the existing buildings. On theright side: 3D section-rendering (Software: 3D Studio Max). Author: G.P.

inserted since it holds architectural value and creates a shared public space. The building is located in a 'stratified' peripheral urban context very rich in history, far from the city center of Valencia and very degraded. For this reason the concept 'reassembles' various architectural characteristics from the past, 'rereading' them in a modern key, such as the idea of the Mediterranean patio and the microperforated screening wall. The proposed building, while a new intervention, therefore 'sinks' its roots into the history of the place where it rises. "The landscape is fragile, cities are fragile, and particularly the peripheries. But the peripheries are precisely the cities of the future, where human energy is concentrated. Large-scale mending is required, along with ideas[1]".

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TOSCAN

EFFECTS OF ABANDONMENT IN THE CITY OF PULA AFTER ITALIAN EXODUS

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Exodus of people from the city of Pula with Toscana steamship.

The Istrian-Dalmatian exodus represented a process of abandonment of 300.000 people due to the transition of Istria, Fiume and Dalmatia from the Italian Reign to the Republic of Yugoslavia. This paper focuses on the exodus from the city of Pula, which occurred after the formalization of the Paris Peace Treaty on 10th February 1947. The abandonment of the city did not happen in a sudden way but it represented the conclusion of a period of time that started after II World War, characterized by a slow and painful preparation to migration.
During these years the protection of monuments was in charge of the Superintendence of Venezia Giulia; until the last moment before the exodus, the Superintendent and the officials architects and archaeologists demonstrated an unequalled energy to complete the restoration of some monuments that were hit by bombs in 1944 and 1945.
Following the exodus, the population of Pula had a very high decrease but gradually the vacant population was replaced by Slavs coming from other parts of the new-born Republic of Yugoslavia. The constitution of a new country led to new institutions and new management; these transformations also interested some monuments that modified their role within the city; in a way, the entire region modified its aspect, starting to be more attractive thanks to tourism and cultural investments.
This paper analyses the process of the conscious preparation to the abandonment of the officials of the Superintendence, the circumstance of the exodus itself, the following consequences of it and the effects of the new politics on the city, focusing on the specific actions that involved the material heritage of Pula.

Keywords: exodus, Pula, material heritage, monuments, transform

Effects of abandonment in the city of Pula after Italian exodus

Introduction

Abandonment is a phenomenon which involves territories and cities at different levels, because it implies material and immaterial aspects of life; the reasons of leaving a place can be various and different, but usually abandonment is caused by traumatic events or social, economic, political changes and transformations. The effects of abandonment can remain evident and be seen for many years within cities, through the lives and experiences of people but also upon the existing and built matter of the city.

This paper aims to focus on the case of the city of Pula, which underwent the abandonment after the Second World War, due to the exodus of part of its inhabitants, because of an

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Fig. 1
CAD 2D drawings: layouts of the building. Author: G.P.

important political and administrative change and a difficult and violent historical background: the analysis will concentrate and put attention on the material heritage of Pula.
The abandonment of Pula did not happen in a sudden way; it represented the conclusion of a period of time that started after the Second World War, with the set up of Morgan Line, the consequent division between zone A and B, the creation of the administration of the Allied Military Government and the definition of Pula as an exclave of zone A belonging to Anglo-Americans within zone B.
Since our interest is focused on heritage, within this context an important role was played by the officials of the Superintendence of Venezia Giulia who cared about monuments, as they led the process of a conscious and difficult preparation for the abandonment in a very skilled way. This paper will also deal with the circumstances of the exodus itself, the following consequences of it and the effects of the new politics on the city, putting attention especially on the specific actions that involved the material heritage of Pula.
The city of Pula is situated on the extremity of Istria, which today is one of the twenty regions of Croatia.
In the last two centuries, XIX and XX, the city was managed by different dominations, but it has always been the administrative centre of the region: following the end of the Republic of Venice and the Napoleonic period, it became part of the Austrian Empire and at the end of the First World War, simultaneously with the disappearance of the Austrian Empire, Istria and other regions as Venezia-Giulia, Quarnaro and Dalmazia became part of the Italian Reign. After the Second World War the situation completely changed

with the creation of the Federal Republic of Yugoslavia. Istria region was divided in two parts: zone A belonged to Allies (American and English forces) and zone B belonged to Yugoslav forces; Pula, situated in the southern part of the peninsula, represented an exception because it was an enclave of Zone A within Zone B from 1945 till 1947. This division of Istria ended with the signing of the Paris Peace Treaties in 1947, when the entirety of Istria became part of the Federal Republic of Yugoslavia. The last transition of administrations happened in a traumatic way since the Italian population had to move away.

The preparation to exodus

During the Second World War, after the armistice of September 1943, Pula was occupied by Nazi forces and it became part of the Operational Zone of the Adriatic Littoral; in order to use some historical places for their own affairs and headquarters, such as the Roman Theatre and the Arena, German soldiers often did not demonstrate attention towards monumental heritage. Due to the German presence in town, Pula suffered twenty raids by Allied: two of these bombings, happened on 22nd of June 1944 and 2nd of March 1945, had devastating consequences on the monuments and the urban fabric: although the entire city was involved in these destructions, three of the main monuments of the city were hit in a dramatic way, such as the Temple of Augustus, San Francesco monastery and the Cathedral.

After the German submission, the pact stipulated in Belgrade on June 9th 1945 defined the Morgan Line which divided zone A under American and English control and zone B under Yugoslav control. From that moment on, the future of Italian population became very uncertain due to the fact that there was a high chance that zone A would also become part of Yugoslavia in the near future; for this reason the idea of exodus immediately came to people and the two years before the effective political change were characterized by a slow but painful preparation to moving. The decision of leaving involved a big number of inhabitants of Pula, because large part of the population was Italian.

During these years, between 1945 and 1947, the conservation and protection of monuments was in charge of the Superintendence of Venezia Giulia, in collaboration with the Allied Military Government (AMG); until the last moment before the exodus, the Superintendent and the officials architects and archaeologists demonstrated an unequalled energy and desire to complete the restoration of some monuments that were hit by bombs in 1944 and 1945 and, in order to preserve heritage, they also reused material coming from already abandoned buildings such as Austro-Hungarian fortifications.

The role of the Allied Military Government, in the guise of the Subcommision Monuments, Fine Arts and Archives and of the Regional Officials, represented a technical support to the

Fig. 3
Poster of Museum of Popular Revolution.

Superintendence of Venezia Giulia but especially an economical support: the estimated cost for monuments paid by the AMG is around six millions lira only in Venezia Giulia region. Every request of financing was ruled by instructions of the AMG and each application had to start from the Superintendent, after being approved by the representative of its Division of the AMG and also from the Public Works Office of the city of Pula. After the pact of Belgrade in which a part of Istria was ceded to Yugoslavia, because of the limited dimension of Venezia Giulia region, the Allied Military Government did not named an exclusive Regional Official but chose the American architect Norman Thomas Newton, who kept his other own offices but he had to visit the region once a month; actually he never went to Pula.

The main character of this period who collaborated with AMG and managed the situation was the Superintendent Fausto Franco, with the valuable help of the vice-superintendent Mario Mirabella Roberti. Since July 1945 he asked for permissions and funding to intervene on main monuments which had been damaged during the war and he was given the opportunity to do so the possibility to do it; the efforts of the Superintendence focused on those monuments which went through big destructions: the Temple of Augustus, San Francesco church and cloister and the Cathedral.

These three monuments suffered a similar treatment during and after the war: in fact they were struck by bombs during some aerial raids by the Allies, undergoing serious damages, and later, regarding the restoration, the choice of the Superintendence pointed towards the reconstruction. The attitude showed the will of taking back the monuments to the images and states they had before the war.

The monastery of San Francesco was hit by a bomb which demolished six arches of the cloister in the north-east corner and damaged internal rooms and the roofs; restorations works started in September 1945 but they were interrupted different times due to lack of materials; the project provided for the reconstruction of the destroyed pillars and for some additions.

The Temple of Augustus probably suffered the worst damage, as the whole front part of the structure collapsed; in this case the reconstruction occurred through the anastylosis. Thanks to the immediate action of the Superintendence, it was possible to reuse and replace in position the original material that has been carefully collected and classified: the columns were re-erected and the capitals were carefully restored; some parts of the building have been restored following rigid scientific criteria but, because of the big number of fragments not all the architectural elements found their previous position.

In the end, the Cathedral of Pula had dangerous losses too; the bomb fell near the base of the left pier of the triumphal arch that, crumbling, caused the collapse of arches and connected columns and a part of the left wall of the basilica. Furthermore, in this case restoration works started quite immediately, proceeding with the reconstruction of the foundation of the broken pillar, of the arches and of the triumphal arch; the latter one was built in bricks but using also old stone ashlars, connected with iron brackets.

The event of exodus

The Istrian-Dalmatian exodus, which happened from 1943 to 1958, represented a process of abandonment, which involved approximately 300.000 people, forced to migrate from Istria, Fiume and Dalmatia, due to the transition of these territories from the Italian Reign to the Republic of Yugoslavia. After a very strong bombardment the migration started from the city of Zara in Dalmatia; later on, it proceeded from Fiume, due to the arrival and the settlement of Tito's soldiers. Although the migrations of people had started some years before, the one from the city of Pula is considered as the real beginning of the Istrian-Dalmatian exodus, probably because of the relevance of the city and how it happened: as previously told, the migration has been prepared for long time and it started some months before the Paris Peace Treaty (10th of February 1947) which was ratified on 31st of July by Italy and entered into force on 15th of September: the treaty formalized the annexation to Yugoslavia of zone B, Pula

Fig. 4
Cinema show in the Arena of Pula during the Festival of Yugoslav Cinema [http://arhiv.pulafilmfestival.hr/].

included, and it defined the Free Territory of Trieste (divided in zone A and B).
The migration from Pula was lived by the population and the public opinion in Italy as a shocking event, because people moved away only by boats and it involved the great majority of the Italian inhabitants of Pula (around 28.000 out of 31.000 inhabitants left the city); it started on 27th of January and it ended on 20th of March 1947, in occasion of the last trip of the *Toscana* steamship.
During the gradual migration, the situation became more and more complicated, in spite of the determination of specialists and people in charge who wanted to carry out the restoration works of the Temple of Augustus and of the Cathedral. Furthermore in the beginning there were some problems linked especially with the finding of materials, but in the last period other problems appeared, such as philo-Slavic strikes of workers and transfers of some of the technical staff from Pula to other Suprintendences all around Italy; in order to efficaciously describe the context, there is a quote by the Superintendent Fausto Franco, found out in one of his missives dated March 1947, which says "I ask to look to future of works like we had unlimited time in front of us; but we always have to be ready to close the construction site tomorrow"[1]; in that period of time all of the

[1] Translation of the author. The sentence in original language is "Prego di guardare all'avvenire dei lavori come seavessimo del tempo illimitato davanti; ma sempre pronti a chiudere il cantiere domani", in Letter of Fausto Franco, 16th March 1947, in Soprintendenza Archeologia Belle Arti Paesaggio Friuli Venezia Giulia, Fondo Istria, b.17, f.690.

concentration and efforts were focused on the site of the Temple of Augustus for this reason, till last moments, the engineer Luigi Peteani, the archaeologist Mario Mirabella Roberti and the architect Gino Pavan worked a lot, used all their time and put their expertise and knowledge to finish the restoration site as soon as possible. In many letters they expressed their anguish if they did not manage to conclude it before the come into effect of the Paris Peace Treaty.

On 15th of September 1947 the restorations works had to stop and the project of the Temple remained partially unfinished; they managed to install the tympanum, the architrave and the frieze but the doors, the floor and the stairs were still missing.

The same condition happened in the construction site of the Cathedral, whose operations management were in the hands of the same engineer Luigi Peteani; the long debate about the demolition and reconstruction of the right wall of the basilica, that showed a big overhang, resolved in nothing; at the beginning of 1947 lack of materials and funding, difficulties in enrolment of manpower, uncertainties about the future definitively caused the suspension of the works.

New politics and the effects on heritage

As anticipated in the previous paragraphs, the exodus of Italian inhabitants finished just before the date of 15th September, when the real political change came into effect. The new administration was the Federal Republic of Yugoslavia, which was divided in six federal republics; the protection of heritage system of Republic of Croatia was organized in three istitutes (Zagreb, Split and Rijeka) and it implicated the hiring of new specialists in charge of protection and preservation of architectural and cultural heritage in Pula; most of them came from Zagreb, where there was already the first Institute of Conservation, whose chief was Ljubo Karaman.

Following some initial problems, the first approaches to the heritage of Pula by these new architects, art historians of the Ministry of Culture occurred in the last months of 1947 by means of trips, surveys and studies.

The travel reports drafted by them showed the first impressions and the first considerations about the city: Pula appeared hardly damaged, with particular reference to monuments but also to urban fabric; despite this aspect, the general overview and idea seemed to be positive, thanks especially to the fascination produced by the beauty of roman and medieval architectures but also to the presence of many interventions on monuments made by Italian staff of Superintendence and architects; the restorations and the attempts to reduce damages were very appreciated. On the contrary Italian fascist architecture was not considered at all and the few examples that are visible in Pula were judged as reactionary and not valid architectures.

The constitution of a new country and the arrival of population led to new institutions, new politics, new management, involving in this process also material and immaterial heritage. These transformations also interested some monuments that modified their role and their functions; in a way, the entire city of Pula and the region modified their aspects, starting to be more attractive thanks to tourist and cultural investments.

Of course, after the exodus, the population of Pula had a very high decrease and it was strongly deserted; but in the following years the vacant population was replaced by Slavs coming from other parts of the new-born Republic of Yugoslavia. Little by little the city started again its normal life: the Yugoslav technicians in charge of heritage noticed that there were many activities of construction around the city, consisting especially in demolitions of bombed and abandoned buildings; for this reason the Institute for Conservation started to protect with the law the main important buildings of Pula, in order to avoid further destructions.

In the immediate post-war period the city of Pula developed a lot in the industrial and tourist field; this advancement was strongly encouraged by the central government of Republic of Yugoslavia, which built a great number of dockyards, glassmakers, textile factories within a general urban development of the country and of some cities in particular.

For example, some big touristic complexes along the coast near Pula were considered as merits of the socialist regime, and they were built in order to respond to the growing demand of visitors. In fact, Istria region changed its vocation from a military role to touristic and industrial ones; in the course of its history Pula has always been a very important transit place in commercial routes during the Republic of Venice, as well as during the Austrian Empire, when it was the main Austrian naval base; also in the Italian Reign it was considered as the main town of the region. The big change happened when this territory entered the Socialist Federal Republic of Yugoslavia: the social and economical context was deeply changed and the vocation of this area was adapted to new necessities; the president Josip Broz Tito made the Brijuni Islands, which are situated in front of Pula, his personal State Summer Residence in order to highlight his power. As a consequence of all these transformations, thanks to touristic villages, hotels and services to travellers, Istria and the area near Pula became the most attractive area of Yugoslavia.

Within this widespread development of the city as an economic, administrative and cultural centre, also monuments were involved in this frenetic use for commercial and touristic purposes; one of the necessity of the new Pula was to reuse monuments in order to make them enter in a wider touristic system of relations.

One example of this behaviour is well represented by the Venetian Castle which has kept the same military function till that moment; in Fifties it was transformed in the Museum of Popular Revolution, in order to assign a political use to one of the main monuments, situated in the highest position of the city.
Another representative case is expressed by the Arena; even though it was used as a theatre for lyric shows already during the Italian Reign, since 1954 it was chosen to host the most important Festival of Yugoslav Cinema; the value of roman architecture increased thanks to the new symbolic role that the Arena has obtained. The Arena became itself a symbol of the Festival, to the point that the prizes for the best films and actors consisted in *Zlatna Arena* a little gold models of the amphitheatre.
Some years later, carrying on the same attitude of exploitation of heritage for touristic uses, some shops and stores were added in the Arena, within some structures built over the roman walls; however this project did not have a big success because it raised up opposite opinions of approval and critics.

Conclusions

Although the concept of exodus always brings along traumatic, painful and dramatic feelings, the migration which occurred from the city of Pula has been lived in a gradual way; the abandonment of Pula by a big part of the Italian population happened when people from Zara and Fiume had already left their homelands and, in a certain way, they managed to prepare psychologically to this event.
Like it has been described above, the preparation to the migration was very slow and continuously uncertain, especially in the case of the technicians who were working on construction sites of monumental heritage, where organization and schedule represented the fundamental basis.
For the people in charge of conservation, the exodus from Pula involved the definitive leaving of houses, jobs, families but also the abandonment of a struggling but symbolic reconstruction against a war which had been totally destructive for everyone.
Phisically the city of Pula has been abandoned for very short time because it was early replaced by other people, another language, other technicians responsibles of the city. And in this transformation monuments were not abandoned, but, on the contrary, played a primary role.

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Cultures pour la conservation et la valorisation du patrimoine à risque d'abandon en Maghreb et Moyen-Orient

VERNACULAR ARCHITECTURE OF THE SOUF REGION (ALGERIA): URBAN MORPHOLOGY, ARCHITECTURAL FEATURES AND CONSTRUCTIVE TECHNIQUE

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Aerial view of Guemar, showing the morphological organization of houses (https://poster-gallery.com/ access on 05/05/2019).

The vernacular architecture of the Souf Oases (Algeria) is based on an unknown and very peculiar building technique, which exploits the local material, *the Desert Rose stone*. Such architecture manifests itself in a unique landscape characterized by a large number of small domes in the desert environment. Indeed, in this context, the lack of wood has not permitted the usage of flat roofs in the entire region; consequently, the used construction technique and the architectural typology are closely linked to environmental resources. This architecture presents different heritage values and the identity of the region is strictly connected to the diffusion of the domes, so much so that the most important urban centre, El-Oued, is called the city of a thousand domes. The present contribution focuses on the history of the region, development of the historic centres and presentation of their values as Cultural heritage included in the Tentative List of UNESCO. Furthermore, the research reports on urban and architectural morphology in order to define the classification of aggregates and buildings. In particular, the building techniques and structural elements have been investigated in situ in order to identify common rules and adopted implementation procedures from exploitation of the local materials to the construction process.

Keywords: desert rose stone, gypsum, domes, building culture, urban morphology, constructive technique

Introduction

The Algerian lower Sahara is a region defined at its southern boundary by the mountainous chain Zab-Aurès-Nememcha and develops northerly next to the Tunisian border. It is a gigantic territory that hosts numerous dispersed entities, among which there is the Souf district, located in the northeast (Figure 1). This region develops in a sandy desert environment, and groups of oases developed during centuries effectively constitute settlements. The system of Oases of the Souf region is in close relationship with the neighbouring systems belonging to the Oued Righ region, the so-called "oasis line" which extends from Biskra to Touggourt in the West; the Chott Melghigh in the North, and the continuous zone of the Sebkhas[1] in the east which joins the Chott Djérid (Fig. 2).

[1] Floodable and salty depression. It is essential element of the semi-desert landscape, the sebkha is a sheet of water and a whitish layer of salt with uncertain and changing shores, depending on the season and the rainfall.

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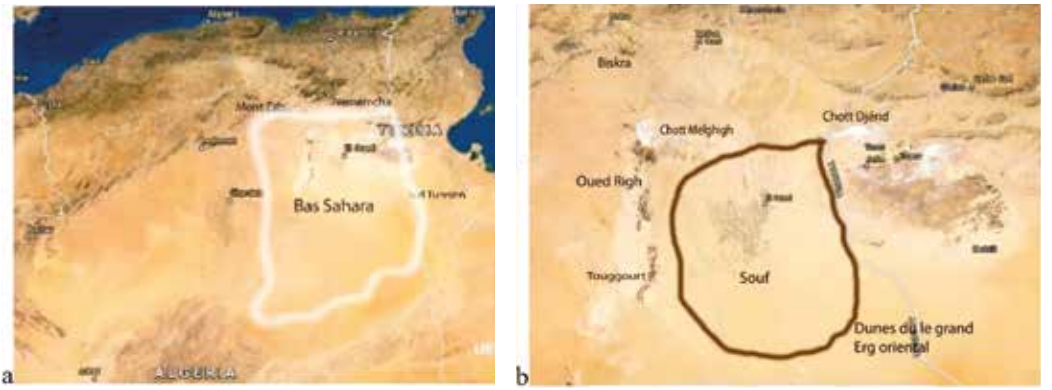


Fig.1
a: Geographical location of the lower Sahara.
b: the geographical location of the Souf region (https://satellites.pro, access on 02/15/2020, modified by author).

The Souf oases are bordered on all sides by the sea of dunes, which stretch above 100 meters in height and extend from the north to the Great Eastern Erg. In terms of geography, this region, approximately 350,000 hectares (Bel & Cuche, 1970), is characterized by the complete absence of any reliefs for human living apart from rugged paths. This characterisation makes the Souf region different from the land that surrounds it (Coté, 2005). The region should be acknowledged for its important historical evolution, which witnesses tangible and intangible cultural heritage values shared by the local population. Inhabitants settled down in the middle of the desert and resisted against the harshest climatic conditions refining and developing a particular way of living through an original cultivation system and unique urban centres. This exceptional cultural landscape is endangered, and adequate preservation policies need to be designed.

Fig.2
a- Satellite image of Ghouts (https://satellites.pro, access on 02/15/2020),
b- an aerial view of the Ghouts (http://www.saravoyages.com/39-El -0ued.htm, access on 06/15/2020).

The historical centres of Souf are endangered by numerous hazards, both natural and anthropic. Regarding anthropic hazards, threats are related to complex social, economic and cultural dynamics. The Souf traditional building culture fails to be acknowledged as an asset and becomes unable to withstand the spread of standardised modern technologies, with the success of legitimate changes in housing models. Many restoration and reconstruction interventions are based on reinforced concrete frames, infill masonry walls (made of hollow bricks), fibreglass roofs and systematic substitution of gypsum with cement. All this allows the creation of environments that tend to align to those belonging to a "modern style" housing model, rejected from the cultural point of view although strongly craved as a symbol of prosperity. A further threat consists of the loss of knowledge of the traditional way of building, which makes consolidation more expensive, up to impossible, than demolition and reconstruction. The lack of interest in traditional


a


b

buildings, and therefore the lack of care and maintenance, paves the way to all the natural threats linked to the severe climatic conditions of the area. In this context, the degrading actions on the built heritage are eased by the particular wall typology which, due to its nature (blocks and mortar of gypsum minerals) and the irregular arrangement, is very vulnerable to external actions. In particular, the main causes of degradation are 1) humidity (due to scarce rain waters but concentrated in a few days and mainly due to the capillary lift of the variable table water level[2] that attacks the gypsum blocks and gypsum mortar that are notoriously susceptible to water; 2) sand and dust storms caused by strong winds that cause erosion and disintegration of protective plaster; 3) freeze-thaw cycles (due to the great difference in temperature between night and day typical of desert areas) that degrade considerably building materials, affecting negatively their behaviour. (Azil, Djebri, Fratini, Misseri, & Rovero, 2020)

Historical context

All of the Souf oases present a variety of heritage values in tangible and intangible terms in their original cultural and natural landscape. The uniqueness of this ensemble manifests in the harmony between the work of human beings and the natural desert context, a balance between human needs and landscape management. To resist against environmental conditions, inhabitants survived for centuries by planting palm trees in the open desert through an original system of culture, the so-called technique of *Ghout*. These systems, the *Ghouts*, are micro-oases that can exist since the cultivation area is created by digging dunes to reach the water table. This arrangement makes it possible to plant palm trees directly above the water table at the bottom of vast funnels dug in the sand. These micro-oases are not based on a geomorphological structure of the territory or the presences of a superficial hydrographic system.

[2] shallow water tables rise since deeper ones are employed to maintain intensive farming of dates.

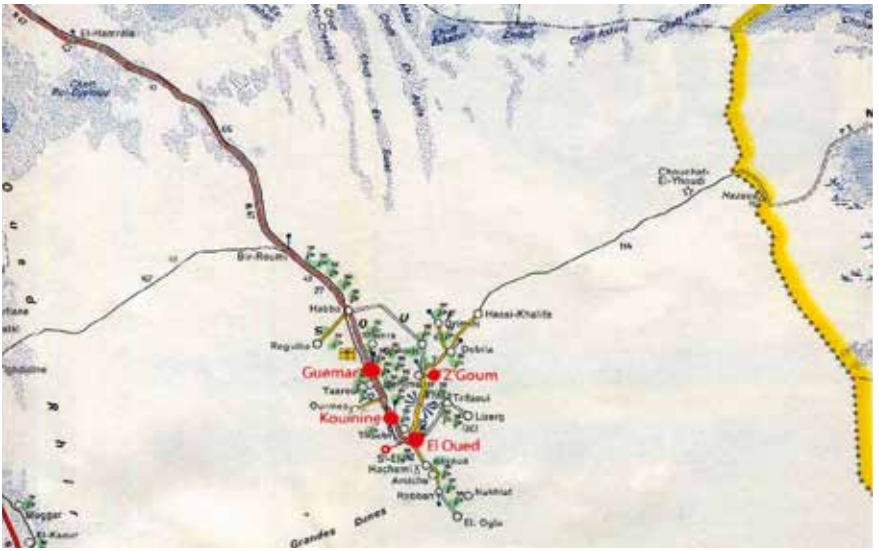
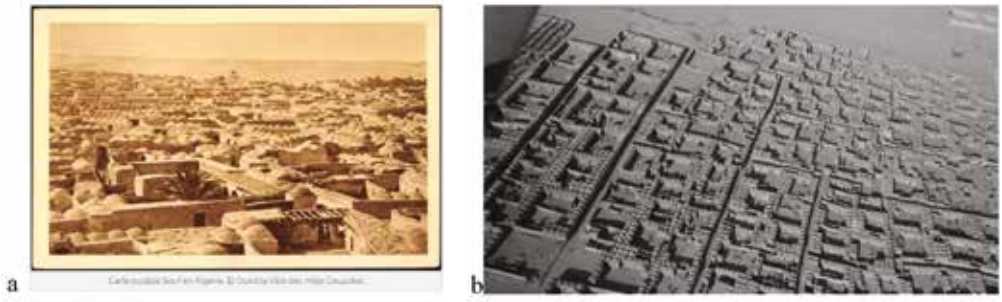


Fig.3
Geographical location of the Ksour in the Souf region. (https://www.nachoua.com/El-Oued/sud-est-algerie.jpg, access on 03/13/2018, modified by author).

Maintenance work on *Ghouts*, especially concerning the protection of cultivations, is hence indispensable as it is impossible to block the continued action of wind and sand. Indeed, installation of artificial palm barriers around *Ghouts* serves to accumulate sand and maintain the protective system of the dug funnels ("Tentative Lists, Oued Souf," 2002). As a consequence of this particular system of creating oases, the natural landscape of Souf is depicted by a suggestive system of green areas protected and surrounded by immense dunes, Figure 2. In addition, the Souf region is known for its natural richness in terms of geology, as it is called the land of the Desert Rose stone ("Tentative Lists, Oued Souf," 2002).

In addition to the natural landscape, also the architecture of the cities of Souf region is different from those of other Saharan regions. Here, architecture defines a unique urban landscape characterized by the use of domes in all traditional constructions. This landscape has been described by several orientalists, which gave the name "the city of a thousand domes" for the capital of the region El-Oued (Ferry, 1951). This character is the result of an intangible heritage made up of the knowledge transmitted from old generations. The marriage between natural and urban landscape is characterized by perfect harmony due to a streamlined integration in the desert environmental context (Azil, Djebri, & Rovero, 2018; Echallier, 1968; Hafiane, 2015).

Fig.4
a. View of El-Oued city.
b. View of Guemar city (https://histoireislamique.wordpress.com/tag/arabes/ access on 02/15/2020).



The apparition of this type of buildings came with the sedentism, which is linked with the foundation of three villages, locally named *Ksour*[3], namely: Zgoum, Guemar and El-Oued, the mosques of which date back to the 16th century (Coté, 2006). This tripod of villages together with the Kouinine *Ksar* (Fig. 3 & 4), constitute the oldest architecture of the Souf region (Coté, 2006; Delaval, 1974). Since their foundations, these *Ksour* have undergone transformations, consisting in expansions and urban and architectural modifications of morphological aspects. As a result, this change affected the original architectural and urban character of the *Ksour* differently from one *Ksar* to another.

Urban tissue and architectural morphology

Analysis of urban and architectural morphology aims to study urban configuration and its relationship with the configuration of architectural entities. Moving from a territorial scale to the building one, this analysis serves to understand, on the one hand, urban landscape and functioning of urban space. On the other, it also makes it possible to identify the architectural elements and their technical, functional and morphological characteristics. This is an important passage for understanding the structure of domed houses and its constituent elements. The historical centres of the Souf Region have similar urban and architectural characteristics (Fig. 5). However, the historic centre of Guemar, although having undergone some modifications, could be considered the centre that preserved more its original morphological character at both the urban and architectural level. For this reason, the centre of Guemar is considered a representative centre to understand urban and architectural morphology of the Souf region.

[3] the *Ksour* (singular *Ksar*) are fortified complexes which extend from southern Morocco to southern Tunisia and which, originally, were built for defensive purposes. Nowadays and with the disappearance of defensive concerns, the *Ksar* designates any Saharan agglomeration formerly built and of rather rural tendency as opposed to the more important structures that are the *medinas* (Coté, 2005)

Fig.5
the urban structures of several cities of the region: a. Laachaache, El Oued; b. Kouinine; and c. Guemar.

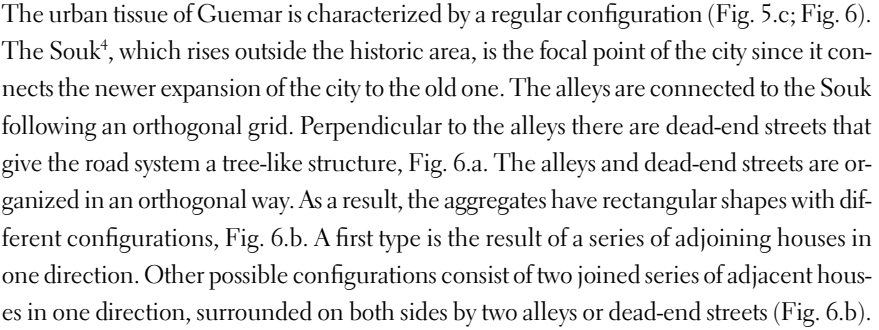
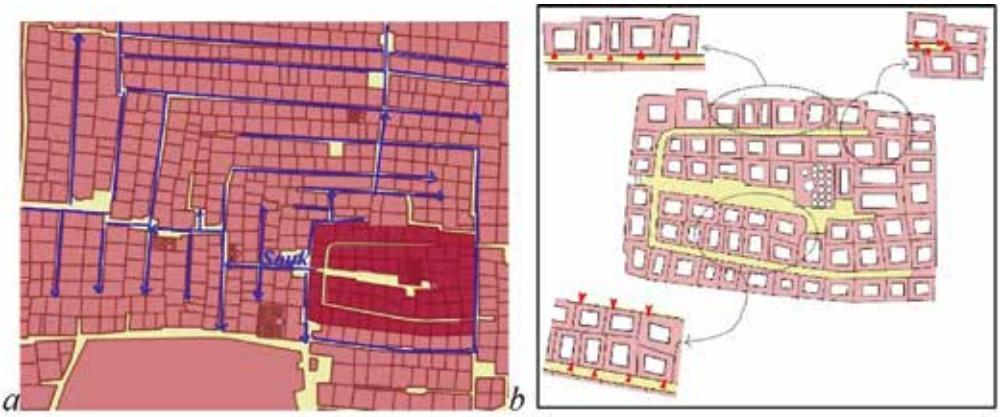


Fig.6
a The morphology of the urban tissue of Guemar city, in dark red, highlighted urban core, in the blue road system, in light red the expansions.
b. The configuration and grouping of houses.

The urban tissue of Guemar is characterized by a regular configuration (Fig. 5.c; Fig. 6). The Souk[4], which rises outside the historic area, is the focal point of the city since it connects the newer expansion of the city to the old one. The alleys are connected to the Souk following an orthogonal grid. Perpendicular to the alleys there are dead-end streets that give the road system a tree-like structure, Fig. 6.a. The alleys and dead-end streets are organized in an orthogonal way. As a result, the aggregates have rectangular shapes with different configurations, Fig. 6.b. A first type is the result of a series of adjoining houses in one direction. Other possible configurations consist of two joined series of adjacent houses in one direction, surrounded on both sides by two alleys or dead-end streets (Fig. 6.b). Consequently, the aggregate can consist of a single or a series of rectangular groupings, Fig. 7.a, b and c. Otherwise, the aggregate can be the results of the joining of more groupings arranged orthogonally; the presence of dead-end streets eases this dense clustering (Figure 7.d). Rectangular aggregate is also characterized by their significant length. In the case of one series of houses, access could be on the main alley or a dead-end street. Alleys and dead-end streets are remarkably narrow, often, only pedestrians can easily walk along with them. Narrow streets in the urban settlements are useful for inhabitants also because this provides shading against the sun, crucial in this desert area (Azil, Djebri, et al., 2020) Although the urban growth of Guemar has developed over several centuries, the types of groupings of houses have remained similar throughout the urban tissue. Aggregate types are the result of the city's growth thanks to the side-by-side repetition of the adjacent houses, which are mainly introverted with openings only towards the central courtyard (Azil,

[4] the area where goods are exchanged



Djebri, et al., 2020; Azil, Djebri, & Rovero, 2019). A squared or rectangular shape is typical for the courtyard, and around it, single-level domed cells are organized (Fig. 8).

The architectural composition of the houses is almost identical throughout the traditional tissue, although mainly two types of arrangement occur. Indeed, courtyard houses can have a continuous or discontinuous line of domed cells surrounding the rectangular or squared courtyard. The domed cells outline the contours of the house (Fig. 9). These domed units are rough squares with edge ranging from 1.8m to 2.5m. A domed cell represents the unity of space and can contain a single-dome unit or a combination of several units. In the latter case, an arched opening instead of a solid wall is put in place to connect the two cells. Variations to the architectural composition of cells around the courtyard consist in the addition of a portico (Figure 9.e). The portico constitutes a single space composed of several cells, which are contiguous to one of the rows of domed cells. From a formal point of view, these two types of combination can be rectangular or square, depending on the dimensions of the construction site (Azil, Djebri, et al., 2020).

Construction processes

Various *in situ* investigations have been conducted in order to identify common rules of the constructive technique and the geometry of houses. The materials available in the deep soil are mined after an extraction process (Lebsir, 2016). The stone employed to erect buildings, namely the desert rose stone - locally called Louz - has a very irregular appearance, and it is used in the form of coarse rubble of various sizes for the construction of foundations, walls and domes (Figure 10.a). All the available materials are exploited: the visible and readily available stones of small dimensions collected from the ground. The stones extracted from

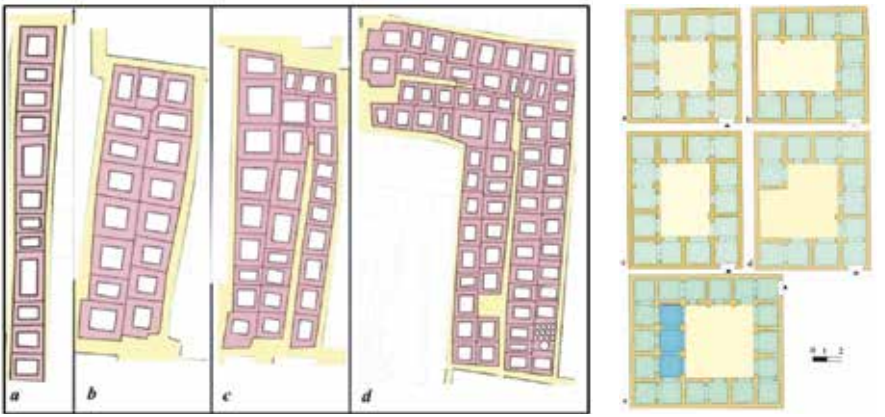


Fig.7
Typologies of urban aggregates.
a) Rectangular aggregate of a single row of houses.
b) a rectangular aggregate of two joined rows of houses.
c) Branching aggregate of two rectangular groupings of houses.
d) Branching aggregate of several groupings of houses in two directions.

depth through a difficult extraction process that requires the use of pickaxes, clamps and dynamite are employed as well (Azil, Djebri, et al., 2020; Azil, Djebri, & Rovero, 2019; Azil, Djebri, Rovero, Misseri, & Tonietti, 2019; Azil, Rovero, et al., 2020; Lebsir, 2016; Najah, 1971).

Regarding the stone used as a raw material to obtain the gypsum binder, the white and coarse-grained stone *Tafza* (Figure 10.b) is employed. The gypsum obtained from *Tafza* stone is used both for grouting and plastering (Azil, Djebri, et al., 2020; Azil, Djebri, Rovero, et al., 2019; Azil, Rovero, et al., 2020; Echallier, 1968; Lebsir, 2016). In order to obtain the gypsum powder, a transformation process requires several steps due to the hardness of the Tafza stone. First, Tafza stone is mined from the deepest layers of the soil. Then, a period of drying of the stone is necessary, since it is in direct contact with the water table. After drying the stones, they are reduced into small blocks. After that, the blocks are burned for two hours in traditional furnaces reaching a temperature ranging around 150-200 ° C, which is sufficient to induce evaporation of water and calcination, so obtaining the calcium sulfate hemihydrate (Azil, Djebri, et al., 2020; Lebsir, 2016). After this step, two days are necessary for the cooked Tafza stone to cool off. Afterwards, these blocks are reduced into powder and during this phase, some wood ashes can accidentally mix with gypsum (Azil, Djebri, & Rovero, 2019; Azil, Djebri, Rovero, et al., 2019; Azil, Rovero, et al., 2020; Bataillon, 1955; Lebsir, 2016).

The Desert rose masonry presents perfect cohesion between stone and bedding mortar of gypsum. This cohesion permits the construction of structural elements (walls and domes) with very irregular blocks of stone and guarantees resistance and stability, which otherwise could be hardly reached without squared blocks and regular texture.

Fig.8
Architectural typologies of houses.
a) Traditional house with a square courtyard with a row of domed cells continued.
b) Traditional house with a square courtyard with a row of discontinued domed cells.
c) Traditional house with a rectangular courtyard with a row of domed cells continued.
d) Traditional house with a rectangular courtyard with a row of discontinued domed cells.
d) Traditional courtyard house with a portico.

Petrographic analysis of a sample, Figure 11, which consists of about 50% of *Desert Rose* stone and 50% of bedding mortar, allows highlighting the perfect cohesion between the two materials. In particular, in the bottom left of Figure 11b gypsum crystals (*Desert Rose* stone) can be observed while in the top right the joint mortar is present. Regarding the *Desert Rose* crystals, each single gypsum crystal includes a large amount of rounded quartz an
d calcite grains with a unimodal distribution (dimensions 200-300 μm). Foundations are made of big blocks of *Desert Rose* stone and bedding mortar consists of gypsum. To erect masonry portions, the quantity of gypsum mortar is remarkable compared to the amount of *Desert Rose* blocks, roughly around one-to-one ratio because of the irregularity of the blocks. Foundations depth ranges from 50 to 70 cm and thickness is between 40 and 45 cm. Growing from foundations, walls are slightly less thick. Generally, walls demonstrate one or two leaves made of medium-sized blocks; to fill the gaps, smaller stones are added. Due to the irregularity of blocks shape, the texture of walls is very irregular; therefore, walls are plastered with a gypsum-based rough-coating. The thickness of gypsum plastering for inside walls varies according to the quantity needed in order to smoothen the surface. Generally, the plaster layer employed for outside walls is thicker, ranging from 5 to 10 cm. In the end, wall thickness varies between 30 and 35 cm (Azil, Djebri, et al., 2020).

Buttresses are masonry sills, with desert rose stone and gypsum, projecting on the exterior elevation of the wall facing the central courtyard and outside the house. They have a trapezoidal shape endowed with a wide base and a narrower top, and sometimes, with an average thickness equal to or less than that of the wall. They make it possible to take the effects of the load and stop the lateral thrusts of the arcades and domes (Azil, Rovero, et al., 2020).

Regarding the domes, masonry execution, which is realized without centring owing to the rapid setting of the gypsum, raises from the square shape and grows in successive horizontal layers that change from squared shape to a circular one, see Figure 13. Consequently, the geometry of the typical dome is that typically a cloister vault with imperceptible edges in the inferior part, and a dome of revolution in the superior part. The dome is slightly flattened: its rise is less than half of its diameter. Domes are also covered by a thick layer of gypsum plaster to smooth the surface both outside and inside. The thickness of the domes ranges between 15 and 18 cm (Azil, Djebri, et al., 2020; Azil, Rovero, et al., 2020).

Conclusion

The typical architectural heritage of the Souf region in Algeria was analysed. This heritage shows vernacular architectures constructed with desert rose stone blocks and characterized by domed roofs. These roofs describe an exceptional urban landscape.

In order to contribute to the knowledge of the architectural heritage of the Souf region, a multi-disciplinary investigation was carried out. In particular, the following investigations were completed:

- historical study of the region
- urban and architectural morphology analysis
- direct geometric survey of a base cell
- study of the construction process
- observation of thin section for mineralogical characterization

The study of the Souf constructive culture allowed to define the urban and architectural typology, preparation steps of the building materials and definition of constructive techniques and geometry of the different structural elements.

Sitography

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A LA MÉMOIRE DE SAINTE CRISPINA. ETUDE DE LA BASILIQUE PALÉOCHRÉTIENNE DE THEVESTE

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Université de Paris-Nanterre-France

Vue sur l'atrium et la nef centrale, par F.Z BOUGHANEM, 12/2018.

The arrival of the Christian religion was one of the defining events of Roman times. In Theveste, historians put it in the period of the 1st half of the 3rd century. Christianity bequeathed one of the most beautiful specimens to African soil by *The Basilica of Saint Crispina*. According to the needs of the Christian community, the building has changed over time. Between monastery, pilgrimage church, or basilica, we still do not know its original vocation.

This basilica holds the name of Saint Crispina who was a matron from Thagura. She was martyred on December 05 of the year 304, in Theveste.

The lack of interest in this basilica, and the absence of research and studies still exist, notwithstanding what it brings archaeological, heritage and artistic values. All of this prompted us to study it, and to highlight it.

In this study, we relied on a comparative study of the current state of the basilica with what had been reported by previous works by bringing together relevant documentary sources. Beginning with the virtual restitution of the monument, which allows the updating of documentary funds, then this will allow the recording of all interventions and alterations relating to the monument through the centuries, to finally obtain a good relevant archival database, which will have the capacity to be, developed, edited, and updated over time.

As upcoming stage, we think of virtual museumification of this heritage using this data in order to preserve it and pass it on to future generations.

Mots clés: christianisme, paléochrétien architecture, Virtual restitution.

Introduction

Siège de la troisième Légion Auguste puis municipe, Theveste, actuelle Tébessa, se situe à l'extrême Est de l'Algérie. Les traces de la présence humaine y remontent à la préhistoire. Plusieurs civilisations s'y sont succédé, mais l'occupation romaine reste la plus marquante. Des vestiges et des monuments en témoignent, comme l'incontournable basilique de Sainte Crispine, objet de cette étude.

L'histoire de l'antiquité Africaine a été marquée par de riches événements. L'un des plus marquants est l'avènement du christianisme. Bien que la christianisation de l'Afrique soit sujette à plusieurs zones d'ombres, les historiens et les archéologues la situent entre la fin du II^{ème} et le début du III^{ème} siècle de notre ère. Le premier indice à ce sujet remonte au 17 juillet

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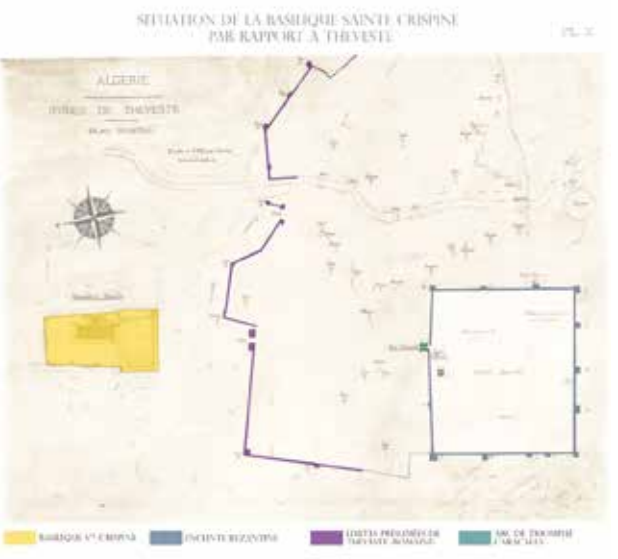


Chronologie d'édification de la basilique Ste Crispine, par F.Z Boughanem.

Emplacement de la basilique p/p à Theveste, modifié par F.Z Boughanem.

de l'an 180. Il s'agit du martyre qu'a subi un groupe de paysans de *Scilli* (les Scillitains) accusés d'appartenir au christianisme (Le Bohec, 2005, p.71).

A Theveste, nous situons l'arrivée de la nouvelle fois au début du III^{ème} s. Cette affirmation est basée sur le déplacement de l'Evêque Lucius de Theveste au concile de Carthage en réponse à sa convocation par l'Evêque Saint Cyprien, en 255, et sur la datation de la galerie des catacombes qui se situe au sous-sol de la basilique, que les archéologues ont attribué à la première moitié du III^{ème} s.

L'ensemble chrétien de Theveste est connu sous différentes appellations, selon Stéphane Gsell c'est une «basilique chrétienne/sanctuaire», tandis qu'Albert Ballu la reconnait comme un «monastère byzantin», alors que pour Noël Duval l'ensemble était une «basilique de pèlerinage». Quelle était la vraie vocation de cet ensemble chrétien ?

La basilique de Theveste est connue sous le nom de «basilique de Sainte Crispine», nous ignorons à quelle date cette appellation lui a été attribuée. Aucune inscription au nom de la sainte n'a été trouvée dans la ville ni dans la basilique, et la seule qui l'évoque a été trouvée à quelques kilomètres de la ville.

Sainte Crispine est une matrone originaire de Thagura, connue par sa foi inébranlable, et longtemps vénérée parmi les saints, à l'instar de Saint Augustin. Elle a subi le martyre à Theveste, le 05 décembre 304 (Lancel, Mattei, Mandouze, 2003, p. 25). Elle a été amenée devant le proconsul Anullinus car elle appartenait à un autre culte que celui de

l'empereur. Le proconsul lui demanda de se conformer aux décrets des empereurs qui prescrivent de sacrifier pour tous les dieux, mais la sainte refusa en ajoutant qu'elle ne sacrifiera qu'à un seul Dieu.

Les faits autour du martyre de Sainte Crispine nous ont été rapportés par plusieurs auteurs et se résument au fait que le proconsul a tenté maintes fois de la convaincre de se repentir et de se soumettre, en vain. Devant son attachement à la religion du Christ, il ordonna de l'exécuter. Elle a été exposée au public après que ses cheveux ont été rasés pour servir d'exemple et de moquerie à la populace, avant que sa tête ne soit tranchée.

La basilique Sainte Crispine entre le passé et le présent

La basilique Sainte Crispine compte parmi les plus beaux spécimens architecturaux de la chrétienté africaine. Serée De Roche, dans « Tébessa, antique Theveste » nous énumère les différents matériaux de construction, qui selon lui témoignent d'une période de grande ferveur. Le sol de la basilique était pavé avec soin de splendides mosaïques, différentes les unes des autres. Il nous renseigne également que la basilique a bénéficié de nombreux dons provenant de la Chrétienté de l'époque.

La construction de la basilique s'est étalée sur plusieurs périodes. Cependant, sa date exacte reste mal établie[1].

L'édification de la basilique a connu, principalement, quatre époques marquantes :

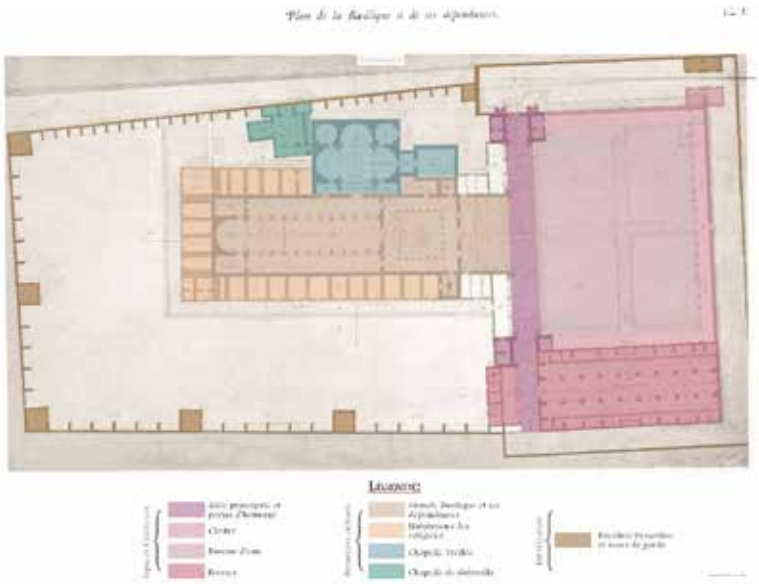
Entre l'introduction du christianisme dans la cité et l'édit de Milan : on ignore où les fidèles pratiquaient la nouvelle fois pendant cette période, mais la crypte qui se trouve au sous-sol de l'actuelle basilique prouve que le christianisme a été bel et bien existant.

Après l'Edit de Milan en 313 : il y eut la construction d'une première église sur l'emplacement de la galerie des catacombes et son autel se trouvait sous l'actuelle chapelle tréflée. Cette église fut démolie après quelques années pour être remplacée par la grande basilique.

Après l'Edit Thessalonique en 380 : l'ensemble chrétien de Theveste comme on le connait aujourd'hui surgit du sol.

L'occupation byzantine : l'apport byzantin à la basilique se limite à sa fortification en créant l'enceinte, le chemin de ronde et les tours de gardes, et probablement la chapelle de Gabinilla.

[1] Selon Gsell, seule la basilique d'Orléans ville, érigée en l'an 324 ap. J. C., a pu être datée sur la base d'une dédicace. En général, on se basait sur la forme des monogrammes du christ, les datations des tombes, des chapiteaux et des fragments, …



Composition de la basilique, modifié par F.Z Boughanem.

Emplacement de la basilique

Erigée ex-nihilo et implantée extra-muros à 600 mètres au Nord de l'arc de Triomphe de Caracalla, la basilique de Sainte Crispine se présente comme un ensemble fortifié contenant une grande église, des chapelles, des écuries, des habitations…

De nos jours, l'ensemble chrétien se trouve à l'extérieur du centre historique, limité par l'enceinte byzantine. Cependant, il reste au centre de la ville moderne de Tébessa, au sein du quartier qui porte son nom « quartier de la basilique ».

La basilique est orientée selon l'axe ouest-est, la façade donnant vers l'ouest, et le presbyterium vers l'est[2]. A l'origine, l'entrée se faisait par une porte au Sud. Aujourd'hui, on y accède par un portail situé à l'est.

L'ensemble est organisé de part et d'autre d'une large voie dallée, qui demeure intacte et conserve ses marques de tâcherons (lettres, figures en forme de croix…). Cette voie divise l'ensemble en deux parties inégales. Au nord, nous trouvons les bâtiments cultuels avec leurs dépendances, et au sud des espaces aménagés à ciel ouvert, et les écuries.

Cette voie est limitée de part et d'autre par deux portes monumentales d'une composition architectonique intéressante. Ce sont les «portes d'honneur», dont seule celle de l'est subsiste de nos jours.

[2] En réalité l'orientation de la basilique est plus proche du nord-est/sud-ouest.

Nous détaillons, dans ce qui suit, les différents composants de l'ensemble chrétien de Theveste:

Les espaces extérieurs

Ils englobent une cour flanquée de postes de service et de surveillance, un cloître, des plans d'eau, et des écuries.

A la limite Sud de cette grande voie, on trouve un escalier qui mène à la crypte souterraine, dont l'accès a été obstrué jusqu'à sa réouverture au mois de décembre 2019. Cette crypte est construite sous forme de galerie avec une succession d'espaces abritant des sépultures avec des mosaïques et des inscriptions. Elle aurait été condamnée lors de la construction de l'éventuelle première église de la ville (Seree de Roch, 1952, p. 43).

Plus des ⅔ de la superficie Sud sont aménagés en un jardin entouré d'une galerie en forme de U, et les écuries occupent l'espace restant.

Quand on accède par le portail principal sud de la basilique, on se retrouve dans le cloitre surélevé de 10 marches. Il surplombe un espace aménagé en 4 parties presque égales, formées par le croisement de deux allées. Ces quatre parties formaient des plans d'eau, entièrement clôturées par des balustrades et des panneaux en pierre. Seules quelques balustrades avec des fragments de panneaux subsistent de nos jours.

A l'ouest du cloître, on trouve les écuries qui ont été pendant longtemps considérées à tort comme des habitations pour les évêques et des catéchumènes.

Construit sur deux niveaux, ce bâtiment accueillait principalement des écuries au rez-de-chaussée et des salles d'emmagasinage des fourrages, litières… au niveau supérieur. Ce niveau n'existe plus aujourd'hui. Néanmoins, les fouilles ont permis de retrouver les traces des escaliers menant à l'étage. Les grands corbeaux de pierre qu'on trouve sur le site témoignent aussi de son existence.

Un second ilot de deux écuries, de taille réduite, existe de l'autre côté de la voie principale, son entrée est marquée par un portique de 6 colonnes. On suppose que ces écuries étaient réservées à des coursiers de luxe.

La grande basilique

Au nord de l'allée principale, se dresse la majestueuse basilique. Elle est surélevée par un escalier monumental de 16 marches, et précédée par un portique de 8 colonnes. Aujourd'hui nous ne connaissons que leurs bases.

Le portique donne accès à l'atrium qui dessert l'église d'un côté et le baptistère de l'autre. De part et d'autre de l'entrée de l'atrium, deux tours d'escaliers s'élevaient. Elles assuraient

Vue sur les espaces extérieurs prise de l'atrium, par F.Z Boughanem, 12/2018.

l'accès au premier étage de l'atrium et aux bas-côtés de la basilique (Ballu, 1886, p. 18).
Au centre de l'atrium nous trouvons une fontaine d'ablutions, existante encore de nos jours. Au fond, on trouve le narthtex, adossé au mur de la basilique (Ballu, 1886, p. 18).
Les trous de pivots des vantaux des portes sont toujours visibles.
Sur le côté droit de l'atrium, se trouve le baptistère, on y descend par 3 marches. C'est une salle exiguë qui conserve sa cuve baptismale de forme hexagonale, presque intacte, garnie de degrés qu'on descendait pour subir l'immersion. Il convient de préciser que le relevé de la cuve baptismale établi par Ballu n'est pas identique à son état actuel[3].
Le bâtiment de la basilique mesure 46m de long par 22m de large. Sur le plan architectural, il est conforme au prototype des basiliques antiques, avec une nef centrale et deux collatérales.
On y accède par la porte royale qui donne sur la nef centrale qui mesure 8 m de largeur.
Les deux bas-côtés sont plus étroits, et sont destinés à recevoir les fidèles, hommes à droite et femmes à gauche.
Au fond de la nef centrale, le presbyterium est surélevé de trois marches.
Au bout de chaque bas-côté, se dresse une pièce qui remplissait les mêmes fonctions que les sacristies modernes. Elles sont également accessibles depuis le presbyterium.
Au niveau du sol de la nef centrale, nous pouvons distinguer l'empreinte de l'autel. Il était entouré par des chancels en pierre maintenus par des pilastres carrés surmontés de fleurons (Ballu, 1886, p. 20).

Plan de la cuve baptismale,par A. Ballu.

[3] On note l'existence de 2 degrés en dessous du niveau de sol contre 3 sur le relevé. La limite extérieure du premier degré est de forme hexagonale avec quelques saillies, et n'est pas à ras du sol.

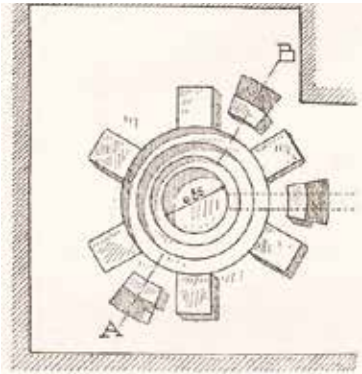


Fig. 11. — Plan de la cuve baptismale.

altération sa cuve baptismale disposée,

Fig. 12. — Coupe de la cuve baptismale.

l'usage de l'époque, au niveau du sol et g
degrés qu'on descendait pour subir l'immersi
11 et 12). Comme pour la *phiala* de l'Atrium
lement des eaux était assuré par une cana

Les parois des nefs étaient décorées avec des mosaïques et des peintures. Quant à la toiture, on ignore comment elle se présentait exactement.

Selon l'étude d'Albert Ballu, l'église se composait de trois étages de colonnes superposées :

Les deux premiers sont de style romain et ont des hauteurs presque égales.

Le troisième est un étage d'attique, tout entiers de style romano-byzantin. Les colonnes étaient surmontées de chapiteaux qui portaient directement des corbeaux.

En termes de décors sculptés et symboles chrétiens, le motif du poisson est l'un des plus fréquents.

Les cellules et habitations des religieux

Vingt-trois habitations pour les religieux et l'évêque sont disposées sur un seul niveau, et se situent sur le bas-côté ouest, l'arrière, et la moitié du bas-côté est de l'église. En analysant les relevés, les plans restitués, ainsi que le site, nous ne trouvons pas de traces d'une vie communautaire, telles qu'une salle commune pour les repas, une cuisine, ou encore des latrines. Ceci nous éloigne de l'hypothèse qui veut que l'ensemble chrétien soit un monastère.

La chapelle tréflée

La chapelle tréflée, appelée triforium par Ballu, et martyrium par Duval, est une chapelle à trois absides semi-circulaires identiques, couvertes en demi-coupoles et fermées par des arcs. On y accède par des escaliers depuis le bas-côté est de la basilique, ou de plain-pied directement de l'extérieur.

La chapelle, ainsi que les salles adjacentes, accueillent un ensemble funéraire (Ballu, 1886, pp. 29-30):

Vue sur l'atrium et la nef centrale, par F.Z Boughanem, 12/2018.

Vue sur la chapelle tréflée, par F.Z Boughanem, 12/2018.

L'abside centrale : un ensemble de tombes chrétiennes recouvert par une mosaïque funéraire.
L'abside gauche : des tombeaux d'enfants païens, retrouvés à 3 m 50 de profondeur
L'abside de droite : des sarcophages.
Au centre de la chapelle on reconnait les traces d'un autel. Le sol était recouvert de mosaïques disparues aujourd'hui.
Les fouilles entreprises par le commandant Sériziat, en 1868, ont permis de découvrir un sarcophage de marbre d'un grand intérêt artistique. Actuellement, il sert d'autel pour l'église moderne de la ville.
L'abside de droite communique exclusivement avec deux salles voûtées. Dans la plus grande salle, on a découvert sous les mosaïques quatre sarcophages dont trois d'entre eux ont été fouillés. Le plus important était celui de l'Evêque Palladius[4].

La chapelle de Gabinilla

Elle occupe l'angle formé par la chapelle tréflée et les cellules des religieux du bas-côté Est. Elle est contiguë à l'enceinte byzantine, et occupe l'intervalle de quatre contreforts de celle-ci.
Cette petite chapelle mesure 8m 90 de large sur environ 11m de long. Elle est organisée selon le modèle d'une petite église avec une abside semicirculaire, orientée sud-est.
Cette chapelle est connue sous le nom de « Chapelle de Gabinilla ». Elle doit son appellation à une femme *Celia Domitia Gabinilla* mentionnée sur une inscription en mosaïque, découverte près de l'autel de cette chapelle (Seree de Roch, 1952, p. 55). L'inscription est ornée d'un chrisme accosté de l'alpha et de l'oméga.

[4] Les restes de l'évêque ont été trouvés, avec la chevelure intacte, reposant sur une couche de feuilles de laurier.

L'enceinte byzantine

De la forme d'un quadrilatère, l'enceinte assurait la protection de l'ensemble chrétien, elle était couronnée d'un chemin de ronde, et flanquée de 6 tours de garde, disposées du côté opposé à Theveste. Les fortifications de la ville garantissaient la sécurité du flanc sud.

Conclusion

Ce succinct survol historique nous permet de mieux comprendre la chronologie, les étapes historiques d'édification et les modifications en rapport avec les vestiges de l'ensemble chrétien de Theveste.

Il nous a permis également de comparer l'état actuel de la basilique à l'état rapporté par plusieurs travaux antérieurs, dont principalement l'étude entreprise par Albert Ballu.

Actuellement, la basilique conserve le même état en dehors des détériorations et des changements ordonnés par la direction de la culture de la ville de Tébessa. Parmi les griefs retenus, on cite principalement le déplacement des mosaïques vers le musée de la ville, l'emploi de matériaux inappropriés pour la réfection de la clôture, l'irrespect des lois relatives aux interventions sur les sites historiques, la réouverture de la galerie des catacombes sans étude spécialisée préalable…

Bien que la basilique soit classée monument historique, depuis 1982[5], aucun périmètre de protection ni règle d'aménagement spécifique aux ensembles patrimoniaux n'ont été imposés.

Aujourd'hui, les ruines de la basilique ne sont pas assez valorisées et respectées par les habitants. Les autorités ne mènent aucune action concrète pour la conservation de ce legs. Le dernier projet de mise en valeur de la basilique, qui date de l'an 2009, n'a pas été concrétisé.

Notre ambition est de réaliser une restitution virtuelle qui soit la plus proche possible de la réalité, avec une démarche conservatrice et valorisante, dont le but est de mettre en valeur ce leg, et le transmettre aux générations futures à travers des plates-formes et des supports numériques.

[5] Arrêté du 19/10/1982 portant classement de la Basilique de Tébessa parmi les monuments historiques, in *Journal officiel de la République Algérienne Démocratique et Populaire, N° 48*, 30/11/1982, Alger, p.1548

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L'ARCHITECTURE TRADITIONNELLE DES VILLAGES PERCHÉS DU CENTRE-NORD TUNISIEN: LE CAS DE ZRIBA EL-ALIA

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Università degli Studi di Firenze-Italia

Portail avec seuil (*'atba*) et piédroit (*snad*) monolithiques en pierre.

The traditional construction of perched villages represents a typical architectural heritage of northern Africa. The Berber villages of Zriba el-Alia, Takrouna Sidi Medien and Jradou, which probably date back to the Middle Ages, are built on rocky reliefs dominating the plain of north-central Tunisia. The original architectural features and common traditions link these four villages. Each village is home to a small mosque and a mausoleum dedicated to Sidi Abd al-Kadir Jilani, the country's most prominent saint. These religious monuments served as Koranic schools where young villagers learned to read and write. They are built, in part, with architectural elements from ancient archaeological sites in the surrounding area. Today, these villages are historical complexes rich in tangible and intangible heritage. The local traditions related to the daily life of the inhabitants and their customs are, unfortunately, forgotten and very little known. The reading and the valorization of the historical site through the architecture and the know-how of the people reflect the richness of the heritage still partially preserved in this territory.
Based on the morphological study and on the historical and graphic documents of the sites analysed, the present work aims at highlighting a particular and little-known Mediterranean architectural heritage, in the hope of cultivating the memory of those distant messages of stone that are important inasmuch as they tell a story, arouse emotion, provoke reflection, thus becoming emblematic witnesses to the life of the monuments to which they belong.

Mots clefs: Architecture méditerranéenne, Villages perchés, Tunisie, Architecture traditionnelle

La construction traditionnelle des villages perchés représente un patrimoine architectural typique de l'Afrique septentrionale. Les bourgs berbères Zriba el-Alia, Takrouna, Sidi Medien et Jradou sont bâtis sur des reliefs rocheux dominant la plaine du centre-nord de la Tunisie. Les caractéristiques architecturales originaires et les traditions communes lient ces quatre villages. Chacun abrite une petite mosquée (*masjed*) et un mausolée (*zawiya*) dédié à Sidi Abd al-Kadir Jilani, le saint le plus présent en Tunisie. Ces monuments religieux ont joué un rôle d'école coranique (*kouttab*) où les jeunes villageois apprenaient à lire et à écrire. Ils sont construits, en partie, avec des éléments architecturaux de remploi provenant des sites archéologiques antiques des alentours.
Ces bourgs, occupés probablement depuis l'antiquité (Djelloul 2001, p. 48), constituent aujourd'hui des ensembles historiques riches de patrimoine matériel et immatériel. Les

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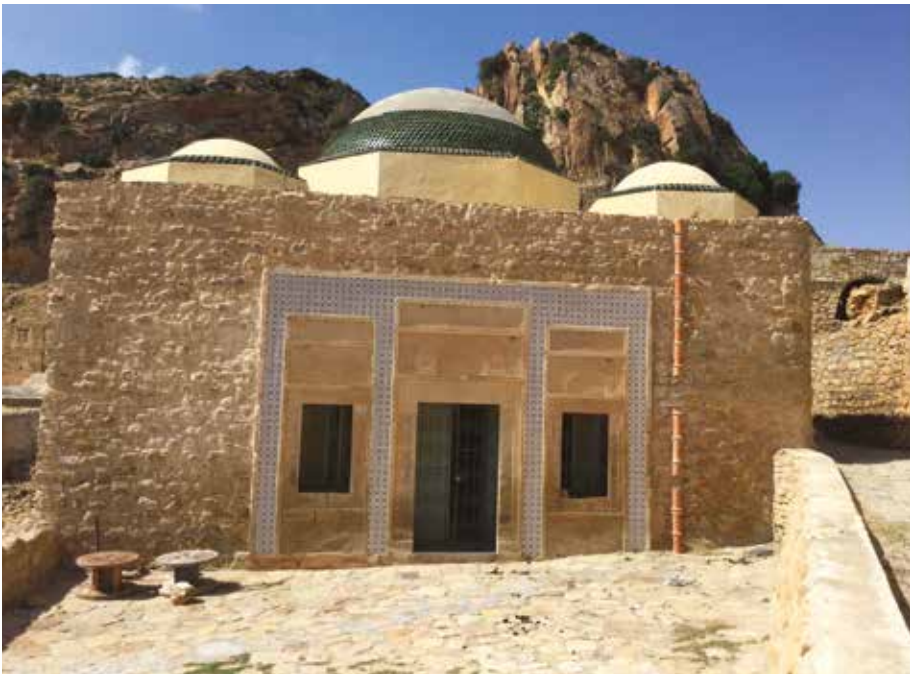
Vue générale du village Zriba el-Alia.

Zawiya Sidi Abd al-Kadir Jilani.

traditions locales liées à la vie quotidienne des habitants et de leurs coutumes sont, malheureusement, oubliées et très peu connues. La lecture et la valorisation du site à travers l'architecture et le savoir-faire des gens (fabrication de la céramique traditionnelle, tissage des tapis berbères, production traditionnelle de savon vert et fabrication de cordages, de paniers et de tapis en alfa) reflètent la richesse d'un héritage encore partiellement conservé dans ce territoire.

Les villages d'origine berbère ont été désertés par leurs habitants dans les années soixante, après le développement des nouvelles villes dans la plaine. Cependant, l'abandon de ces agglomérations a permis la préservation de leur caractère authentique (la mise en œuvre de manière ingénieuse des pierres et des briques et des plafonds en voûte en berceau). Les maisons sont construites en pierres de petites et moyennes tailles et s'articulent autour des petites cours intérieures (*wust al-dar*). Au-delà de leur aspect esthétique, elles présentent de nombreuses qualités. En effet, sur le plan climatique, elles introduisent une parfaite maîtrise de la forme, du matériau et de la gestion des aérations, pour obtenir un bâtiment frais en été et confortable en hiver. Certaines façades ont conservé leur enduit portant des motifs décoratifs spécifiques à cette culture traditionnelle aux origines



antiques. Ces ornements peuvent être simplement réalisés avec des peintures de couleurs ou constitués avec de petits moulages réalisés en relief ou en retrait (motifs en poisson, étoile et croissant de lune). La plupart des maisons, en ruines, sont éparpillées tout au long des ruelles principales. Ces demeures sont installées entre les rochers et réparties en quartiers correspondant aux grandes familles (les tribus). Au milieu de chaque bourg, se dresse le quartier principal, groupé autour de la petite mosquée et du mausolée du saint patron du village.
Actuellement, on trouve encore quelques bourgs habités et entretenus (exemple le bourg de Jradou). Le savoir constructif traditionnel est essentiellement détenu par les anciens des villages qui n'ont pas pu transmettre la totalité de leur savoir aux jeunes qui partent travailler ou étudier en ville. On assiste alors à une rupture des connaissances techniques de l'art de bâtir de ce genre de patrimoine architectural local. En fait, ces agglomérations témoignent des racines communes d'un mode de vie et d'une habileté technique dans une diversité culturelle qui reste encore à étudier de façon systématique. En Tunisie, la culture architecturale traditionnelle est riche et variée selon l'époque, la situation géomorphologique, les matériaux utilisés et la fonction de chaque bâtiment qui témoignent d'un mode de vie et d'une compétence technique singulière.

Vue de la mosquée.

Salle de prière du *masjed* avec le minbar e le *mihrab*.

En se basant sur l'étude morphologique et sur les documents historiques et graphiques des sites analysés, le présent travail vise à mettre en valeur un patrimoine architectural méditerranéen particulier et méconnu, dans l'espoir de cultiver la mémoire de ces lointains messages de pierres qui revêtent une grande importance. Ces sites racontent une histoire, suscitent une émotion, provoquent une réflexion, devenant ainsi des témoins emblématiques de la vie des monuments auxquels ils appartiennent.

L'agglomération de Zriba, fait partie du gouvernorat de Zaghouan situé au nord-est de la Tunisie à 68 Km de la capitale Tunis, dans le bassin versant d'oued Hammam. Cette région se caractérise par des reliefs accidentés au cœur d'une plaine assez vaste où se situent Zriba Hammam, Zriba village et Zriba el-Alia. Elle est une destination du tourisme local vu la présence du centre thermal (*Hammam Zriba*) et bénéficie donc d'une situation assez privilégiée, ce qui renforcerait son rôle urbain et économique par rapport aux autres villes de la région.

Zriba el-Alia se caractérise par son aspect rural et défensif, semblable à une forteresse surplombant les montagnes de djebel Zaghouan, djebel Sidi Zid, djebel Sidi Salem et les plaines qui entourent les régions d'Enfidha et Zaghouan. Elle s'implante sur des

pentes relativement fortes entre deux pitons rocheux où les maisons s'accrochent à la colline et offrent une vue magnifique sur la chaîne montagneuse. Le site occupé depuis l'antiquité, a été sommairement mentionné au milieu du XIIe siècle par le célèbre géographe arabe al-Idrisi «Les flancs de cette montagne [de Zaghouan] sont fertiles, ensemencés et peuplés en certains endroits de musulmans non mêlés (avec d'autres races)» (al-Idrisi, 1983, p. 270). Plus récemment, dans la première moitié du siècle dernier, leur présence a ensuite été confirmée par l'orientaliste français Robert Brunschvig: «Sur sa montagne [Zaghouan] étaient épars, aux XIIe et XIIIe siècles, des ermitages musulmans» (Brunschvig, 1940, p. 303). Vers 1960, les habitants ont migré vers des maisons modernes dans un nouveau bourg "Zriba village" à 5 kilomètres plus bas. L'ancien village abandonné, où actuellement seule quatre ou cinq familles vivent encore, est en ruines et en mauvais état de conservation. Le noyau central, constitué d'un tissu assez dense, s'organise dans une zone fortement accidentée autour de la *rahba* qui est située à l'intersection de deux axes principaux.

Il est important de souligner que l'architecture du village de Zriba el-Alia est réalisée dans un paysage hostile et constituée, dans sa totalité, de pierre locale. Dans son ensemble, le site se

Ruelle principale menant à la partie haute du village.

révèle très suggestif et intéressant, suscitant une série de réflexions sur les matériaux et les techniques utilisées qui permettent des observations utiles sur les dynamiques d'abandon et de détérioration des structures. Les racines berbères sont évidentes à travers les caractéristiques morphologiques et techniques des maisons qui surplombent les ruelles étroites et tortueuses, voire labyrinthiques. Les maisons, toutes pavées de pierres incertaines de taille moyenne, sont positionnées directement au-dessus du sol naturel afin de constituer un support solide. Pour l'approvisionnement en matériaux, les habitants comptaient exclusivement sur les composants naturels du lieu qui étaient utilisés dans les constructions, tels que les pierres, la chaux et le sable.

Petites maisons en pierre bâties sur les flancs de la montagne.

Le matériau en pierre était extrait à proximité du chantier, directement de la roche affleurant de la pente, en utilisant des coins en fer, des maillets, des barres à mine et des pics de carrière, pour être ensuite trié et divisé en piles selon la taille et transporté sur le site avec des ânes ou des mulets. La terre généralement argileuse, tamisée avec un gros maillage pour éliminer les restes végétaux et les petites pierres, est mélangée avec de la chaux et de l'eau puis utilisée comme mortier pour la construction des murs faits de blocs grossièrement taillés avec des outils très simples, comme la hache plate et divers

burins. Souvent, la pierre incertaine, fixée avec très peu de mortier, est rendue plus stable en insérant de petites cales de pierre dans les joints positionnés de manière à colmater les grands interstices qui se créent dans les murs.

Plusieurs maisons utilisent comme base le même banc de roche calcaire affleurant. Les fondations dépendent de la nature et de la conformation du sol. Vu le manque d'affleurements rocheux sur le site, l'excavation est effectuée jusqu'à atteindre une couche solide; s'il y a des bancs de pierre, la préparation des premières couches d'appui est constituée par la régularisation du matériau de la pierre au moyen de coupes appropriées et de remblais de terre à l'aide de flocons de pierre compactés. Dans certains cas, les parois se conforment au profil de la roche émergente. La construction des quatre murs édifiés pour les niveaux isométriques semble durable même si parfois les murs d'enceinte étaient érigés individuellement et maintenus ensemble uniquement par les toitures.

L'utilisation des arcs surbaissés et des voûtes en plein cintre, ils étaient assemblés avec des pierres fines à peine taillées dont l'exécution dénote une bonne mise en œuvre qui avait lieu avec un système très simple constitué d'une cintre de bois, grossièrement faite, soutenue par

Portail en pierre d'une maison traditionnelle.

Cour intérieure d'une maison avec des chambres voûtées.

une série de montants en bois ou bien de poteaux porteurs plus épais. Les voûtes étaient rarement réalisées en briques. Pour construire des murs il est clair qu'on tenait compte de la position des portes et des fenêtres qui était presque toujours symétrique. Les ouvertures étaient réalisées avec des pierres de taille mieux travaillées pour faciliter l'installation des cadres en bois d'olivier. Il y a souvent des seuils (*'atba*), des piédroits (*'adhada* ou *snad*) et des linteaux (*sakif*) monolithiques en pierre qui jouaient un rôle important dans la stabilité des éléments muraux.

L'abandon des bâtiments a causé la perte d'une grande partie de l'enduit (*lika*). Les quelques éléments qui restent permettent des observations utiles pour comprendre les modes de construction qui nous sont parvenus avec peu de modifications qui risquent de disparaître avec le temps sans laisser de traces significatives. L'enduit, fait de mortier de chaux avec du sable de rivière prélevé sur une courte distance, était produit sur place à l'aide de fours spéciaux construits autour du site. Comme on peut encore le voir aujourd'hui sur certaines surfaces, cela servait à enduire les murs ou à étendre une couche de pâte sur les toits afin d'assurer une bonne étanchéité. L'historien Ibn Khaldoun a décrit en détail cette technique utilisée dans l'architecture traditionnelle tunisienne et

aussi dans les autres pays du Maghreb : «Une autre technique consiste à revêtir les mur de chaux. Celle-ci est d'abord diluée et laissée à tremper pendant une semaine ou deux, pour atteindre son point d'équilibre, en perdant l'excès de chaux vive qui l'empêcherait de tenir. Quand l'ouvrier juge qu'elle est prête, il l'applique sur le mur, en commençant par le haut, et la frotte jusqu'à ce qu'elle colle» (Ibn Khaldoun, 1997, p. 641). L'enduit à la chaux joue un rôle déterminant comme élément de protection du bâtiment et de revêtement, ce qui permet d'obtenir des surfaces suffisamment planes, régulières et faciles à peindre. Des sections d'enduit à la chaux coloré en bleu se trouvent dans certaines pièces aussi bien à l'intérieur qu'à l'extérieur des maisons du village.

Les habitats de Zriba el-Alia, en partie creusés dans des parois rocheuses, sont constitués de petites maisons traditionnelles qui ont préservé leur caractère authentique. De loin, on a du mal à distinguer les bâtiments car ils sont en harmonie avec la structure et la couleur du paysage environnant. Tous les plans des différentes maisons s'avèrent très semblables: autour de la cour intérieure, il y a des chambres voûtées (*ghorfa*, pl. *ghoraf*) disposées au rez-de-chaussée. La forme de la cour dépend des besoins du site et de l'espace réservé à la maison. Elle

Détail d'enduit (*lika*) à la chaux coloré en bleu à l'intérieur d'une chambre (*ghorfa*) voûtée.

Chambre creusée dans les parois rocheuses.

peut être de forme rectangulaire, carrée ou irrégulière. Les chambres, du moins en ce qui concerne la principale, sont orientées vers le sud et l'est. Certaines conservent encore le banquet typique, "*dukkana*", généralement utilisé comme lit et formé d'une structure en pierre élevée à environ 30 à 40 centimètres au-dessus du niveau du sol.

De l'extérieur, les murs n'ont aucune ouverture à l'exception de la porte d'entrée. Certaines maisons comportent un couloir, "*driba* ou *skifa*", qui mène à la cour; d'autres maisons ont des pièces disposés sur deux niveaux et dont le rez-de-chaussée est utilisé pour les réserves alimentaires, "*bit el-mouna* ou *makhzen*", qui permet de conserver de manière naturelle les produits qui y sont déposés (blé, huile, viande séchée "*Kadid*", semoule, etc.).

Parfois la maison traditionnelle du village comporte un dépôt externe en maçonnerie souvent découvert et exploité non plus comme entrepôt pour la nourriture mais comme lieu de stockage de matériaux de construction. À partir des différents édifices en pierre à l'état de ruines, il est encore possible d'observer la technique de construction reposant sur l'assemblage des blocs mis verticalement avec certains éléments de forme plus allongée et plate disposés à l'horizontale pour permettre un meilleur support. À l'extérieur des

vieilles maisons de Zriba el-Alia, apparaissent des éléments pour animaux tels que des abreuvoirs et des mangeoires.

À part les maisons traditionnelles, le village contient quelques monuments importants : des places, une *zawiya qaderiya* et une petite mosquée.

La *zawiya*, construite au XVIIe siècle, a servi d'école coranique (*Kouttab*) pour les jeunes du village. Récemment, elle a fait l'objet d'une restauration très poussée et abrite des éléments architecturaux antiques. Le bâtiment, en face d'une place importante, est de forme cubique et se compose d'un seul étage avec un toit composé de cinq dômes dont le central est plus grand que ceux des quatre angles. La façade est caractérisée par une porte d'entrée centrale flanquée de deux fenêtres symétriques. L'ensemble est encadré par des corniches en relief et des panneaux en céramique avec des motifs géométriques.

À un emplacement plus élevé, se trouve le *masjed*, situé à quelques dizaines de mètres au nord de la *zawiya*. Même l'ancienne mosquée, qui remonte probablement à la même date que le mausolée, a subi une intervention de reconstruction récente et déterminante qui a entraîné la perte des caractéristiques originales des matériaux et des techniques de construction. L'édifice comporte une salle de prière composée de trois nefs parallèles au mur de la *qibla* et couverte de voûtes en berceau en briques. Les arcs en plein cintre en pierre travaillée s'appuient sur des colonnes et des chapiteaux réutilisés qui sont probablement d'origine ancienne. Le mur de la *qibla* est interrompu dans la partie centrale par un *mihrab* de forme semi-circulaire creusé à l'intérieur de l'épaisseur de la paroi. À droite de la niche, il y a un *minbar* en pierre, composé de cinq marches, qui repose sur le mur ouest de la salle de prière. Enfin, un minaret crénelé de forme carrée est placé dans l'angle nord-est, haut de quelques mètres par rapport au sommet du *masjed*.

Les habitants du village vivaient essentiellement de l'agriculture et de l'élevage ainsi que du tissage de l'alfa et de la fabrication de la poterie dans laquelle les femmes ont joué un rôle important. C'est justement dans la civilisation berbère qu'est né le modelage de la céramique pour répondre aux besoins quotidiens de la cuisine, du transport et de la conservation des aliments. La poterie a été faite par les femmes des villages depuis l'Antiquité. Il s'agit d'une habilité artisanale consistant à créer des objets faits à la main comme les jarres, les assiettes, les couscoussiers, les vases, les lampes à huile et des articles à usage quotidien qui ont un but pratique et, dans une moindre mesure, une fonction décorative. C'est que, dans ces lieux hostiles, la vie ne permet pas d'être sensible à des choses qui ne servent pas concrètement à surmonter les problèmes urgents auxquels les populations sont quotidiennement confrontées. En effet, «On ne s'intéresse pas aux arts inutiles, car ils ne rapportent rien» (Ibn Khaldoun, 1997, p. 596).

Chambre avec un banquet (*dukkana*).

Vue panoramique du village Zriba el-Alia à partir de la salle de prière du *masjed*.

Les tapis berbères présentent un vocabulaire de signes et de techniques spécifiques qui varient d'une région à l'autre. Nouées avec de la laine de mouton, ces œuvres présentent des décorations aux motifs différents, tantôt géométriques, tantôt humains ou animaux représentés dans leurs principaux signes. Le "*klim*" est l'un des exemples de tapis typiques réalisés pour les maisons de Zriba el-Alia et utilisés comme revêtement du sol ou comme décoration murale. Aujourd'hui, dans certaines maisons du village, l'espace réservé au métier à tisser utilisé par les femmes tisserandes pour nouer des tapis est encore visible.

La vannerie est l'art de tresser l'alfa, une matière végétale souple utilisée pour répondre à divers besoins comme la collecte et le transport des produits agricoles qui sont assurés par des paniers pour le stockage et la conservation des olives et des céréales déposées dans des conteneurs appropriés avec couvercle; les tapis en alfa étaient également utilisés, en particulier dans la *zawiya* et le *masjed*, pour couvrir le pavé de manière à faciliter la prière aux fidèles.

La conservation de ce patrimoine matériel et immatériel nécessite une étude approfondie au niveau socio-anthropologique et typo-morphologique touchant aux échelles paysagère, urbaine, architecturale et technique de l'ensemble historique du village, en vue d'encourager le développement local à travers une forme adaptée d'écotourisme dans le

respect de la culture régionale. La concrétisation de ces objectifs prendra la forme d'un travail de terrain à travers des études archéologiques et architecturales complètes, se basant sur des relevés topographiques et une documentation architecturale des monuments.
La préparation d'un diagnostic exposant les potentialités et les pathologies spatiales et structurelles des bâtiments, ainsi que l'élaboration d'un plan d'action pour leur sauvegarde et leur valorisation seront nécessaires. Il est également important de développer des initiatives visant la connaissance des formes artistiques et des traditions liées à cette dimension historique du village de Zriba el-Alia.
La valorisation globale de l'habitus authentique du village et de son héritage berbère touchera ses deux aspects matériel et immatériel; elle englobera l'élaboration des études pour l'aménagement d'un circuit de visite avec des séquences thématiques, la conception de panneaux signalétiques et de divers supports virtuels, la promotion de l'artisanat local et des produits de terroir, en impliquant les différents acteurs concernés (habitants, autorités locales, randonneurs, chercheurs, etc.).
Il est également indispensable d'organiser des rencontres entre théoriciens et professionnels de la socio-anthropologie en vue de cerner la théâtralité de l'acte créatif et son rapport avec le

lieu de la représentation pensé comme espace habité par une multitude de traces culturelles. Cela consistera en une collecte de productions artisanales qui participent à l'histoire du village et à son cachet culturel authentique.

Par ailleurs, ces travaux seront axés sur les résultats des études et des réflexions déjà réalisées sur les villages montagnards et, par conséquent, leur intégration dans le contexte physique et écologique, tout en soulignant les traits distinctifs et les ressemblances du village de Zriba el-Alia avec les autres villages perchés de la région du nord-est (Jeradou, Sidi Medien et Takrouna), du centre (Kesra à Siliana) ou du sud du pays (Toujane à Matmata, Chenini à Tataouine, etc.).

Les caractéristiques structurelles d'origine sont aujourd'hui encore reconnaissables dans les villages les plus isolés où l'aspect général des zones habitées est demeuré presque inchangé dans sa forme primitive, déterminée par la pauvreté et l'isolement dans lesquels naquirent les villages. Le paysage rural des communautés abandonnées est, toutefois, encore aujourd'hui un témoin exceptionnel. Il raconte les interactions homme-environnement et la façon dont les structures du territoire étaient vécues par les habitants, nous indiquant ainsi sa plus vraie et profonde identité. C'est dans ce sens que les constructions des villages berbères abandonnés constituent un patrimoine exceptionnel, un témoignage significatif du paysage et de l'économie rurale tunisiens qui représentent dans leur ensemble une magnifique démonstration de la manière dont l'homme sut exploiter et s'adapter à ce que l'environnement offrait et requérait.

En définitive, l'étude des villages berbères tunisiens nous offre, dans son extraordinaire simplicité, une surprenante synthèse de civilisation et de savoirs humains, un équilibre singulier entre l'espace matériel et le paysage environnant nous offrant ainsi une idée de l'histoire et de la tradition qui comporte la connaissance du passé.

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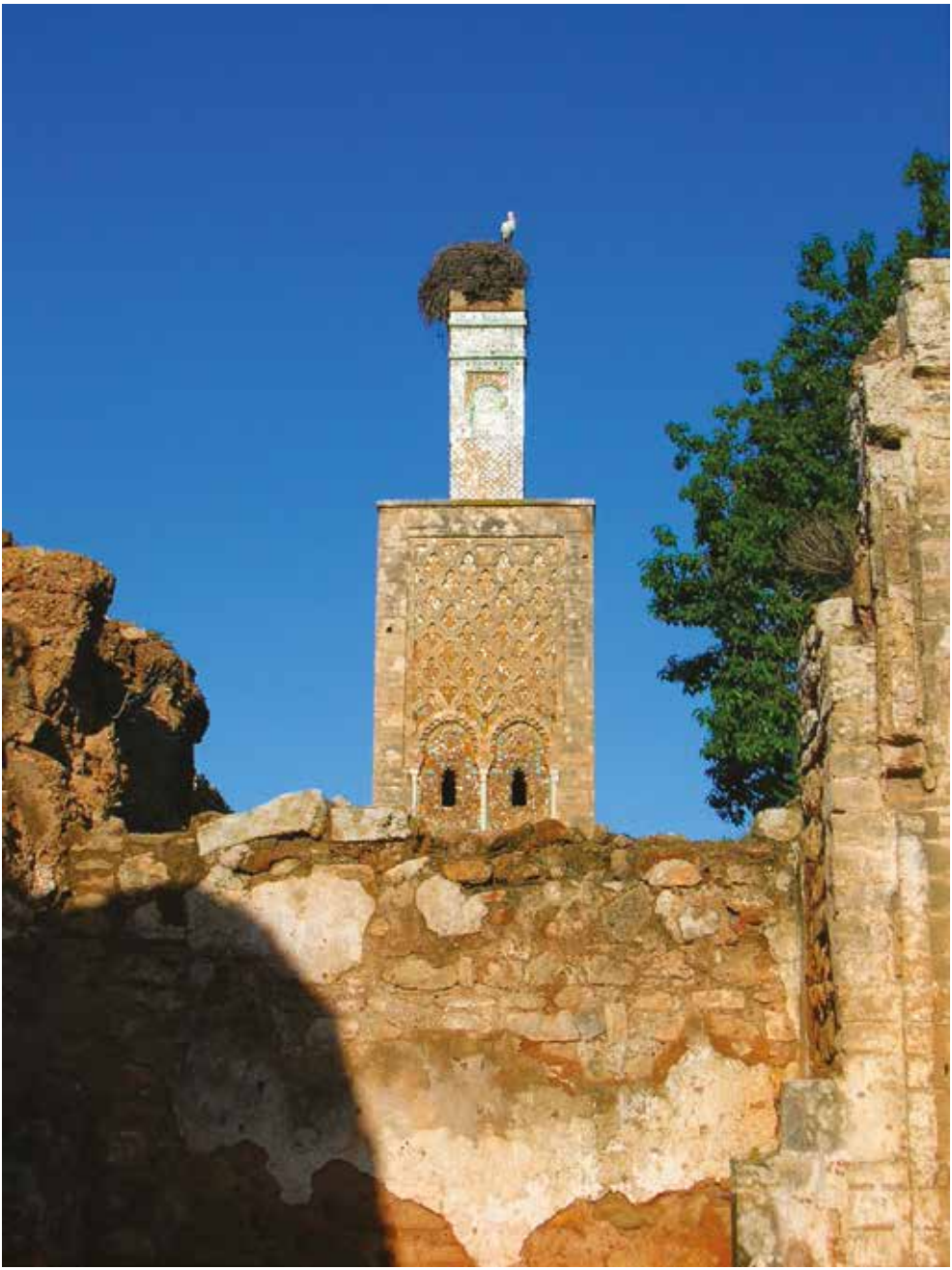

CHELLAH, SPLENDEUR ET DÉCLIN D'UNE VILLE MÉRINIDE

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Minaret de la madrasa-zawiya.

The archaeological park of Chellah is located on a low hill covered with vegetation overlooking the valley of the Abu Regreg river in the oldest part of the present-day city of Rabat. The site, protected by imposing walls, includes the remains of the ancient Roman city of Sala and the monuments of the Merinid necropolis (14th century), consisting of a mosque, a madrasa, a mausoleum and rooms for ablutions. It is still difficult today to establish an exact chronology of the different phases of the site's evolution. However, no urban planning project followed the construction of the monumental complex of the Merinid necropolis. Although damaged by the earthquake of 1755, the architectural complex still shows traces of different phases of occupation, ancient and medieval, with stratifications that are difficult to detect in detail.

Mots clefs: Architecture islamique, Chellah, Maroc, Dynastie mérinide, médina de Rabat.

Chellah se situe dans la partie la plus ancienne de l'actuelle ville de Rabat, la capitale du Maroc. Le site, qui occupe 7000 m^2, est de grande importance stratégique puisqu'il est situé seulement à 200 mètres de la ceinture de murailles almohade de la médina de Rabat, en face de la porte "Bab Zaër". Le terme "Chella" était déjà utilisé à partir de l'époque de la conquête arabe. Il pourrait dériver du nom phénicien "sala" qui veut dire roche ou rochet, ou d'une des langues chamito-sémitiques (araméenne ou berbère) du terme "celle" qui évoque le sens de grande quantité ou grande intensité (Ismael 1975, p. 7).

Le parc archéologique se situe sur une basse colline couverte de végétation qui domine la vallée du fleuve Abu Regreg, abri extraordinaire pour les cigognes qui y font leur nid pendant la saison de reproduction. Le site, protégé d'imposantes murailles, comprend les vestiges de l'ancienne ville romaine de Sala et les monuments de la nécropole mérinide (XIV siècle), composée d'une mosquée, une madrasa, un mausolée et des salles pour les ablutions.

Toutefois, aucun projet d'urbanisme n'a suivi l'édification du complexe de monuments de la nécropole mérinide. Il est encore aujourd'hui difficile d'établir une chronologie exacte des différentes phases d'évolution du site. Bien qu'endommagé par le séisme de 1755, le complexe architectural présente encore les traces de différentes phases de l'occupation, antiques et médiévales, avec des stratifications difficiles à déceler dans le détail[1].

[1] Le site du Chellah, propriété de l'Etat, est protégé par le décret royal du 19 novembre 1920 qui définit comme

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Vue générale du parc archéologique de Chellah.

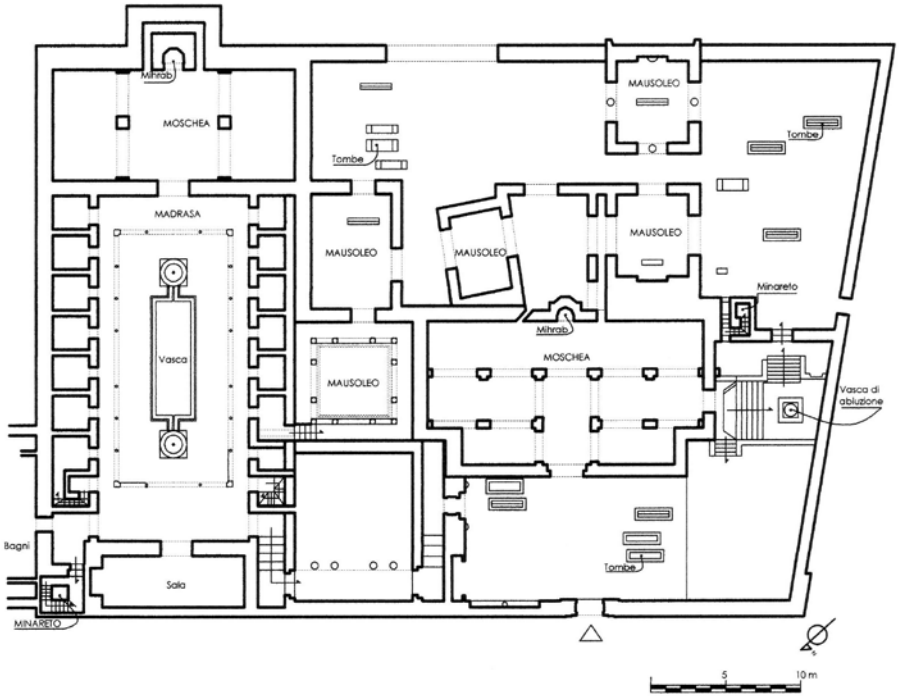
Planimétrie générale de la nécropole.

Les remparts, très longs, sont caractérisés par une unique porte d'entrée, enfermée entre deux tours fortifiées, qui s'ouvre avec un arc lancéolé. Un petit chemin conduit, après une centaine de mètres environ en direction du fleuve Bou Regreg, à l'ancienne ville romaine et à la nécropole royale mérinide. Une porte particulièrement imposante permet l'accès au complexe, où un escalier sinueux descend vers l'aval, où se trouvent des petites tombes de marabout. La nécropole royale se trouve auprès plusieurs sources dont une considérée comme sacrée *Ayn Mdafa*, peuplée par des anguilles, auxquelles la croyance populaire attribue des pouvoirs thaumaturgiques.

Il n'existe aucune source historique antérieures au Ier siècles après J.-C qui mentionne explicitement l'origine de Sala. Cependant, grâce aux fouilles archéologiques, on peut dire que le site conserve les restes du plus ancien établissement humain à l'embouchure de la rivière Bou Regreg, où les Phéniciens et les Carthaginois ont probablement vécu (Boube 1984, pp. 155-170).

Les principales informations écrites sur Sala remontent à l'époque romaine. La lecture attentive de la description rédigée par l'historien du Ier siècle après J.-C., Pomponius

monument historique tout le complexe – BO n° 423 du 23 novembre 1920 – p. 2016.



Méla permet de constater que les vestiges de Sala, la plus méridionale des villes romaines de la côte atlantique, pouvaient s'identifier avec le site mérinide de Chellah, située sur la rive gauche du fleuve, «[…] De ses habitants, les uns vivent dans les forêts, moins nomades cependant que ceux dont nous avons parlé tout à l'heure. Les autres habitent des villes. Les plus importantes, autant que peuvent l'être de petites villes, sont loin de la mer: Gilda, Volubilis, Prisciana; sur la mer Sala et Lixos, arrosée par le Lixus» (Pomponius Méla, III, 10, 107). Le site conserve les vestiges d'une importante agglomération romaine qui a comme toponyme Sala mentionnée par le naturaliste, Pline l'ancien (V, 5, 4) et le géographe égyptien du IIème siècle après J.-C. Ptolémée (I, 2); par contre *Itinerarium* d'Antonin se limite uniquement à la citation géographique de Sala Colonia, sur le parcours entre *Ad Mercurios* et Tingi en précisant qu'elle est à 16 milles de *Ad Mercurios*.

Durant les années trente puis soixante, des importantes campagnes de fouilles archéologiques ont été menées au cours de laquelle les archéologues ont découvert la structure urbaine de la ville et une partie des monuments des époques mauritaniennes et romains de la ville (Boube 1959-60, pp. 141-145). Et en nettoyant le site de la végétation ont déterré le

Vue de la nécropole mérinide.

Portail principal du parc archéologique.

forum, un arc de triomphe, une fontaine monumentale, un complexe thermale, des tombes, une basilique chrétienne et les restes de la rue principale *Decumanus Maximus*. Il semble que ce dernier se prolonge dans la direction de l'ancien port sur la rive du fleuve, ce qui témoigne que la ville romaine dépasse les murs de la nécropole mérinide. A cette découverte se sont ajoutées les témoignages épigraphies, de statues et d'objets en céramique, qui ont contribué à éclaircir l'histoire de la ville (Chatelain 1944, pp. 81-86). Il n'a pas été facile, pour les archéologues, de distinguer les vestiges correspondants aux différentes époques du fait de la continuité des phases de développement de la ville, qui a créé une époustouflante stratification architectonique, depuis l'époque phénicienne jusqu'à celle des Mérinide.

Au Moyen Âge, avec l'arrivée en 789 dans l'ancienne ville romaine de Volubilis des Idrissides dirigés par le premier calife Idriss I (788-792), Chellah est passée sous leur contrôle (Ismael 1975, p. 186). Après la mort de Idriss II (804-828), fondateur de la capitale Fès, les différents domaines furent divisés entre les neufs membres de la famille. Grâce à Ibn Khaldoun, on apprend que *moulay* Aïssa ben Idriss II avait obtenu en héritage les possessions de Salé, Chellah, Azemmur ce qui montre que l'ancien centre urbain romain

n'était plus le seul de cette zone mais qu'il en existait un autre situé entièrement sur la mer c'est-à-dire sur la rive droite du fleuve Bou Regreg (Ibn Khaldoun, III, p. 222). C'est à cela que l'on doit la confusion entre les deux sites, due au fait que les historiens de l'époque mentionnaient sans distinction le nom de Salé ou de Chellah. En effet, la nouvelle ville de Sala joua pendant le XIème siècle un rôle essentiel: elle devint la capitale d'un petit état ifranide (1033-1038), avec à sa tête Tamim, dont les territoires s'étendaient au sud jusqu'à Fès, et occupaient la majeure partie du nord du Maroc (Ibn Khaldoun, III, pp. 215-224).

Ceci pourrait signifier l'abandon de la première installation de la ville ancienne en faveur du développement de la nouvelle capitale. A ce propos, on dispose de certaines informations qui proviennent des plus anciens géographes arabes de l'époque, Ibn Hawqal (Ibn Hawqal 2001, p. 78) d'abord et al-Bakri (El-Bekri 1913, p. 259) ensuite, lesquels semblent affirmer que le site, après la splendeur connue sous la domination romaine, n'ait plus été habité.

Jusqu'à l'arrivée des Mérinides le site de Chellah était formé d'une simple mosquée qui était placée à l'est des vestiges romains. L'édifice probablement isolé et perdu dans la campagne était fermé à l'extérieur de manière à ce que ses murs puissent la protéger en cas d'attaque.

Vestiges de l'époque romaine.

Cour de la madrasa-zawiya avec la façade de la salle de prière.

Le monument se présente sous la forme d'un sanctuaire de petites dimensions. Le prince mérinide Abu al-Hasan (1331-1351) transforma le complexe de Chellah en une vaste nécropole pour sa dynastie. Le projet fut celui de réserver une ample aire autour de la vieille mosquée en l'entourant au moyen d'une grande enceinte murale. A cette période, Chellah prend toujours plus les connotations d'une ville dédiée aux morts, c'est en ce lieu qu'ont été enterrés différents princes et personnages célèbres appartenant à la dynastie. En effet, ce site est constitué de nombreux mausolées, d'une mosquée avec une salle pour les ablutions et d'une médersa-zawiya.

C'est en 1338 que Abu Hasan fit construire d'imposants remparts pour protéger la nécropole. L'énorme muraille défensive était composée de cinq longs murs de différentes dimensions, le plus long placé au nord-ouest mesure 300 mètres alors que le plus court se trouve sur le côté sud-est et ne mesure que 80 mètres. Les murs, entièrement construits en pisé, ont une hauteur de 7 mètres et une épaisseur d'environ 1,60 mètres. La totalité des remparts est constituée de 22 tours carrées distantes d'environ 32.50 mètres chacune. On ne doit pas considérer de tels remparts comme une œuvre militaire mais comme une œuvre civile, érigée pour protéger les monuments funéraires situés à l'intérieur de celle-ci.

Les murs avaient trois portes (Bab al-Gharbi al-Kabir, Bab ʿAïn al-Janna, Bab al-Basatin). La porte située au sud-ouest, appelée Bab al-Gharbi al-Kabir, est l'entrée principale du site. C'est un véritable chef d'œuvre de l'art arabe du fait de sa grandeur et de son riche décor constitué d'un arc lancéolé et placée entre deux tours octogonales qui pointent à leur sommet en deux *muqarnas* jusqu'à former un carré qui présente quatre créneaux aux angles. A l'intérieur, la porte conserve les anciens postes de garde et les vestiges d'une foresterie: un petit escalier conduit aux terrasses situées sur les tours. Une inscription placée dans la partie supérieure de la porte donne la date de début des travaux de construction de l'édifice qui coïncide avec la période dans laquelle régnait Abu Said Uthman II (1310-1331). L'œuvre fut terminée par son successeur Abu al-Hasan en 1339. La porte nord-ouest appelée Bab ʿAïn al-Janna et la porte sud-est appelée Bâb al-Basatin, sont de simples entrées qui ne présentent aucun décor architectural particulier.

Le choix architectural suivi dans la construction des Mausolées et les tombes par les rois de la dynastie mérinide a été celui de couvrir les espaces à l'aide de coupoles décorées de tableaux de céramique, de stucs et de pierre sculptée. Parmi ces coupoles, la plus représentative des structures architecturales et décoratives, méritant une description détaillée, est la tombe du

Cour intérieure et vue de la façade nord de la mosquée.

Minaret de la mosquée

Mausolée du sultan Abu Hasan Ali I e détail des décorations en pierre sculptée, stuc et céramique.

sultan Abu al-Hassan connu comme "Le Sultan Noir", qui a vécu au XIVème siècle. Cet édifice a une base carrée, il est particulièrement décoré avec des panneaux de marqueterie céramique blanche dans la partie inférieure, alors que dans la partie supérieure les murs sont couverts de stucs. L'extérieur est orné avec des bas-reliefs en pierre taillée.

La mosquée de Abu Yusuf Yaqub (1258 environ), avec son minaret en ruine, est composée d'une cour rectangulaire et une unique porte permettant d'accéder au complexe architectural royal. Cette cour précède à son tour une salle de prière formée par trois nefs transversales. Au centre du mur de la *qibla*[2], on trouve une niche semi-circulaire (*mihrab*) couverte par une demi-coupole sphérique. Le plafond n'a plus de couverture. Il devait sans doute à l'origine être constitué d'une structure de poutres croisées soutenant deux couvertures.

Dans l'angle est-ouest se dresse le minaret, de forme carrée et en ruine, alors que vers le côté est de la salle de prière se trouve le bassin pour les ablutions qui sert aux fidèles à se purifier selon un rituel qui précède la prière.

[2] Le mur qui indique l'orientation vers la ville sainte de la Mecque.

En ce qui concerne la médersa-zawiya, on n'a que très peu d'informations sur le but dans lequel est utilisé une importante structure sacrée placée à l'angle nord du complexe. Les vestiges, très abîmés sont composés d'une cour au centre de laquelle se trouve une vasque entourée par un péristyle avec de colonnettes et des chapiteaux de marbre, en face se trouvent une série de pièces placées respectivement sur les côtés est et ouest. Au sud se trouve une petite salle de prière rectangulaire composée de deux nefs parallèles au mur de la *qibla* avec au centre un *mihrab* pentagonal orné avec des stucs aux motifs végétaux.

Sur le côté opposé, dans la zone nord, un minaret élancé a gardé les caractéristiques architecturales de l'époque. De type carré, il est composé de deux niveaux: le premier étage constitué par une base faite de blocs de pierre ornés dans leur partie supérieure par des motifs géométriques constitués de losanges de pierre croisés; le second, plus petit, recouvert sur les quatre faces de carrelage en céramique de différentes couleurs.

La technique constructive utilisée dans l'ensemble du complexe de Chellah est le pisé. La terre crue se place, avec le bois et la pierre, entre les matériaux de construction les plus antiques. Pline l'Ancien fait référence, au Ier siècle après J.-C., à ce matériau largement utilisé aussi en l'époque romaine, usage confirmée par des données archéologiques et des sources littéraires, dans sa *Naturalis Historia* (XXXV, 169) lorsqu'il décrit des murs faits de terre, dont certains datant de l'époque d'Hannibal «…*terra parietes, quos appellant formaceos, quoniam*

Détail du mur d'enceinte en pisé

Vue générale du site avec la rivière Bou Regreg en arrière-plan.

*in forma circumdatis II utrimque tabulis interficiuntur verius quam struuntu*r / en terre, que l'on appelle *formacei* car ils sont construits, ou plutôt remplis, en comprimant la terre dans un moule formé par des planches de bois».

Les différentes techniques de construction sont fonction des caractéristiques morphologiques du sol, mais également fonction du cadre culturel et environnemental dans lequel elles se sont consolidées. Elles témoignent d'études sur le choix du matériau, sur la conception du bâtiment, sur les modalités de conduite du chantier. Partout dans le monde il existe des exemples de constructions en terre qui présentent beaucoup d'intérêt, allant des mosquées du Mali, des édifices du Yémen, des agrégats urbains du Maghreb (Tunisie, Algérie, Maroc) jusqu'aux prestigieux bâtiments en Europe ou même les habitations les plus simples, en milieu rural, que l'on trouve un peu partout. Au Maroc, par exemple, la technique du pisé connaît une incroyable continuité jusqu'à notre époque, elle est utilisée encore aujourd'hui pour construire d'imposants bâtiments à plusieurs étages, ce qui demande une considérable force humaine. Tout d'abord on choisit le matériau en se basant sur sa cohésion et sa couleur. Toutefois, pour construire en pisé on cherche généralement à utiliser la terre provenant du site même. Pour cela on creuse d'abord la surface établie pour l'édification et ensuite on mouille le sol en effectuant des petits fossés aux endroits où, par la suite, on prélèvera la terre. Le procédé d'humidification du terrain a lieu environ quinze jours avant l'extraction, faite avec un procédé selon lequel seul le maître maçon vérifie la proportion d'eau.

Le travail est effectué par équipes de trois ou quatre personnes: l'artisan, la maître maçon et deux assistants. La structure en bois qui sert de moule est formée de deux panneaux en bois constitués de trois ou quatre planches mises horizontalement et assemblées par d'autres éléments en bois cloués transversalement. Les panneaux ainsi formés sont posés de part et d'autre du mur et reliés à l'aide de piquets en bois reliés sur la partie inférieure par des traverses horizontales et sur la partie supérieure par des cordes qui sont tendues plus ou moins afin d'obtenir une certaine régularité de l'épaisseur. La construction d'un mur consiste à poser des caissons en bois (ou coffrage) dans lesquels est comprimée l'argile humide, pas trop fine, mais plutôt grossière, qui est ensuite ultérieurement comprimée par un ouvrier à l'aide d'un maillet en bois très lourd.

Une fois les moules enlevés il reste un bloc qui, au fur et à mesure qu'il sèche se durcit ainsi la construction du mur en hauteur se fait avec des blocs superposés, mais les joints sont décalés d'un bloc à l'autre. Le maître maçon contrôle la régularité de l'épaisseur du mur et la résistance des moules et aussi la verticalité du mur est assurée par l'utilisation d'un simple fil à plomb.

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WITH THE KEY ON THE HEART, BETWEEN THE PAIN OF LOSS AND FUTURE HOPE

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The present condition of the village of Lifta west of Jerusalem.

At the heart of the conflict between Israel and Palestine is the territorial expansion policy, which caused since 1948 an unceasing campaign of destruction of the traditional landscape and villages. The occupation of the Palestinian territory gave the Israeli the opportunity to demolish houses and damage fields and trees, to build only-Jewish outposts and settlements connected by an exclusive network of roads and infrastructures, to isolate Palestinian towns and villages through ditches and barriers. Palestinians have lost their lands and their identity. They are now using building techniques unrelated to their tradition, neglecting the ashlar construction that characterizes traditional architecture. The role of architects and engineers risks to assume a vital role and to contribute irreversibly to the destruction of the environmental and historical heritage. Despite the current situation and failing effective legislation, since some years actions of protection and enhancement of Palestinian villages have been carried out by non-governmental institutions with interesting results. Some of these actions will be presented in the paper. They were carried out in full respect of traditional construction features, rediscovering forgotten skills and involving local populations, especially women and children. A first tiring "reconquest", which opens new horizons for a civil life and peaceful coexistence.

Keywords: Palestinian villages, traditional technologies, cultural appropriation, cultural heritage rights, heritage community

The situation is dramatic although little is known, however thanks to a strategic "rewrite" and elimination of the documents on which the studies that denounced actions of "ethnic cleansing"[1] were based. At the centre of the long conflict between Israel and Palestine, since

[a] Palestinian women often keep the key of their old house for decades, waiting to return. If the house no longer exists, the key still represents a strong symbol of belonging.

[1] H. Shezaf, "Burying the Nakba: How Israel Systematically Hides Evidence of 1948 Expulsion of Arabs", in *Haarez*, (5.7.2019).

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Map of Israeli territorial expansion into Palestinian-inhabited territories (Palestine Awareness Coalition).

The Separation Wall in Bethany.

the early 1920s (British Mandate), there is the constant policy of territorial expansion to the detriment of the Palestinian territory[2].

The systematic demolition of villages, some of which are very old, and the forced expulsion of about 800,000 Palestinians, is at the basis of the Israeli colonization, which reaches our days with the Separation Wall and the constant occupation of land. While during the British Mandate some first actions of protection were performed (pro-Jerusalem Society, at the urging of Governor Sir R. Storrs, and the foundation of a Department of Antiquities under the influence of the British School of Archaeology) with the birth of Israel in 1948 systematic demolitions spread to Jaffa, the main Arab centre of the region. In 1949, Israeli archaeologist Shmuel Yeivin proposed a commission with the task of preserving the typical oriental form, symbol of Jaffa's past, when there was little left to protect. Reconstructions were incompatible with the basic principles of restoration, which were already established in Europe at the time, and used non-traditional architectural materials and techniques[3].

[2] Compare maps of 70 years ago with current ones.
[3] Only in 1990 will the independent governmental authority (Reshut ha'Hatikot) be active in the protection of cultural heritage.

During the 1948 *Nakba*[4], approximately 500 Palestinian villages were destroyed, several homes demolished and others occupied by Israeli families. Since those years, more than 900 "Jewish-only locations" have been authorized in Israel, but none for the Palestinians, apart from few villages in the Negev, which were displaced Bedouin communities that were resettled[5].

The phrase "*a land without people for a people without land*", used at the time of the creation of the state of Israel, however, has different intentions and tools to achieve it. In 1998 Ariel Sharon said: "*Everybody has to move, run and grab as many hilltops as they can to enlarge the settlements because everything we take now will stay ours… Everything we don't grab will go to them*"[6]. Israeli occupations are based on ideological declarations and opportunistic justifications: "*Palestine is grossly under populated. It contains vast colonization potential which the Arabs neither need nor are qualified (because of their lack of need) to exploit*", Ben Gurion wrote in a letter to his son in 1937[7].

[4] "Catastrophe" in Arabic.
[5] 350 of 370 villages founded by Israel between 1948 and 1953 were built on land confiscated from Palestinians. To legitimize the seizures the lands and houses Israel used military regulations and specially made laws such as the so-called "absentee property law" (1950). It establishes the confiscation of all properties "abandoned" by those who had fled (forced to flee). Y. Lein, E. Weizman, "Land Grab. Israel's Settlement Policy in the West Bank", in *B'Tselem*, May 2002.
[6] As foreign minister, in comments broadcast on Israeli radio in November 1998.
[7] https://jewishvoiceforpeace.org/the-ben-gurion-letter/, accessed August 21st, 2020.

The area of the demolished house is reoccupied by a tent.

During the mud brick production in Jericho.

The occupation of the villages involves the demolition of everything that could represent a memory for the Palestinians forced to leave with the idea of cutting, in this way, any reference to different cultures and traditions and reduce the risks of future claims. The Israeli aim was (and today is not different[8]) to conquer the territory, legitimizing its presence also from the historical point of view. After 1967 Six-Day War, the historic Palestinian West Bank was occupied and set the basis to plan residential areas inspired by the "myth of the frontier" (Allon Plan[9], Sharon-Wachman Plan[10]).

"Illegal but legitimate" (Chomsky)[11]

The techniques used by the Israelis to carry out confiscation of territory, in summary, consist of:

- Direct demolition of houses[12]. Asymmetrical and binding spatial planning has confined many Palestinian residents to villages with unsustainable and dangerous

[8] The extension of Israeli sovereignty is foreseen by the Trump peace plan unveiled on January 2020.
[9] The Plan, proposed by Minister of Labour Yigal Allon, shortly after the Six-Day War in 1967, aimed to annex to Israel a long strip of territory along the Jordan Valley, from the Golan Heights down to the Sinai Peninsula, to establish a belt of agricultural settlements.
[10] The Sharon-Wachman Plan was announced in 1977 while Ariel Sharon was head of the Ministerial Committee on Settlements. It called for the establishment of Israeli settlements organized in sustainable blocks across the West Bank connected by a network of highways. Avraham Wachman was professor of architecture at the Technion in Haifa.
[11] N. Chomsky, *Illegale, eppure legittimo. Una dubbia dottrina del nostro tempo*, Roma 2000, (orig. *Illegal, doch legitim. Eine dubiose Doktrin unsere Zeit*, 2005.
[12] After the Kaminitz law (1965) which increased the penalties for building offenses, as of July 2015 97% of the 1348 demolition orders concern Palestinian structures.

population density that have no possibility of expanding, contrary to what happens for Israeli settlements and cities.

- Isolation of villages by building moats and earth walls to turn them into inaccessible open-air prisons and destruction of trees and crops. Many Jewish colonies are built on confiscated farmland and pasture.
- Construction of the so-called "Security Barrier", known as "The Wall" following the second Intifada. The Wall incorporates strategically the resources of the territory (fertile soils, water installations, archaeological sites). The Wall extends for over 700 km instead of following the 323 km of the Green Line, the armistice line of 1948.
- Palestinians in the West Bank live with a constant shortage of water exacerbated by stringent Israeli restrictions. Under the Interim Agreement (Oslo II) signed in 1995, Israel retained control of all water resources. The agreement stipulated that 80% of water in the West Bank pumped from the mountain aquifer would be allotted to Israeli use and the remaining 20% for Palestinian use[13].

[13] B'Tselem, 11/11/2017, https://www.btselem.org/water, accessed August 21st, 2020.

The mud-brick complex of Mosaic Centre in Jericho.

- "Archaeological" interest represents a strong and recurring justification for the expulsion of the inhabitants. An example is Silwan, a suburb of Jerusalem that since decades has become a permanent archaeological site (excavated with inappropriate methods that have been criticized also by Israeli archaeologists[14]).
- Establishment of a system of roads and infrastructures that connect only the new Israeli settlements and exclude the Palestinian villages that become unreachable.

Before conservation works in Sebastia.

In addition, another procedure must be added that can indirectly but definitely cause a strong loss of identity, realizing the prediction of Canaan (1932): "*…a few years more and the characteristic oriental ways of construction will have been more or less abandoned and the technical Arabic terms forgotten*"[15]. Buildings in large square-cut and finely dressed stone, representing the Palestinian building tradition[16], are replaced by new reinforced concrete structures and prefabricated blocks covered with stone cladding. In degraded villages, Palestinians tend to rebuild with non-traditional techniques and materials[17]

[14] Emek Shaveh, 6/2/2017, https://alt-arch.org/en/rise-in-infrastructural-work-and-excavation-activity-at-the-city-of-david-archaeological-site-in-silwan/, accessed August 21st, 2020.
[15] T. Canaan "The Palestinian Arab House", in *Journal of the Palestine Oriental Society*, 12/1932, 13/1933.
[16] L. Marino, M. Londino, *La casa tradizionale nei villaggi della Giordania*, Verona 1999, S. Amiry, V. Tamari, *The Palestinian Village Home*, London 1989.
[17] G. Dalmann (*Arbeit und Sitte in Palastina, VII Das Haus*, Gutersloh 1942) classified Palestinian homes on the basis of roofing systems, T. Canaan (1932, 1933) referred to masonry techniques.

because construction workers are trained mainly in Israeli construction sites using the available materials. The wrong selection of building material or technology might be very dangerous because in a short amount of time the new generations will lose the traditional building knowledge and will inevitably be forced to adopt building models and constructive solutions that are foreign to their culture. One of the most evident harmful results is the spread of folkloristic tourist villages that offers only apparent authenticity to careless and poorly interested tourists. Conservators in particular take on great responsibilities not only technical but, once again, cultural and ethical. Some restoration activities are marked by the systematic demolition of what exists to construct new buildings, squares and streets that have nothing to do with the ancient architecture that disappeared. Significant, among others, are the fort Qal'at al Buraq in Bethlehem and the new city Rawabi in Ramallah.

Placed in a comforting "neutrality", the role of architects[18] and engineers risks to be a key factor contributing irreversibly to the protection or destruction of the environmental and historical heritage. In addition, even archaeologists and historians can be ambiguous actors in the context of "cultural policies" of little use for local populations because they might "*make one story become the only story*"[19]. It is urgent to promote a new form of "collective memory" that

18 In many cases, architects, archaeologists and historians can represent a potentially dangerous category because they carry out activities that seem neutral but which, in fact, are only apparently compatible with local cultures. L. Marino, *SC70/90, AK 74M, M16.* "Ma gli architetti non sparano", in *Restauro Archeologico* 1-2, 2013, pp. 66-71.

19 C. Ngozi Adichie, *Il pericolo di un'unica storia*, Torino 2020 (orig. *Danger of a Single Story*, 2009).

After conservation works in Sebastia.

can facilitate mutual understanding and stimulate intercultural dialogue (and practice). In a region of historical cultural diversity, everything possible must be done to emphasize the richness and value of the current stratification. We need to increase our efforts to transform a rigid barrier of distance into a permeable frontier in the meaning pointed out by R. Debray: "*Recognised borders are the best conceivable vaccine against the epidemic of walls*" [20]. Certainly, in order to avoid other disasters, it is necessary to trace new strategies, at a political, economic and cultural level, different from those pursued up to now.

The Palestinian reconquest

Despite the absence of an effective overall project, since some years actions of protection and enhancement in Palestine have multiplied with interesting results. For many years the non-governmental associations pro Terra Sancta and Mosaic Centre have been working together in the Palestinian Territories to safeguard cultural heritage, involving local communities. Their first joint project took place in the Umayyad palace of Qasr Hisham in Jericho between 1999 and 2003, which addressed the problem of the lack of qualified technicians in the field of cultural heritage conservation in the nascent state of Palestine. In addition to mosaic conservation, the project included the training of a first

[20] R. Debray, *Éloge des frontières*, Paris, 2010.

group of Palestinian youth[21]. Their basic strategy, which will remain constant in all future actions, is using local resources to help resident communities grow culturally and socially, as well as economically, and strengthen their identity. It has been a concept that in recent years has proved crucial for the conservation of cultural heritage[22].

The Mosaic Centre finds life in a mud-brick complex

Founded in 2002, the Mosaic Centre has over time become a pioneering organization in the preservation and promotion of Palestinian cultural heritage. Through its projects, carried out in collaboration with public institutions, other local and international organizations and especially with pro Terra Sancta, the Mosaic Centre has gradually grown and today a group of twenty-five youth is involved permanently in the association[23]. The centre manages conservation projects in the Palestinian Territories and neighbouring regions, organizes awareness-raising activities for the local population, promotes social inclusion and supports income-generating activities.

Since 2014, it dedicated special attention to the environment of Jericho and to the traditional buildings in adobe, which have almost completely disappeared due to neglect and lack of maintenance. Its goal was to recover a complex of buildings made of mud bricks, abandoned in poor condition, to leave future generation a testimony. It was necessary to improve the production techniques of mud bricks, speeding up construction times. A special machine was designed to make mud bricks higher than traditional bricks. The machine works under pressure and the mixture of the raw material, clayey earth, unlike the traditional method, is slightly wet and mixed with gravel, to reinforce the mixture. The working team preserved also the internal and external plaster and insulated the roof with *huwar* mortar (mixture with straw)[24]. The complex is now the Jericho headquarters of the Mosaic Centre, which takes care of routine maintenance and welcomes visitors here, including schools and universities.

Sebastia and the resources of the territory

In the same years, the two associations committed themselves to preserve the historic centre of the small town of Sebastia, northwest of Nablus[25]. The management of Sebastia's cultural

[21] O. Hamdan, C. Benelli, "A Practical Experience in Training in Conservation in Palestine", in *Tutela, Conservazione e Valorizzazione del Patrimonio Culturale della Palestina*, vol. V, ed. F. Maniscalco, Napoli, 2005, pp. 149-59.
[22] The preamble of the Faro Convention (2005) of the Council of Europe emphasized "the value and potential of cultural heritage wisely used as a resource for sustainable development and quality of life in a constantly evolving society".
[23] O. Hamdan, "The Revival of Palestinian Mosaic Art – Through People and Tesserae," *Palestinian Mosaic Art – Compairing Experiences*,2017, 54-67.
[24] T. Canaan, 13,1933.
[25] Samaria/Sebastia has been an archaeological site since the time of the British Mandate and the Jordanian

Village woman expert in earth plaster during the training conservation activity for the young people.

Palestinian mosaicists during activity in Bethany.

heritage, like the whole of the West Bank, follows a complex combination of authorities. The Palestinian Authority controls the village and the unexcavated part of the archaeological site, located in Area B[26]. Israel has control of the remains in Area C, which includes the hilltop acropolis. The division between Areas B and C passes almost in the centre of the Roman forum, dividing it between Palestinian jurisdiction and Israeli control. The local community is completely excluded from the management of the archaeological park.

At the beginning of the activity, the two associations realized that tourism was not giving any benefit to the local population, apart from the few shops in the area of the Roman forum, because the tourist visit was limited to the ancient city on the acropolis.

The interventions in the old core of the village made it possible to reconstruct the vital axis with the archaeological site, excavating and enhancing places of historical-architectural value. The preserved buildings have been equipped for tourism accommodation,

administration. When Israel occupied the West Bank in 1967 it was placed in the list of its National Parks. On the top of the hill, excavated for the first time by Harvard University (1908-1910), the impressive remains of ancient Samaria/Sebaste (Iron Age and Hellenistic, Roman, Byzantine and early Islamic remains) have been brought to light. In the village there are also important remains, gathered around the mosque dedicated to the tomb of John the Baptist, once a Byzantine and Crusader cathedral.

[26] Following the Israeli-Palestinian Peace process, the Taba agreement of 1995 established that the authority over the West Bank would have been transferred gradually from Israel to the Palestinian Authority and divided the territory in areas A, B and C with the exception of Jerusalem. It concerned also archaeology and redacted a list of 12 sites of special interest for Israel, which should have been overviewed by a Joint Israeli-Palestinian Committee also after the transfer of responsibility. But the agreement has been frozen before the handing over of the area C, and more than 20 years after almost 60% of the territory of the West Bank is still under total Israeli control, including Sebastia and other archaeological sites.

allowing the local community to welcome tourists and get economic, as well as social and cultural benefits[27].

With the growth of tourist visits, the project expanded the area of intervention involving the nearby village of Nisf Jubeil. An abandoned house dating back to the 1700s was preserved and furnished with a kitchen to offer traditional meals prepared by the local community. Conservation activity was carried out using local materials and traditional techniques, respecting the surviving architectural elements. For the preparation of the plaster, traditionally responsibility of women, the working team was guided by an elderly woman of the village both in the choice of materials and in the implementation. A pottery workshop was also installed, creating an additional attraction that brings economic benefit.

Bethany, the hospitable city: from Martha and Mary to the current women's associations

The village of Bethany (al-Azariya in Arabic) is located a few kilometres from Jerusalem, on the eastern slopes of the Mount of Olives, along the ancient path that led to Jericho. It is the site where, according to Christian tradition, Jesus was guest of his friends Lazarus, Martha and Mary, and where he raised Lazarus from the dead. Over the centuries, Bethany has become an important pilgrimage centre and until today hosts a large number of religious tourists. The local community lives in a context of extreme political instability caused by the conflict between Israel and Palestine and in dramatically deteriorated economic conditions after the construction of the Wall on the Mount of Olives in 2002, which divides Bethany from Jerusalem. Conservation activities in the village are aimed at the protection of the

[27] C. Benelli, O. Hamdan, M. Piccirillo, *Sabastiya, History, conservation and local community*, Jerusalem, 2007.

remains that were in a state of decay and abandonment. A project funded by the Italian Agency for Development Cooperation (AICS) is currently carried out by pro Terra Sancta and Mosaic Centre. Its activities focus on the development of alternative tourism strategies by expanding and improving the offer and bringing important benefits to the local population, especially to the most vulnerable.

The project supports participatory sustainable tourism activities, creates new job opportunities and encourages pride and belonging among community members. Young people are involved and supported to share the responsibility of conservation and enhancement with visitors, witnesses of other cultures.

Conservation works are an opportunity to train local young people as conservation technicians. Many areas and buildings have been recovered and made accessible, thanks also to the archaeological excavation carried out in collaboration with professors and students of local Al Quds University. The project has achieved an extraordinary result, transforming a degraded and abandoned site into a pleasant place able to show its long history, through the commitment of the local community and a strong mutual exchange.

The project organises artistic workshop for children, working jointly with local school to provide opportunities for growth and suggest future commitments. It also develops micro-entrepreneurial activities of local women's associations, supporting and stimulating the production of handicrafts linked to the territory.

We have also promoted an annual festival to involve local people and make them aware of the cultural resources of the territory, barely survived to the careless building activities and the decay of recent years.

These projects are limited actions, affecting minimally the survival capacity of the Palestinian cultural heritage, threatened by the Israeli occupation but also by Palestinian mismanagement, the lack of both human and financial resources, the frantic rush to new construction, which does not consider the resources of the territory[28]. However, understanding the importance to preserve its cultural identity is a first step for Palestinians to face the challenge of preserving the extraordinary cultural heritage that has been entrusted to them[29].

[28] O. Hamdan, "Problematiche generali di conservazione e gestione del Patrimonio Culturale della Palestina", in *Tutela, Conservazione e Valorizzazione del Patrimonio Culturale della Palestina*, vol. V, ed. F. Maniscalco, Napoli 2005) pp. 13-24; A. Rjoob, "The Impact of Israeli Occupation on the Conservation of Cultural Heritage Sites in the Occupied Palestinian Territories: The Case of 'Salvage Excavations'", in *Conservation and Management of Archaeological Sites*, 11:3-4 (2009) pp. 214-235; S. H. Al-Houdalieh, "The Destruction of Palestinian Archaeological Heritage: Saffa Village as a Model", in *Near Eastern Archaeology*, 69 no. 2 (June 2006), pp. 102-112.

[29] O. Hamdan, "Il patrimonio culturale strumento di comprensione o di separazione nel conflitto israelo-palestinese?" in *Restauro archeologico* 1-2 (2013), pp. 75-78.

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وسط قلب الصراع بين إسرائيل وفلسطين، تكمن سياسة التوسع الإقليمي، التي تسببت منذ عام 1948 في حملة متواصلة لتدمير المشهد الحضري والقرى الفلسطينية التقليدية. فمن خلال احتلال الأراضي الفلسطينية من قبل الإسرائيليين تم هدم الكثير من المنازل وإتلاف الحقول وقلع الأشجار، وتم بناء العديد من البؤر الاستيطانية ومستوطنات فقط يهودية متصلة بشبكة حصرية من الطرق والبنى التحتية لعزل البلدات والقرى الفلسطينية من خلال الخنادق والحواجز. لقد فقد الفلسطينيون أراضيهم وهويتهم، إنهم يستخدمون الآن تقنيات بناء لا علاقة لها بتقاليدهم، متجاهلين البناء بتقنيات الحجر الذي يميز العمارة التقليدية. الدور الحساس الذي يقوم به المهندسين والمعماريين الآن بالمساهمة بشكل لا رجعة فيه في تدمير التراث البيئي والتاريخي. على الرغم من الوضع الحالي وفشل التشريعات في الحفاظ على التراث المعماري، منذ عدة سنوات فقد تم تنفيذ مشاريع تهدف لحماية وتعزيز القرى الفلسطينية من قبل مؤسسات غير حكومية مع نتائج مثيرة للاهتمام. يتم عرض بعض هذه المشاريع في الورقة المقدمة. حيث تم تنفيذها بالتنسيق مع الاحترام الكامل لسمات البناء التقليدية، وإعادة اكتشاف المهارات المنسية وإشراك السكان المحليين، وخاصة النساء والأطفال. عملية "الاستعادة" تفتح آفاقًا جديدة للحياة المدنية والتعايش السلمي.

ABANDON DE KSOUR SAHARIENS ENTRE INDIFFÉRENCE ET DÉSINTÉRESSEMENT

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Béni Abbès, Vieux Ksar. Source : Cliché de Abelkader Labbize, 2012.

This present essay is interested in the causes and consequences of the negative aspect of the abandonment of the Saharans Ksour by taking the question of the indifference with which, the urban managers treat this phenomenon by claiming that the Ksour are no longer places of life capable of meeting the new needs of their inhabitants. But really whose fault is this alarming situation? If this phenomenon of abandonment causes a gap between the representativeness of a heritage culture and the vulnerability of places undergoing social, economic and environmental change. Indeed, despite the establishment of legal and regulatory procedures at different scales of spatial planning, the consideration of the negative aspect of abandonment has been rejected by the local populations. Because, there are few people who are interested in the rehabilitation of the Saharan Ksour. So, to lift the veil on the causes and consequences due to the indifference of all the actors (inhabitants and urban managers), the abandonment of the Ksour raises two problems. On the one hand, the deserted Ksour suffer considerable damage caused by the aging and fragility of buildings due to lack of maintenance. On the other hand, to this deplorable state are added drought, the drying up of water points, soil salinization and land subsidence.

Keywords : Ksour, Saharans, abandonment, indifference, conservation

Introduction

Savoir et comprendre de manière précise comment se caractérise l'effet de l'abandon sur la conservation du bâtiment et du patrimoine historique d'abord sur le plan sociologique, et ensuite sur les conditions de l'aspect alarmant du vieux ksar de Béni Abbès. En première vue, on constate que le dépeuplement du vieux ksar a accentué la vulnérabilité de ses bâtiments et en cela, il en ressort une perte de durabilité qui a rendu tous les bâtiments très fragiles. Tout en suggérant, sous cet angle particulier, que l'ordre de la conservation, concernant l'organisation spatiale, les savoirs constructifs, les structures et le mode d'emploi des matériaux, dont il s'agit ici, est purement le résultat de l'effet de l'abandon, fait singulier dans sa nature et pluriel dans sa généralisation.

Effet de l'abandon

Déterminer en ce sens, l'effet de l'abandon sur la conservation tel qu'il est perçu chez les spécialistes de ce domaine, on constate dès lors que deux sens ont été donnés. Dans sa nature,

FUP Best Practice in Scholarly Publishing (DOI 10.36253/fup_best_practice)
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

l'effet de l'abandon est le produit d'une mauvaise prise en considération par les responsables de la conservation. Dans sa substance, l'effet de l'abandon est un phénomène qui reste préoccupant, car influe sur le dynamisme urbain et la revitalisation durable de Béni Abbès. En cela, au niveau des impératifs de la connaissance de ce fait, il y a celle de la vulnérabilité des bâtiments du vieux ksar de Béni Abbès et celle des faiblesses de la mise en œuvre de la restauration durable du vieux ksar. Par ailleurs, si les spécialistes scientifiques dans le domaine de la conservation affirment que l'effet de l'abandon influe sur la mise en état du patrimoine historique, cela suppose ici que la sauvegarde patrimoniale reste subordonnée à la révision des hypothèses et objectifs de sa gestion.

Effet de l'abandon, fait social

Le fond social de l'effet de l'abandon sur la conservation du bâtiment et du patrimoine historique tel qu'il est vécu dans le vieux ksar de Béni Abbès renvoie au problème de la réappropriation du vieux ksar par la population locale. Mais, ce qui est manifeste ici, c'est la prise de conscience du refus d'habiter dans une architecture de terre. Etant donné que le mode d'habiter de la grande majorité de la population locale a changé. Seulement, il en ressort que l'effet de l'abandon est un fait social spontané qui participe à la dégradation totale des bâtiments ksouriens.

Effet de l'abandon, perception, mesures, délimitation

La perception, les mesures et la délimitation du champ de l'objectif de l'effet de l'abandon sur le bâtiment et patrimoine historique cherchent à avoir une idée globale sur le processus de conservation réalisée à partir des résultats d'études universitaires, déclarations de spécialistes, recommandations d'organisations internationales (CPM[1], ICOMOS[2], ICCROM[3]), organisations nationales (ANSS[4], ANPSMH[5], ASAL[6]) y compris les

[1] CPM, Centre du patrimoine mondial de L'UNESCO, Créé en 1992, Point focal et mécanisme de coordination pour toutes les questions en rapport avec le patrimoine mondial.
[2] ICOMOS, Conseil international des monuments et des sites, est une organisation non gouvernementale dont le siège se trouve à Paris (France). Créé en 1985, il a pour mission de promouvoir l'application des théories, méthodes et techniques scientifiques à la conservation du patrimoine architectural et architectonique.
[3] ICCROM, Centre International d'Etudes pour la Conservation et la Restauration des Biens Culturels, est une organisation inter-gouvernementale dont le siège est à Rome, Italie. Créé par l'UNESCO en 1986, l'ICCROM a pour mission de mettre en œuvre des programmes de recherche, de formation et de sensibilisation du public et de promouvoir la conservation du patrimoine culturel mobilier et immobilier.
[4] ANSS, Agence Nationale des Secteurs Sauvegardés, créée par décret exécutif n° 11-02 du 5 janvier 2011, relative à la mise en œuvre des Plans Permanents de Sauvegarde, PPS.
[5] ANAPMH, Agence Nationale d'Archéologie et de Protection des Sites et Monuments Historiques, créée par le décret n° 87-10 du 6 janvier 1987, elle est chargée dans le cadre du Plan de Développement Culturel PDC, de l'ensemble des actions d'inventaire, conservation, restauration et mise en valeur du patrimoine historique.
[6] ASAL, Agence Spatiale Algérienne, créée par décret n° 02-48 du 16 janvier 2002, est l'instrument de conception et de mise en œuvre de la politique nationale de promotion et de développement de l'activité spatiale.

règles prévues dans les principes de la conservation durable, où s'inscrit le soutien technique et financiers de ces organismes comme opportunité réelle de la revitalisation urbaine. En somme au niveau de la gestion patrimoniale, si l'on veut délimiter davantage le champ de l'objectif à atteindre de par le rôle de la conservation, il faudrait que les règles applicables soient plus ciblées et visent beaucoup plus à s'intégrer dans les plateformes numérisées.

Apport des applications numérisées

La perspective finale de l'apport du numérique à la conservation patrimoniale permet de répertorier facilement dans une plateforme telle que la plateforme du CERIS[7] un grand nombre de connaissances capable d'aider à formuler la bonne conservation du bâtiment et du patrimoine historique. Dans cette mesure, on remarque qu'avec la coopération ICOMOS Algérie, les applications numérisées conçues à partir de programmateurs d'actions de la conservation, sont devenus des outils d'aide essentiels pour la mise en œuvre de la bonne conservation. Ces applications sont pour la plupart générés par les NTIC (nouvelle technologie de l'information et de la communication) et les IP (réseau haut débit). Avec ces nouvelles applications l'acquisition, gestion et diffusion des travaux réalisés sur la conservation du patrimoine peuvent être assurées par l'intermédiaire de services web (Docs-web, Photos-web) et la cartographie satellitaire.

Pour cette raison, la conservation du patrimoine, selon Musso (Musso 2019, p. 147) est « L'opposition permanente entre les polarités extrêmes de la conservation pure (mais jamais possible) et la restauration, nous devons encore prendre position à leur sujet. Suivant le processus progressif d'expansion pour « genre, âge de formation, quantité et qualité» de notre (nos) patrimoine (s), nous devons une fois de plus clarifier ce que nous l'intention avec ces définitions».

Conservation: concept et action

En matière de patrimoine, la notion de conservation est définie comme concept dont il faut construire à partir de la définition de Pittaluga et Fratini (Pittaluga, Fratini 2019, p. 2), qui déclarent d'une part qu'«Il s'agit d'une stratégie basée sur des processus (un processus compris comme une succession de faits ou de phénomènes ayant un lien plus étroit ou moins profond) et des processus à mettre en œuvre à différents moments (à court et à long terme) […] Et d'autre part qu' « il s'agit d'une récupération critique non seulement des bâtiments

[7] CERIST, Centre de recherche sur l'information scientifique et technique, dans le cadre du programme européen PATRIMOINE, Création d'une base de données pour les biens culturels algériens, EU Neighbourhood Info Centre, Algérie, 2016.

Fig.2
La vallée de Saoura. Grand Erg Occidental, Chiché de l'auteure.

Fig.3
Tableau récupératif de l'opération de restauration du vieux ksar de Béni Abbès (avant et après la restauration).

mais aussi des itinéraires réalisés pour le transport du matériel ; c'est une reprise qui peut et doit être réalisée à différentes échelles».

Aussi, dans le cadre de la loi 98-04[8] algérienne, la conservation est un acte permanent destiné à assurer, selon des moyens et méthodes scientifiques et techniques appropriés, la pérennité d'objets et de structures reconnus, exhumés ou mis en relief. La mise en valeur est un acte permanent de conservation par lequel on détermine le rôle et la place d'objets et monuments du passé lointain ou récent dans le tissu socio-économique et culturel actuel. C'est aussi un acte pédagogique et médiatique permettant la circulation du savoir par tous moyens appropriés. Pour Fisch (Giebeler et al., 2012, p. 72), la conservation patrimoniale « regroupe toutes les mesures de recherches de préservation des éléments du patrimoine ».

Selon le dictionnaire des idées (Encyclopaedia Universalis, 2015) «la notion de conservation engage à la fois une théorie et une pratique en rapport aux œuvres du passé, en fonction d'une présentation de l'histoire». Quant aux mesures inhérentes adoptées par les politiques et stratégies du développement durable, il résulte que la représentation systématique de la conservation comme étant une action uniformisante unissant normes établies à partir de chartres [Charte d'Athènes[9], Charte de Venise[10], charte d'Amsterdam[11],

[8] Loi 98-04 du 15 juin 1998, relative à la protection du patrimoine culturel.
[9] Charte d'Athènes 1931, Charte affirmant que l'intérêt de toutes les phases de vie d'un bâtiment se recommande de respecter l'œuvre historique et artistique du passé, sans proscrire le style d'aucune époque.
[10] Charte de Venise 1964, Charte internationale sur la conservation et la restauration des monuments et des sites, dite charte de Venise, est un traité qui fournit un cadre international pour la préservation et la restauration des objets et des bâtiments anciens.
[11] Charte d'Amsterdam, 1975, Charte Européenne du Patrimoine Architectural a été adoptée par le Comité des Ministres du Conseil de l'Europe et solennellement proclamée au Congrès sur le Patrimoine Architectural européen qui a lieu à Amsterdam.

Charte de Washington[12], Charte des RIPAM[13]], conventions internationales et nationales, recommandations du conseil de la commission internationale de l'UNOSCO et préoccupations des spécialistes scientifiques. La présentation de la conservation patrimoniale dans le milieu saharien, en tant que mode d'intervention assurant la mise en état d'une majeure partie du patrimoine historique, montre qu'elle s'accommode aux actions d'entretien, réparation, reconstruction si elle est mieux confortée par les techniques de lutte contre le dessèchement total des matériaux de construction telles que la chaux, la terre, réfection des enduits le craquèlement des palmes des palmiers sous l'effet des grandes chaleurs.

Préoccupations des spécialistes

L'avis des spécialistes de la conservation du patrimoine historique a été établi à partir d'un large éventail sélectif, on cite parmi eux, Pittaluga et Fratini (Pittaluga, Fratini 2019, p. 1617) qui déclarent d'une part qu'«Un autre élément commun est l'inquiétude qui vient de ceux qui conservent tout cela et qui voient divers dangers qui pourraient même compromettre l'héritage dans un futur immédiat (interventions destructrices, non respectant l'authenticité matérielle, l'homologation des langages architecturales…)». «Partager tout cela peut amener chacun à être plus fort pour obtenir les objectifs de conservation et de protection […]».
Ils disent aussi « il s'agit d'une stratégie basée sur des processus (un processus compris comme une succession de faits ou de phénomènes ayant un lieu plus étroit ou moins profond) et des processus à mettre à mettre en œuvre à différents moments (à court et à long terme). Il s'agit d'une récupération « critique non seulement des bâtiments mais aussi des itinéraires réalisés pour le transport du matériel ; c'est une reprise qui peut et doit être réalisée à différentes (Pittaluga, Fratini 2019, p. 1617).
Toujours selon ces deux spécialistes de la conservation « Il s'agit souvent de donner un sens à des fragments. Ce n'est qu'en transformant les fragments de ce réseau infrastructurel en chemins comportant «connaissance» et «usage» qu'il sera possible de redonner un sens à des lieux, « une restauration de sens». Cette «restauration du sens» pourra également restaurer un sentiment d'appartenance à la communauté». En effet «quel équilibre faut-il trouver entre la conservation et la modification d'environnements détruits» (Pittaluga, Fratini 2019, p. 467).
Dans ces déclarations innervent des initiatives d'approche scientifiques pour une conservation durable et écologique. Quant à Hagelstein (Hagelstein 2004, p. 80), il s'agit «de gérer la

[12] Charte de Washington, 1987, Charte Internationale pour la Sauvegarde des villes historiques.
[13] Charte RIPAM, Charte des Rencontres Internationales sur la Préservation du Patrimoine Architectural. Créée en 2005, par des chercheurs, universitaires, historiens, scientifiques du patrimoine, architectes, conservateurs issus de pays et d'institutions du bassin méditerranéen.

conservation du bâtiment et du patrimoine historique par des mesures réglementaires et statistiques». Il importe donc de promouvoir des stratégies nouvelles pour conserver durablement en tenant compte de l'implication de la population locale.

Présentation du site

La Vallée de la Saoura est l'embranchement des cultures de la Méditerranée et des pays de l'Afrique. Elle dispose de très belles oasis qui se localisent entre Bechar et Adrar. Les plus réputées sont celles de Taghit, Beni Abbés et Kénadsa. «La vallée de la Saoura était traversée par la route qui menait vers le Soudan. A l'époque des grands flux commerciaux la Saoura était un axe important du commerce caravanier, d'où certains de ses ksour avaient acquis une grande importance économique parce qu'ils étaient des escales doublées d'une fonction culturelle et religieuse avec leurs zaouïas» (Haridi 2010, pp. 195-218).

Béni Abbès est une oasis animée par l'intensité désertique. Mais en ce lieu incommensurable, on ne rencontre que le merveilleux qui transporte à l'évocation de Calvino (Calvino 1972, p. 63) qui dit «il vient à l'homme qui chevauche longtemps au travers de terrains sauvages, le désir d'une ville». En effet si quelquefois on s'y prend à définir le grand sud, ce n'est ni avant ni après Béni-Abbès, c'est Béni-Abbès. « Quand la ville, une fois l'oued franchi, apparaît lentement, entourée de jardins dans un paysage sublime qu'un soleil troublant l'enveloppe d'une atmosphère pourprée» (Haridi 2010, pp. 195-218). De même, pour Pittaluga, Fratini (Pittaluga, Fratini 2019, pp. 19-129) «La plupart de nos centres historiques ont un charme indiscutable et sont très riches en histoire, culture, savoir-faire perdu des anciens bâtisseurs ».

Dans ce décor contrasté, on y découvre avec étonnement le vieux ksar de Béni Abbès appelé ksar de la palmeraie, classé patrimoine national en 2005. C'est un ksar fortement délabré par l'effet de l'abandon, la vulnérabilité des bâtiments, le malaise provoqué par la désagrégation des valeurs ancestrales des savoir-faire vernaculaires, la lenteur des projets de restauration.

Le vieux ksar assis avec orgueil là, dans sa forme simple que le soleil et le vent ont craquelé ses architectures millénaires, dont «La succession harmonieuse des constructions, qui se déroule sous un ciel clair avec toutes les valeurs ancestrales du bâti vernaculaire» (Haridi 2010, pp.195-218). A cela, on ajoute les observations de Gorges Marçais (Marçais 1945), qui dit que les maisons étaient construites très serrées à moitié enterrées, dans un singulier entrelacs de ruelles couvertes étroites et parfois enfoncées aux formes douces laissant le passage aux pas furtifs. Pour Philippe Marçais (Marçais 1955), le ksar de Béni Abbès, c'est un ksar qui «semble être un ilot dans une mer de palmiers».

Position du questionnement

Alors aujourd'hui on s'interroge sur la mise en état du vieux ksar du point de vue de la durabilité conservatrice. Pour enfin établir de de cet état conséquentiel les bases d'une conservation durable face à la vulnérabilité prépondérante ?

Vulnérabilité: Le phénomène de la vulnérabilité présent dans le vieux ksar est un concours de circonstances à savoir le refus de la population locale d'y retourner vivre dans le vieux ksar. De plus le décryptage de la vulnérabilité du vieux ksar de Béni Abbès a clairement montré l'aspect négatif de l'effet de l'abandon même après la restauration de quelques parties du vieux ksar effectuée entre 2002 et 2012. Le vieux ksar a bénéficié d'une vaste opération de restauration et de mise à niveau pour un coût de plus de 230 millions dinars algériens (DA).

La restauration adoptée a permis la sauvegarde de nombreuses maisons ainsi que des lieux communs comme les entrées du ksar, la place du ksar, place du marché et la mosquée. L'opération de restauration a été secondée par trois chantiers internationaux de réhabilitation organisés par l'Atelier Changasso en collaboration avec l'association Touiza[14] et l'institut méditerranéen de formation et de recherche en travail social a donné des résultats très médiocres parce que les travaux ont été réalisés avec des matériaux inadaptés.

Les travaux ont commencé par l'élargissement des rues au sein du ksar et des voies qui mènent au centre-ville et aux palmeraies, la reconstruction de maisons, le raccordement électrique et l'adduction de l'eau potable. L'opération de restauration avait nécessité le recours à une centaine de petites entreprises et d'artisans locaux.

Mais suite aux intempéries qu'a connues Béni Abbès en 2014, beaucoup de maisons restaurées ont été endommagées par l'effondrement de toitures et la fissuration des murs de murs, même la mosquée de Sidi M'hamed Benabdelsalem s'est effondrée. Les maisons qui ont subi des dommages ne sont que les constructions en tub et avec les troncs de palmier, ainsi que les briques fabriquées à base d'argile, de sable et d'eau.

Durabilité: La durabilité conservatrice du vieux ksar est une action de cohérence essentielle pour le fondement des champs de la mise en valeur de la conservation du bâtiment et du patrimoine historique. Dans ce contexte, le lancement de l'opération de la restauration nécessite un nouveau modèle de conservation formulé à partir des recommandations du développement durable. Ces dernières visent à prolonger la durabilité du bâtiment et du patrimoine historique pour notamment, renforcer la reconnectivité et faciliter la réappropriation du vieux ksar.

[14] Association Touiza: organisation non gouvernementale fondée en 1995. L'ONG Touiza Solidarité est aujourd'hui un acteur majeur de la coopération en Méditerranée, en particulier entre la France et les pays du Maghreb (Maroc, Algérie, Tunisie). Son approche implique la mobilisation des expertises et savoir-faire des deux rives et place l'humain au cœur de la coopération.

Masse critique

Discuter les résultats des travaux de conservation réalisés dans le ksar de Béni Abbès, c'est en vue de préciser que le vieux ksar de Béni Abbès « héritage social des membres d'une société », lieu conçu pour la vie saharienne, est d'aujourd'hui pour les anciens habitants du ksar, déloger par l'armée coloniale en 1957 (Cresti, Amadeo, 1983), un vrai problème. Car la population locale préoccupée par cette situation, souhaite l'implication de la communauté scientifique, notamment les archéologues et les architectes. Les responsables de secteur de la culture de la commune de Béni Abbès et les membres d'associations locales activant dans le domaine de la conservation, veulent relancer des travaux de restauration des maisons détériorées, en confiant cette opération à des entreprises spécialisées et mieux formées ayant le savoir-faire nécessaire de l'emploi des matériaux locaux.
Également, d'après Gérald et Clément (Gerald, Clement 2007, p.49), «Cette restauration a permis de mettre en place des logements au cœur du ksar rénové » mais ces logements sont actuellement pour la plupart inhabitables car détériorés et sans accès à l'eau courante, mais il manque très peu de travaux pour rendre l'habitat possible». De plus pour limiter les défaillances dans les méthodes utilisées lors des travaux de restauration selon Meziane (2014) et Benmalek (2006) beaucoup d'habitants déclarent que: «Les ksour et en particulier le ksar de Béni Abbès ne mérite pas un tel sort irresponsable».
«C'est sûrement, l'indifférence avec laquelle, les gestionnaires urbains traitent la question de l'abandon du ksar, tout ceci est déprimant; mais ce qui a donné cette vulnérabilité progressive des bâtiments, c'est la faute du laisser-aller et l'indifférence de la population locale».
«Mais un problème reste toujours posé, ce ksar vit dans l'ignorance, la vétusté, la dégradation, les mauvaises applications technologiques et la négligence».
«Une fois les petites villes modernes du sud bâties, les ksour désertés par leurs occupants se fragilisent et les opérations de restauration sont de plus en plus coûteuses. C'est le cas d'ailleurs des ksour du sud-ouest saharien qui demeure perdus entre l'originalité des lieux et la modernisation dans laquelle les habitants de ces régions aspirent vivre».
«Pour les travaux réalisés, on voit un manque de contrôle, des réparations qui se font pour les toitures, des ravalements de façades, le colmatage des fissurations de murs à l'aide du ciment, des revêtements du sol avec du carrelage en remplacement du sable».

Paroxysme attendu

L'examen de ces préoccupations montre principalement l'urgence de créer des unités de contrôle lors de l'exécution des travaux de restauration, il s'agit aussi d'effectuer sur

l'ensemble des bâtiments du vieux ksar de Béni Abbès un classement par degré de vulnérabilité des bâtiments du vieux ksar. De même, déterminer le type d'altération des constructions pour permettre une évaluation du degré d'altération des bâtiments par le changement des matériaux du vernaculaire. Mais il importe ici de savoir comment introduire la conservation écologique en tant que mode opératoire capable de mettre en état le vieux ksar de Béni Abbès.

Conservation écologique, solution possible

Dans un passé, le vieux ksar de Béni Abbès répondait aux exigences de la durabilité qui étaient purement écologique. Cette interprétation de la durabilité ne peut se détacher des déclarations de Pittaluga et Fratini (Pittaluga, Fratini 2019, p.176), qui disent que «Les difficultés économiques de telles interventions et le besoin relatif de trouver et de développer des solutions durables sont similaires. […]. Le caractère ancien rend l'intervention, (qu'il s'agisse de réhabilitation, d'ménagement, d'extension, de revitalisation et de modulation), dans ces domaines particulièrement difficiles; cela nécessite l'adoption d'une nouvelle méthode d'approche». Pour Touzeau (Touzeau 2011, p. 38) qui a examiné le structurel de la conservation montre qu'elle doit «plus communément, être comprise de manière dynamique et durable» puisqu'elle puise sa substance de la démarche écologique.

Conclusion

Le vieux ksar de Béni Abbès ne répond plus à la conservation écologique, car sa durabilité ancestrale n'est qu'une notion qui expire de jour en jour. On est loin de la conservation écologique comme solution attendue pour sensibiliser la population locale envers son patrimoine historique. En effet, la conservation patrimoniale est une mesure essentielle de la sauvegarde pour réduire la vulnérabilité dont la dégradation irrémédiable nuit toujours ce témoin d'un passé lointain.

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Ilot Régulier Homogène
Ilot Régulier Non Homogène
Ilot Irrégulier
Limite de la zone d'etude
N

L'ABANDON PROGRESSIF DES HERITIERS DES HABITATIONS DES QUARTIERS D'ORIGINE COLONIALE. CAS DE LA CITE TLIDJENE (EX CITE LEVY) SETIF

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Classification du tracé urbain.

The gradual abandonment by the heirs of dwellings in neighborhoods of colonial era is becoming a constant fact in Algeria.
Sétif as an interior city knew in the colonial period the construction of the district of the residential area; Cite Tlidjene (ex Cite Lévy) made up of small pavilions bordered by green spaces. Currently, the heirs of the same pavilions are very numerous and they refuse to assume the maintenance costs, they prefer to sell it to the first investor, in order to make the land as profitable as possible, the new owners radically are transforming the initial vocation of the district. This leads to architectural and territorial issues, the extent of which varies real estate style between "Bon marché Arabic and French". The analytical approach of the information collected as well as a series of semi-structured interviews revealed the correlation between the urban layout, the attraction of investors in real estate development who took advantage of the absence of regulation of reliable urban planning to transform the urban harmony of this district so that it meets their economic objectives, on the one hand ,However on the other hand they put an end to the conflict of the heirs who are trying to find anti-gentrification formulas and ended the many years of abundant legacy of the colonial era which was really in a state of degradation and consequently to unblock the land situation in the district and to revitalize urban development.

Keywords: Abundant progressive-Cité Tlidjene - colonial heritage - Transformations - gentrification

Introduction:

Le phénomène d'abandon progressif des quartiers d'origine coloniale dans les villes algériennes est devenu une constante .Cela entraîne des problèmes d'architecture et de territoire. En effet ,La ville de Sétif comme ville intermédiaire en pleine mutation, favorise un dynamisme nouveau dans les quartiers d'origine colonial ces quartiers d'habitat pavillonnaire qui se situent dans la première couronne du périurbain de la ville historique (intra-muros) montrent des exemples de transformations par densification de parcelles soit totalement soit partiellement sur une partie de la parcelle tandis que d'autres conservent encore les caractéristiques initiales du bâti et du parcellaire.

Effectivement, ses transformations ont été menées en premier lieu pour répondre aux besoins socio-économiques des habitants pour devenir après un terrain d'investissement de la promotion immobilière et de l'activité commerciale sous l'impulsion de la seule volonté de la rentabilité liée à la spéculation foncière .

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Image satellitaire montrant la situation et les limites de la Cité Tlidjene.

L'étude de la Cité Tlidjene de La ville de Sétif , confrontées à une forte pression foncière et immobilière se trouve actuellement abandonnée par ses propriétaires (les héritiers). les héritiers du même pavillons ,se trouvent très nombreux et ils refusent d'assumer les frais d'entretien ,ils préfèrent le vendre au premier investisseur, Cela entraîne des problèmes tant sur le plan de l'environnement que sur le plan social.

C'est dans ce contexte, qu'il devient important voire impérieux de s'interroger ;

> Quelles sont les vraies causes qui ont mené les héritiers d'abandonner les habitations d'origine coloniale au niveau de la Cité Tlidjene ?
> Est ce que le phénomène se présente de la même ampleur au sein du même quartier (partie arabe et partie française)?.Quel est le devenu du quartier ?

Village des nègres 1921.

Création de la cité Bel Air.

HBM: la Cité Tlidjene (Ex Cité Levy) 1933.

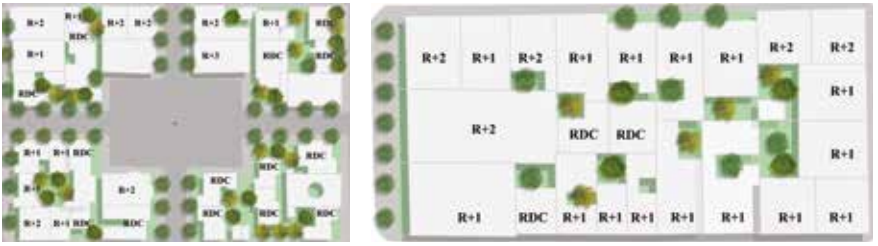
A notre connaissance ,plusieurs auteurs ont traité l'HBM en Algérie ainsi que l'appropriation de l'espace habité daté de l'époque coloniale, tout en focalisant sur les différentes transformations apportées à ce patrimoine immobilier ,au moment ou, peux sont les travaux de recherches qui ont traité l'abondant de ces quartiers à la recherche d'une



corrélation entre le système sociaux économique et la morphologie du quartier. Le cas de la vile d'Oran:(Madjid Chachour et Nadia Belas,2018) ont traité Le cas du lotissement des Castors Familiaux et Traminots (CFT) de Maraval (arrondissement d'El-Othmania à Oran), ils ont mis en scène l'ampleur des mutations des modes d'habiter selon les dimensions pratiques et symboliques de l'espace, en précisant le rôle des transformations habitantes dans l'affirmation du statut social et économique des occupants. Tandis que pour la caplitale ALGER :(Boussad Aïche,2014) a examiné des projets des cités indigènes algéroises et des enjeux qui les ont guidés dans le contexte particulier des années 1930 ,il a apporté un éclairage intéressant sur l'histoire de l'habitat destiné aux musulmans durant l'époque coloniale ,alors que (Nora Semmoud,2007) s'est concentré sur les modalités d'appropriation de la population algéroise après l'indépendance d'un parc immobilier qui ne lui était pas destiné.ce qui concerne les causes de la création de l'HBM a ALger, (Danièle Voldman,2014) a expliqué que :

> Depuis les années 1930, l'agglomération s'était étendue sous les effets de l'exode rural et du dynamisme de la natalité. Taudis et bidonvilles avaient envahi la Ville blanche. Pour enrayer leur développement, la municipalité avait, en 1921, créé l'Office public municipal d'habitations à bon marché (HBM) ainsi que la Régie foncière de la ville d'Alger. Ces organismes avaient entrepris la construction de plusieurs ensembles de logements sociaux, la cité Altairac en 1931, celles de Scala en 1935 et Sainte Corinne-Ouchaya (Oued Koriche) en 1937. à Bab-el-Oued et à Si-di-M'hamed. Mais ils étaient trop peu nombreux pour répondre à la demande des mal-logés, à l'instar de la situation en métropole…

A l'exemple du cas des états unies dont Nous avons opté afin d'éclaircir les différents aspects qui influencent sur le phénomène d'abondant des quartiers d'habitat destinés à la classe moyenne HBM ;(Nussbaum.F,2015) a abordé les quartiers les plus touchés par ce phénomène qui correspondent aux anciennes couronnes industrielles, c'est-à-dire aux portions de la ville développées entre la fin du XIXe siècle et la Seconde Guerre mondiale, en bordure immédiate du downtown. Ces quartiers associent ancien bâti productif et logements ouvriers, constitués le plus souvent de maisons mitoyennes (rowhouses). Certains de ces territoires ont fait l'objet de travaux de réhabilitation et sont gagnés par la dynamique de



Plans de la Classification du tracé urbain: régulier homogène et irrégulier homogène.

gentrification impulsée à partir du downtown (Beauregard, 1990). Les anciennes usines sont alors transformées en lofts ou en ateliers d'artistes, comme cela a pu être le cas à New York (Zukin, 1989), notamment dans les quartiers de SoHo, klyBroon ou Williamsburg. Mais dans la majorité des villes états-uniennes, ces quartiers restent en marge des politiques publiques et de l'investissement privé, constituant parfois des « îlots dégradés » au cœur des villes (Wyly & Hammel, 1999).

(George R. Wagner,1993) ville de Baltimore. L'auteur a utilisé les données des recensements de 1980 et 1990 pour comparer les changements de population, les ventes résidentielles, la valeur des propriétés et la densité des logements.

Le phénomène a été classé de point de vue acteur comme une gentrification artificielle ;cas de Marseille (Silvère Jourdan,2008)

> On distingue la gentrification naturelle et la gentrification artificielle en fonction des acteurs impliqués dans le développement. La première est plus ancienne et est impulsée par la classe dite « de services », apparentée au secteur tertiaire (Thrift, 1987). Les actifs du secteur tertiaire se sont diversifiés en fonction des mutations économiques récentes. Ils peuvent être assimilés à la « créative class » (Florida, 2002). La seconde, plus récente, résulte des acquisitions et des interventions de promoteurs immobiliers, d'institutions financières et de compagnies de fonds de pension sur le bâti.

Photos de la Classification du tracé urbain: régulier homogène et irrégulier homogène.

Dans un article intitulé " *Le foncier dans tous ses états à Sétif : L'architecture défigurée" publié en 2006 par le journal El Watan l'auteur considère ces transformations comme des balafres avec une architecture incompatible avec le passé des quartiers.*

> Les anciens et beaux quartiers, tels Bon Marché, Cheminots, La Pinède, Ladjnane et ailleurs, ont été le moins qu'on puisse dire livrés aux spéculateurs qui ont balafré les quartiers par une architecture pas du tout compatible avec le passé des quartiers n'étant ni conservés, ni sauvés, ni mis en valeur comme l'exigent les élémentaires lois de l'urbanisme. Dans ces quartiers chics où le mètre carré vaut une fortune, la villa cède la place à une promotion immobilière déguisée en construction individuelle.

La cité Tlidjene a été étudié par (Madani,S 2012) ou il a cité Les principales transformations que les deux quartiers(Bon marché et cheminot) ont subis;

> Les changements physiques, Les changements sociaux les changements en thermes d'Usage . C'est dans cette perspective de recherche que nous avons abordé l'analyse des différentes transformations urbaines et architecturales qu'a subit la cité Tlidjene (Ex Cite Levy) Sétif de se focaliser sur les causes qui ont mené les héritiers d'abandonner les habitations d'origine coloniale au niveau de la Cité Tlidjene et les vendre aux investisseurs conscients des opportunités d'enrichissement que l'exploitation de cette ressource immobilière en faveur des démolitions et de récupérations de terrains et la construction des nouveaux bâtiments de la promotion immobilière.

Ainsi, l'objectif de cette recherche est de comparer l'ampleur du phénomène qui se présente vivement a bon marché français qu'a bon marché arabe ."
Après avoir introduire à notre problématique . La première partie proposera une revue de la littérature pertinente sur le sujet, Les méthodes utilisées dans l'étude seront décrites dans la deuxième partie, puis les résultats seront présentés et discutés en troisième partie. Pour finir, la quatrième partie exposera les conclusions principales et identifiera à la fois les recommandations operationnelles.

Conceptualisation ou cadre terminologique de l'étude

Il va s'agir pour nous de présenter les études théoriques sur la notion du quartier
La notion du Quartier

Photos des habitations réalisées pendant la période coloniale: maison avec jardin/cour à l'intérieure Bon marché arabe.

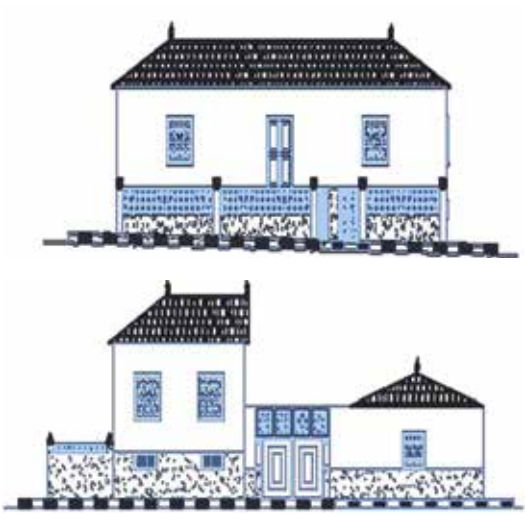
La notion de quartier peut être définie comme un objet d'intervention politique. Le territoire urbain est alors découpé en quartiers composés en secteurs d'intervention politique. Ceux-ci s'appuient entre autres sur des critères socio-démographiques. Nous pouvons définir aussi le quartier comme un produit social qui se manifeste par la formation d'un espace banalisé, modifié, transformé par les réseaux, circuits et flux qui s'y installent. Il s'inscrit dans un champ de pouvoir dont les acteurs procèdent à la partition des surfaces, à l'implantation des nœuds et à la construction de réseaux. Ce territoire urbain est un espace vécu, un support des activités. C'est aussi un espace par lequel s'identifie un citoyen. Ce territoire urbain est construit, aménagé et entretenu par les différents acteurs qui s'y trouvent. Il s'assimile ici, au quartier urbain qui devient pour ses habitants une appropriation, une identité et une représentation. Le quartier comme ensemble socio-spatial apparaît imprécis. (C. Chabanne) pense que « la notion de quartier est d'origine populaire et évoque, à l'intérieur de la ville, un ensemble qui a sa propre originalité. Sa réalité s'exprime par un nom, un lieu-dit, souvent par des socio administratifs et, toujours, par un sentiment d'appartenance des habitants »

Notre étude n'ai pas demeuré pleinement théorique. C'est pourquoi, nous justifions le choix et l'utilisation le quartier d'origine coloniale la cite Tlidjene (Ex Cite Levy) de ville de Sétif comme cas d'étude grâce auxquelles nous avons illustré nos propos. Une fois ce choix effectué, il se trouve indispensable de présenter la zone d'étude.

Photos des habitations réalisées pendant la période coloniale: maison avec jardin/cour à l'intérieure Bon marché Français. + Exemple graphique de type 1.

Présentation de la Cité Tlidjene (Ex Cité Levy) :

Avant que la cité Tlidjene ne voit le jour il y'avait préalablement l'implantation de la cité 'BEL AIR' au Nord Ouest de la ville, en attribuant une pièce par famille afin de deplacer les 876 habitants du village nègre, (Figure N°01-a)



Cette cité de recasement est considérée comme la 1ere vrai extension de Sétif extra muros (Figure N°01-c)- la cité Tlidjene va naitre suite à la décision du 25 juin 1921 de déplacer définitivement le village nègre. Cette manœuvre a été proposée et conduite par Mr Charles Levy, alors délégué financier et président du comité de la société coopérative des Habitations Bon Marché au conseil de la mairie de Sétif, c'est suite a ça que la cité va prendre son nom ;"la Cité Levy" qui deviendra par la suite la cite 'Abderrahmane Tlidjene'

Situé au Sud-Est de la ville de Sétif, la cité Tlidjene est un vieux quartier résidentiel colonial. Le site est d'environ vingt (20) hectares, et il est ceinturé au nord, à l'ouest et au sud-ouest, par la ligne de chemin de fer. Il est limité, à l'est par la cite Kherrata au sud par la rocade (*Figure N°01-a*). La construction de ce quartier a débuté au cours des années 1930. Le plan, en damier, de cette zone fait ressortir une composition orthogonale des rues et des îlots avec une orientation Est-ouest et Nord-Sud. Cette cité, dénommée patrimoine de Sétif, est couramment désignée du nom de son concepteur, Cité Lévy. Elle fut édifiée au sud de la ville au profit des classes moyennes. Elle est constituée de petits pavillons bordés d'espaces verts, et qui sont construits sur des parcelles individuelles de surfaces variables, permettant la création d'îlots de verdure.

Cette cité, conçue au début pour 150 maisons individuelles, la plupart en rez-de-chaussée, compta jusqu'à 220 villas. Toutes les rues sont bordées d'arbres et sans commerces.

Tab.1
Tableau comparatif entre bon marché français, arabe.

Bon marché :CITE TLIDJENE (EX CITE LEVY)		
	Bon marché arabe	Bon marché Français
Surface de la parcelle (m^2)	150-170	200-300
Longueur de la façade (ml)	07-10	15-20
Largeur de la rue (ml)	04-07	07-09
Prix du m2 du terrain (Da)	200 000,00-300 000,00	200 000,00-350 000,00
Les propriétaires des nouvelles maisons	Les héritiers	Nouveau propriétaires riches , immigrés .

Photos des habitations réalisées après l'indépendance composées de maison avec cour à l'intérieure.
+ Exemple graphique de type 2.

Méthodologie de l'étude

Nous tentons d'appréhender notre étude par la combinaison entre l'analyse typo morphologique et socio économique ainsi qu'une série des entretiens semi-structuré au prés des héritiers et des résidants actuels du quartier.

Au niveau du traitement et l' analyse des données : les données collectées lors des différents techniques utilisées ont fait l'objet d'une traduction ,un traitement, après elles ont été cartographiées afin qu'elle soit analysées.

Résultats

l'analyse typo morphologique du quartier a révélé

Classification de tracé urbain

A.Tracé réguliers homogène:

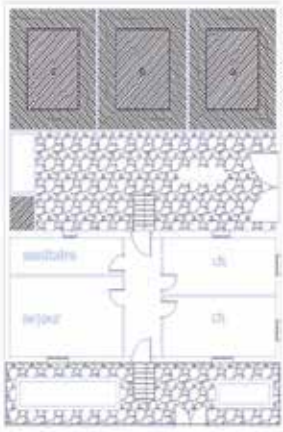
Ce sont les îlots de la partie résidentielle et exactement le bon marche français. Dans cette partie l'îlot constitue une unité physique facilement réparable et constitue au même temps une unité de la structure urbaine des îlots presque identiques .

B.îlots irréguliers non homogène:

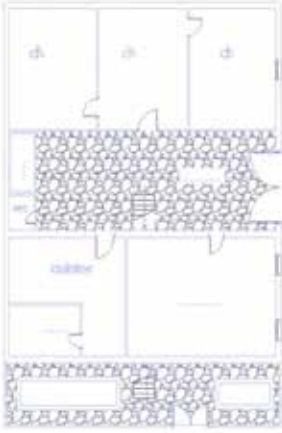
Ce sont les îlots du bon marché arabe , avec des îlots de petite et moyenne taille , facilement repérable du a leur forme géométrique , mais ne constituent pas une unité de la structure urbains par ce que les îlots ne sont pas identiques : forme triangulaire , carre …etc.

C.îlots irréguliers:

Ce sont les îlots de la partie des équipements ou on à des îlots de taille très grande et de forme ne suit que les clôtures des équipements ce qui va les rendre difficilement



plan 1er



plan rdc

repérables dans ce cas le découpages des îlots ou le découpage parcellaire n'a obéit qu'a la politique du « zoning » de l'urbanisme de coût par coût.

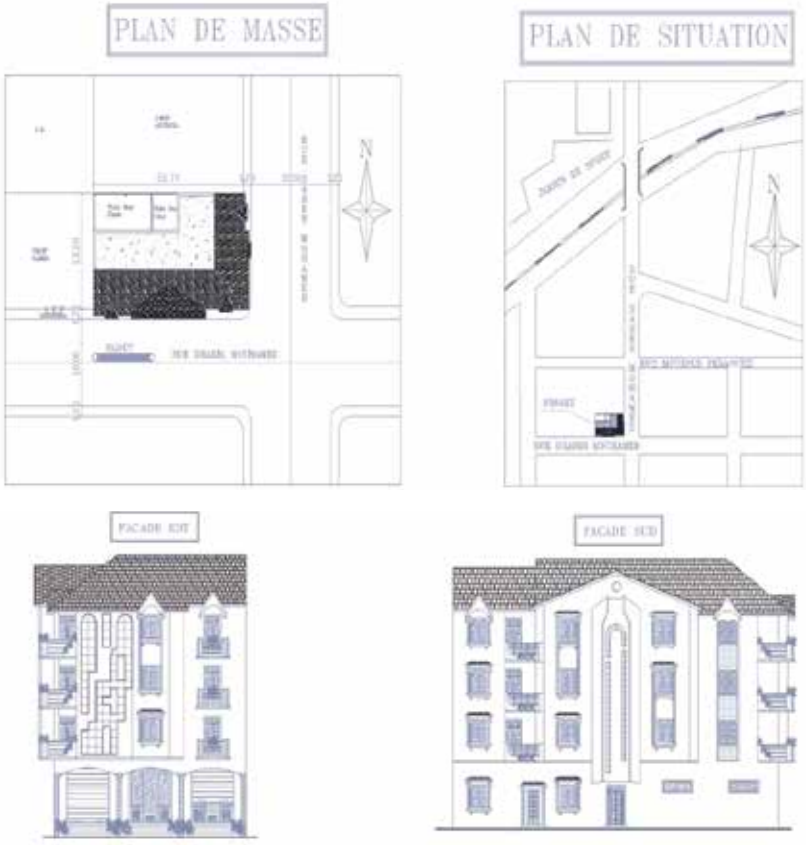
La typologie du bâti

- Type1:

  le premier type se compose des habitations réalisées pendant la période coloniale: maison avec jardin/cour d'intérieur

Exemple graphique de type 3.

Exemple graphique de type 4.



Localisation des activités à bon marché arabe.

Pourcentage des activités à bon marché français.

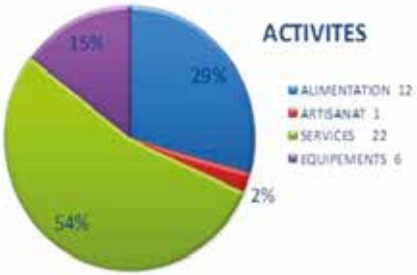
- Type 2:
  Ce sont des habitations réalisées après l'indépendance composées de maison à plusieurs étages avec cour à l'intérieure

l'analyse socio économique

Formules de résistance à la gentrification entre Bon marché arabe, et français

Discussion

l'exploitation des résultats de l'analyse typo-morphologique et socio économique ainsi que la série des entretiens ont bien confirmés la corrélation entre le type de tracé et la valeur foncière qui se diffère entre Bon marché arabe et français et qui reste la cause principale dont les héritiers préfèrent vendre les habitations aux investisseurs.

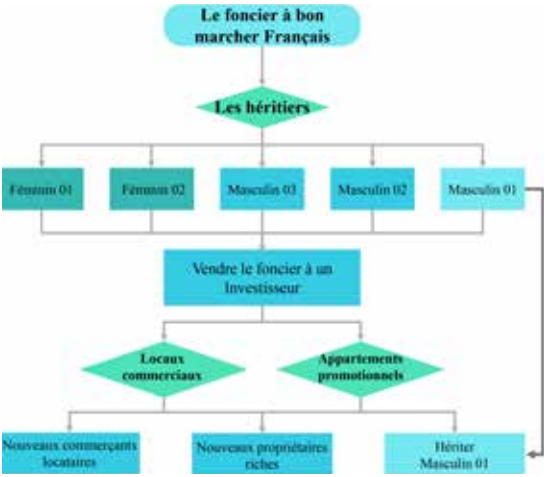


Alors que la relation se manifeste clairement entre la typologie de la parcelle et l'attractivité immobilière des investisseurs ; la largeur de la rue ,la surface de la parcelle et la longueur de la façade qui sont des éléments primordiales pour la conception d'une promotion immobilière a haut standing avec des locaux commerciaux au RDC ce type résidentiel qui viens de remplacer l'ancien pavillon avec jardin de bon marché français ,tandis qu' a bon marché arabe dont le tracé se trouve moins attractif pour les investisseurs ,les héritiers tentent de trouver des formules pour la reconstruction de leurs anciennes maisons en leur propre promotion immobilière (des appartements pour les heritiers et les locaux commerciaux au RDC). Effectivement, en absence d'un instrument d'urbanisme fiable (POS) plan d'occupation au sol de la cité Tlidjene et afin de rentabiliser et de valoriser l'immeuble neuf par rapport au bâtiment colonial édifié de longue date ,les investisseurs et les héritiers apportent des transformations radicales sur la Cité Tlidjene de La ville de Sétif qui recèle une architecture et un urbanisme particuliers de l'époque colonial Cette « transformation » est facilitée par les ficelles filées par des bureaucrates qui jonglent avec les textes, dans le but de s'échapper aux droits fiscaux et à la réglementation régissant la promotion immobilière.

La cite Tlidjene était conçue initialement comme une cité résidentielle, mais suite à son développement, son enclavement et les besoins croissants des habitants, des points d'activité commerciale se sont créées. Ainsi les avenues Saber Mohamed, Djaref Mohamed et la rue Kerkour Diab ont connu une mutation urbaine de résidentielle vers le commercial.

Conclusion et recommandations:

Nous sommes parvenus à conclure que le phénomène de l'abondant progressif du patrimoine colonial en Algérie n'est qu'un Reflet d'une transformation profonde de notre société, de plus en plus attachées aux identités locales, ce phénomène a sans doute une vocation à



Formule de la résistance à la gentrification urbaine entre bon marché arabe.

Formule de la résistance à la gentrification urbaine entre bon marché français.

durer en absence d'une mise à nouveau des d'instruments d'urbanisme qui permette de transformer leurs modalités d'action.

Nous recommandons à ce que L'Assemblée populaire communale (APC) de Sétif veuille sur l'approbation du POS (plan d'occupation de sol) de la cité Tlidjene conformément à un cahier des charges qui répond à toutes les règles régissant l'urbanisme fixant les hauteurs (en mètres prés) des immeubles ainsi que l'alignement .(les avancés et les recules).

En effet le cahier des charge doit détaillé le système constructif ,les matériaux ,exigent l'implantation des façades verdures.

la direction de l'urbanisme de l'hôtel de ville responsable de la délivrance des permis de construire aux entreprises pour ériger en nombres d'étages conforme au dite plan d'occupation de sol et de ne plus octroyer les certificats de conformité pour les projets qui ne respectant pas le cahier des charges.

Les institutions financières seront appelées à éliminée les taux d'intérêt de crédits immobiliers au profit des héritiers afin de leur permettent de devenir propriétaire de logement sur les parcelles héritiers.

Il reste aux habitants d'être au cœur de l'action collective de recomposition de leurs territoires et d'accompagner les services d'état ,afin de faire face aux constructions et transformations illégales ,tout on veillant sur le respect des préconisations des instruments d'urbanisme.

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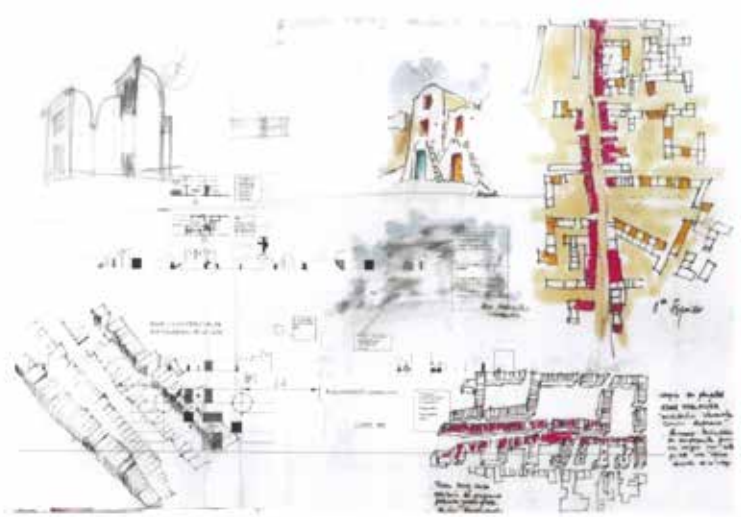

QUELLES STRATÉGIES POUR LA CONSERVATION ET LA MISE EN VALEUR DES KSOURS DU SUD-EST DE LA TUNISIE: CAS DE BÉNI-KHÉDACHE

Faiza Matri
Université de Carthage-Tunisie

Esquisses et plans tirés du projet d'A. Amani, 2016.

The south-eastern region of Tunisia is currently one of the most disadvantaged areas, even though it is characterised by great local wealth. The territory is subject to the constraints of climatic aridity and faced with the difficulty of conceiving a sustainable development based mainly on agricultural activities, current economic policies are mainly oriented towards the valorisation of the local heritage.
In this respect, the State and local authorities have started to become aware of the importance of the Ksourian heritage and made an effort to include these artefacts in their master plans. Architecturally, the ksour are characterised by their strategic location: they either dominate flat ridges or are sheltered in valleys.
Based on the written evidence and morphological analysis, the research examines strategies to be adopted and methodologies to be followed for the conservation and reuse of the Ksourien heritage, with particular attention to the technical-constructive characteristics and cultural potential necessary for the promotion and socio-economic development of the entire region.

Mots clefs: Ksours, Développement régional, Tourisme patrimonial, Tunisie, Architecture

Introduction

En dépit de sa grande richesse culturelle et patrimoniale, la région du sud-est de la Tunisie constitue actuellement l'une des zones les plus défavorisées et dont la majorité de ses villages se trouvent menacés d'abandon.

Dans cette région soumise aux contraintes de l'aridité climatique et devant la difficulté de concevoir un développement durable basé principalement sur les activités agricoles, les orientations actuelles du développement ont favorisé le développement du tourisme patrimonial. La patrimonialisation pouvait constituer une solution pour freiner ce processus de désaffectation et de l'abandon des villages et des noyaux urbains.

En se basant sur l'analyse documentaire et morphologique, le présent travail s'interroge sur les stratégies à adopter pour la conservation et la réutilisation durable de l'héritage ksourien en tenant compte de ses caractéristiques morphologiques et ses potentialités. Le travail est articulé autour de deux grandes parties : la première intitulé *Identification du patrimoine ksourien* a pour objectif de présenter les caractéristiques et les potentialités du patrimoine ksourien, notamment celui de Béni Khèdache en s'interrogeant sur les causes d abondant

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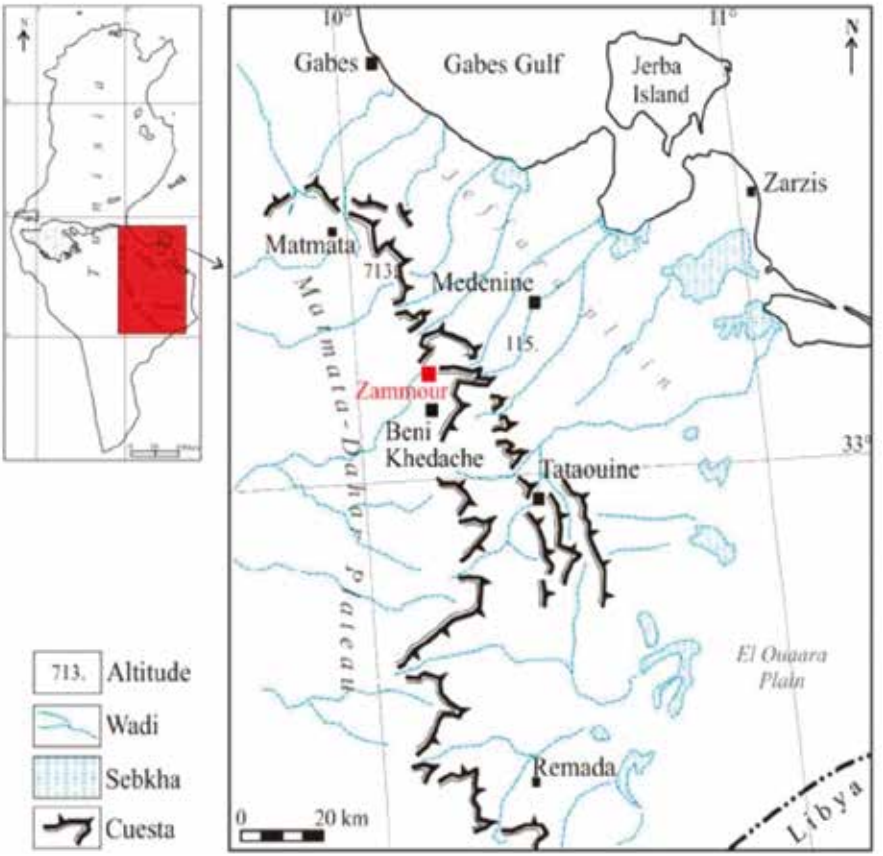


Localisation géographique de la zone de Béni-Khédache sur le plateau de Matmata-Dahar, sud-est de la Tunisie (Source: T. Ben Fraj, A. Abderrahmen, H. Ben Ouezdou, E. Reynard, M. Milano, M. Calianno, J.-M. Fallot, 2016).

des ksours. La seconde partie intitulée acteur, intervenants et stratégies de gestion du patrimoine ksourien, examine les mesures prises et les actions des intervenants pour la gestion de cet héritage en essayant de faire ressortir les défaillances . A la fin des propositions de sauvegarde étudiés par les étudiants de la 5ème année architecture ont été présentés et commentés.

Localisation du village de Béni-Khédache

Située au Sud-Est de la Tunisie, Béni-Khédache est rattachée administrativement au gouvernorat de Médenine. Elle constitue une municipalité et le chef-lieu d'une délégation dont la création remonte à 1956 .C'est une zone à dominante montagneuse

couvrant une superficie de 1381,34 km. (Elle est divisée en treize secteurs ou « Imadas » dont douze) sont situés en milieu rural (Zammour, Ksar Jedid, Bhayra, Oued El Khil, El Menzla, Rahala, Zghaba, Hmaima, Oueijigen, Edkhila, El Fjij et El Benia. Seul le secteur de Béni-Khédache est situé en milieu urbain).

Identification du patrimoine ksourien

Le patrimoine ksourien fait partie d'un système élaboré par les populations autochtones appelées Djabaliya pour la survie dans le milieu hostile caractérisé par à l'aridité climatique. (Selon (Peltier et F. Arin, 1909), sous ce nom de Djabaliya (montagnards), on désigne les habitants des massifs qui forment le rebord du plateau saharien oriental, vers le littoral de la Syrte). Ces populations ont développé des stratégies d'adaptation qui se basent sur deux principes. Il s'agit, d'une part, de la mobilité des hommes et des troupeaux à travers le territoire et, d'autre part, de la diversité des systèmes productifs et des sources de revenu. Dans cette vie active, le ksar constitue le point d'attache aux membres de la communauté. Remplissant la fonction d'un ensemble ingénieux de greniers (H. Abichou, A. M. Jouve, H. Rey Valette, et M. Shaier, 2009, p. 58), il leur permet de se décharger de tout ce qui n'est pas nécessaire dans ce déplacement.

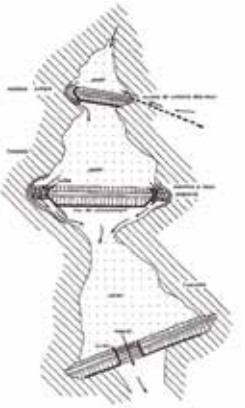
Le ksar : maillon de la chaine de production agricole artisanale

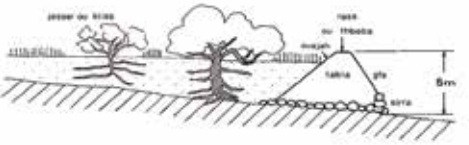
Le Ksar fait partie d'un système pour l'exploitation des ressources naturelles. En effet, dans cette zone, d'étude notamment à Béni-Khédache l'activité économique y est basée sur une agriculture autoconsommée pratiquée dans des conditions difficiles et sur une activité d'élevage très influencée par ces conditions du milieu aride. L'activité agricole de la zone a toujours été essentiellement basée sur la mobilisation et l'exploitation des eaux de ruissellement. En effet, les précipitations qui constituent les seules ressources hydrauliques sont très rares. A Béni Khédache la pluviométrie est faible et irrégulière. Elle atteint environ 230 mm/an (Moussalim, 2009). Pour pallier cette insuffisance de ressources, les *Djebalias* ont eu recours à une technique d'exploitation des eaux de ruissellement en même temps que de retenue de terres : *les djessours* (pluriel de djesser). Il s'agit de banquettes en terre et en pierres sèches barrant les flancs des montagnes. Souvent en une succession de plusieurs banquettes munies chacune d'un déversoir (menfess) destiné à ne pas priver le jesr inférieur d'eau en même temps qu'à éviter une accumulation des eaux de ruissellement menaçant la solidité du mur. (Libaud, 1986, p. 8) A Béni-Khédache, la superficie totale des Jessour est estimée à e 12.000 et 15.000 ha). Derrières ces *Djessour,* les Djebalias exploitent quelques oliviers, palmiers figuiers et pratiquent quelques cultures vivrières (notamment des céréales). Dans cette chaine

Les Jessours autours des ksars à Béni Khédache.

Jessours de Béni-Khédache autour de Ksar Zammour . Source M. Adouani , 2019

Vue du Ksar El Jouamâ dans la région montagneuse de Béni-Khédache qui domine les terrains agricoles. Source Photos :K. Laroussi, s.d.





Schémas de tabias et déversoirs en haut. En bas Profil d'une tabia et de son jesser. Extrait de J. Bonavallot, 1986

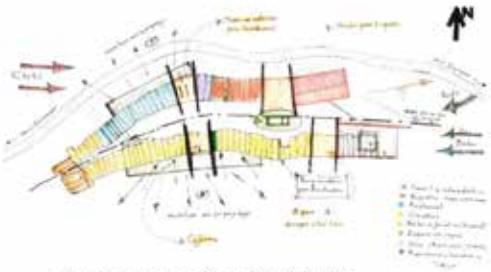
Vue en perspective sur les chambres au premier plan et sur l'administration au fond (source: M. Adouani, 1019).

de production agricole, le ksar qui occupe souvent le sommet de la montagne constitue le grenier collectif pour stoker la récolte. Les Jessour et les Ksour étant deux éléments identitaires majeurs très marquant et structurant le paysage de Béni-Khédache. (Sachant que les *Jessour* sont également trouvés dans les régions de Matmata et de Tataouine, et que les Ksour sont une particularité spécifique de la zone qui s'étend de Tataouine à Béni-Khédache.)

Le ksar : noyaux engendrant la création des villages

Intimement lié aux principaux aspects de la vie, le Ksar se place au centre des mécanismes de la transformation des structures urbaines qui président à la naissance, à la disparition et aux déplacements des centres de forces économiques et politique de la région (Zaied, 2006.)

Dès leurs créations, les ksars ont accueilli plusieurs fonctions : le ksar a servi de refuge, puis il est devenu en temps de paix, en même temps que grenier, un lieu d'échange et de vie sociale, il a aussi rempli les fonctions de marché hebdomadaire ainsi que de lieu



Esquisse du parti architectural du projet

Vue en perspective sur l'espace d'exposition ouvrant sur les Jessours en haut et sur une chambre en bas

Vue en perspective sur les chambres au premier plan et sur l'administration au fond. Source M. Adouani, 2019.

de réunions des hommes. Le principe de l'organisation architecturale des ksars est souvent identique pour tous les ksour de la région. Il est formé d'un ensemble de "ghorfas"- cellules voutés en berceau- parfois à plusieurs étages construites autour d'une cour carrée ou rectangulaire. (Adouani, 2019).

Les ksars constituaient en réalité des noyaux autour duquel les villages ont fini par prendre corps (Zaid, 2006). S'il n'a pas engendré la naissance du village comme dans le cas des ksours de montagnes, le ksar a tout de même commandé la direction des axes de parcours structurant les villages. Ce noyau urbain est un lieu d'organisation sociale et religieuse. On y trouve les lieux de culte mosquée et zaouïa, où on trouve aussi des échoppes destinés aux artisans locaux (forgerons, menuisiers, tisserands et boulangers), des espaces pour l'entretien et la fabrication des outils agricoles, ustensiles de cuisine, armements et fournitures diverses du cavalier (Laroussi, s.d). On y trouve aussi un point d'approvisionnement en eau : la fesquia ou le puits. Les cellules du ksar sont articulées autour de la cour qui constitue un souvent un espace de rencontre et de rassemblement. Selon (Laroussi, s.d) Au centre de la cour carré du Ksar se trouve un local destiné au «Cheikh el Ôrf» pour y régler affaires et litiges au sein de

la tribu et occasionnellement y présider le conseil tribal (le «Miâd». Non loin se trouve aussi l'huilerie traditionnelle creusée dans les flancs de la montagne, juste en dessous du ksar.

Causes d'abandon des ksours et caractéristiques socio-économique du milieu

Les montagnes de la région de Béni Khédache ont été habitées tout au long des siècles par des communautés qui se servaient des habitats troglodytes hérités de leurs ancêtres. Jusqu'au début du XX e siècle les ksars de Béni Khadache ont été utilisés comme greniers et comme lieux d'habitations (Peltier et Arin, 1909). D'ailleurs dès le début du siècle, et même en perdant leurs fonctions originelles de refuge ou de grenier collectifs, les ksars n'ont pas perdu leurs fonctions urbaines pour servir de lieu de sociabilité et de rencontres.

Actuellement la majorité de ces ksours sont dans un état de ruine déplorable. La difficulté d'accès à ces espaces perchés est parmi le raisons de leur abandon. La régression de la situation économique et la pénurie des ressources naturelles et le manque des moyens de production sont aussi les principales causes menaçant les villages du sud-est tunisien d'abandon. Pour Béni-Khédache , la situation actuelle est caractérisée par une régression sur tous les plans. On note une baisse de la population à Béni-Khédache qui totalise selon le recensement de la population de (2014) 2 968, alors qu'en 2004 elle totalise 28.586 habitants. On note aussi une augmentation du chômage des jeunes, surtout celui des jeunes diplômé. Sur le plan économique, la situation est caractérisée par l'impossibilité d'intensifier l'agriculture dans ses formes traditionnelles en raison de limites biologiques. Pour les infrastructures et équipements sociaux et si la délégation de Béni-Khédache est relativement bien dotée en infrastructures de base (routes, télécommunication et électrification), elle ne dispose pas de zone industrielle et elle souffre surtout de l'absence d'un réseau d'assainissement (Moussali , 2009)

La patrimonialisation pouvait constituer une solution pour freiner ce processus de désaffectation et de l'abandon des villages et des noyaux urbains. L'attachement territorial et la prise de conscience des valeurs culturels et matériels locaux peuvent servir de bouclier. (Selon Gravari-Barbas , 2003 « Patrimonialiser un élément permet d'enraciner celui-ci à un espace, et par cet intermédiaire de s'approprier l'espace dans lequel il se trouve, d'opérer une territorialisation. Le patrimoine est ainsi produit de manière à servir de bouclier: il constitue une "valeur sûre" sur laquelle peuvent se construire d'autres revendications, y compris territoriales ». Cependant ces valeurs ne sont pas comprises de la même façon et ne sont pas partagés par tous.

Acteur, intervenants et stratégies de gestion du patrimoine ksourien

La patrimonialisation des objets exprime une affectation collective de sens ; laquelle découle d'un principe de convention. Ce dernier traduit un accord social implicite (souvent territorialisé et institutionnalisé) sur des valeurs collectivement admises ; témoignage tacite d'une indéniable identité partagée. (Selon Di Méo, 2007: « Pour qu'il y ait patrimoine, il faut donc des processus (sociaux au sens complet du terme) de patrimonialisation, soit des modalités bien précises de transformation d'un objet, d'une idée, d'une valeur en son double symbolique et distingué, raréfié, conservé ».

Ces notions ne sont pas neutres et ne sont pas compris de la même façon. Dans les pays du Maghreb et en Tunisie ces notions ont des caractères différents de ceux de l'Occident. Si dans le monde occidental, la conception du patrimoine trouve son ardeur dans le culte des monuments (Riegl, 1984) puisque c'est la vénération des traces tangibles qui fonde le patrimoine (Babelon et Chastel, 2004), la conception du patrimoine dans les pays étroitement liée à la tradition islamique est fondée sur le caractère immatériel de ce qui est transmis. Le mot patrimoine est traduit en arabe par *turâth*, celui-ci renvoie à la notion d'héritage qui, elle, englobe tant l'héritage matériel que spirituel. Face au « culte des ruines » occidental, la conception arabe se consacre entièrement à la dévotion «spirituelle » et se doit parallèlement « plus pragmatique » (Matri, 2018). De ce fait la conservation doit concerner l'aspect matériel et immatériel de ce qui est transmis. Elle doit en outre, mobiliser les acteurs publics, collectivités locales et société civile et la population locale.

Rôle et apport des acteurs publics.

Le processus de patrimonialisation dans le village de Béni Khadache a mobilisé un ensemble d'acteurs privés ou publics qui ont œuvré selon des approches et des objectifs différents ce qui a influencé sensiblement les stratégies de gestion de cet héritage.

D'une façon générale, l'État et les collectivités locales ont commencé à prendre conscience de l'importance du patrimoine ksourien et son insertion dans les plans d'aménagement du territoire. Cependant et en dépit de certaines, actions qui ont pour objectif de conserver des ksour désaffectés afin de les reconvertir en lieux d'art et de culture et participant à la promotion socio-économique de la région à l'exemple de valorisation de Ksar Ouled Debbab et ksar Hadadda dans la région de Tataouine, l'exploitation de cet héritage reste encore insuffisante.

L'Institut National du Patrimoine (INP), le seul acteur public qui a une intervention directe, en menant des interventions financières et des actions de sensibilisation pour la réhabilitation et la conservation du patrimoine local. Il va de soi qu'un acteur tout seul ne peut pas faire

de miracles. D'ailleurs le dossier de l'habitat troglodytique et les ksours au Sud de la Tunisie a été officiellement déposé, en vue de son inscription comme bien en série sur la liste indicative du patrimoine mondial de l'Organisation des Nations unies pour l'éducation, la science et la culture (UNESCO). La liste propose un nombre réduit de ksars : uniquement une vingtaine de ksar ont été proposé alors qu'on dénombre environ 90 ksars encore récupérable.

Rôle et apport des collectivités locales et société civile

Les acteurs locaux avec l'aide des scientifiques se sont engagés dans un Projet de développement rural intégré : « Projet Ksours et Jessours de Béni-Khédache ». Ce projet est né d'une volonté collective "d'agir ensemble", avec l'aide de la recherche. La réflexion scientifique suite au séminaire du CIHEAM organisé à Marrakech sur les stratégies de développement du milieu rural a abouti à la conception d'un projet de développement local valorisant les résultats de la recherche scientifique. Le choix du territoire de Béni-Khédache s'est imposé car il était assez structuré et que les acteurs locaux qui étaient très actifs, avaient atteint une prise de conscience des contraintes de leur territoire et de ses difficultés qui entravaient tout projet de développement. Le projet est concomitant du programme Leadear Méditérrannée. En outre il fait partie du programme « Innovation Rurale en Zones Difficiles (IRZOUD) » développé par un certain nombre de partenaires du gouvernement de Médenine et du département de le Hérault. Ce projet est porté par l'association de développement durable de Médenine (ADD). (Moussalim, 2009).

Ce projet qui tente de conceptualiser de nouvelles méthodes de développement pour les zones rurales difficiles fait le pari d'une implication de la population locale dans sa mise en œuvre.

Le projet a axé son intervention autour de quatre objectifs. Il s'agit de la création d'une activité touristique structurée dans la zone; l'organisation et la valorisation de l'activité artisanale bédouine spécifique au territoire; la valorisation locale des produits agricoles (Figues, fromage, plantes aromatiques et médicinales) et d'élevage locaux ; et la gestion optimale des ressources en eau.

Le diagnostic général de la zone de Béni-Khédache a montré que trois axes pouvaient être développés: le tourisme, l'artisanat et les produits locaux agricoles traditionnels de la zone. (Un quatrième axe « eau et ressources » a vite émergé du savoir-faire local même s'il intègre les trois précités).

L'objectif opérationnel pour l'axe *Tourisme patrimonial*, est la création d'une activité touristique structurée dans la zone qui sera atteint à travers 6 opérations : création de

circuits ; création de nouvelles activités touristiques ; création d'une offre d'hébergement et de restauration, accueil touristique ; mise en valeur des Ksour et Remise en valeur de la palmeraie de Ksar Hallouf.

Le cadre opérationnel et les interventions architecturales du projet portaient sur des opérations un peu disparates qui ne tenaient pas compte des potentialités du Ksar en tant que noyau urbain apte de recevoir des fonctions qui lui permettent de vivre comme un ensemble autonome. En effet, l'architecture du projet portait sur « la réalisation des chambres d'hôte en zone rurale, l'aménagement des points d'information touristiques dans quelques ksours principaux du projet, incluant des lieux d'exposition et de vente de produits de l'artisanat locale ». De ce fait, les actions de *l'Opération Mise en valeur des ksour* ne devaient pas être liés uniquement avec les opérations *Accueil touristique* et *Création de circuits touristiques*, mais elle devait aussi concerner les opérations de la *Création d'une offre d'hébergement et de restauration* qui n'est pas le cas ici.

En effet, la *Création d'une offre d'hébergement et de restauration* a été programmée indépendamment de la mise en valeur des *ksours*. Cette action sera atteinte à travers l'aménagement du restaurant le « Bédouin », l'entretien et la construction de nouvelles maisons d'hôtes.

Ce choix montre que la capacité d'hébergement au village de Zammour est trop faible et que cette carence a été pallié par la construction et l'extension de maisons d'hôtes . Selon (Moussalim, 2009) « L'opération *Création d'une offre d'hébergement et de restauration sur le territoire* a évolué progressivement d'une action d'entretien et d'équipement de chambres d'hôtes préexistantes, chez l'habitant, à celle de la création de maisons d'hôtes indépendantes ». Cependant ces nouvelles constructions ont été faites « par des matériaux non respectueux du site : construction avec la brique rouge qui détruit le paysage et qui ne suit pas l'approche écologique ». (Adouani, 2019 p. 11). En plus et même l'opération de mise en valeur des ksars n'a pas été finalisée puisqu'il y a eu restauration de quelques *ghorfas* de *Ksar* Jouamaa. (Les autres actions prévues dans cette opération, à savoir la restauration de Ksar Jouamaa et Hallouf, le recrutement des agents de développement et leur formation, et la mise ne place des points d'information et de la table d'orientation n'ont pas été réalisées).

Les quelques interventions faites sur les *ksours* se sont arrêtés à la restauration de certaines *ghrofas* pour accueillir des services touristiques trop réduite : Guichets etc. Cependant la conservation partielle du ksar à travers la mise en état d'une partie du ksar en laissant les autres entités désaffectes menace tout l'ensemble et peut causer la ruine du ksar car la dégradation est contagieuse à cause de la dépendance structurelle et la mitoyenneté des éléments constitutifs.

Dans la plupart des projets, les *ksours* ne sont pas perçus comme des entités autonomes qui s'apprêtent à recevoir des embryons de la vie publique et urbaine. Même désaffectés, la

majorité des Ksars conservent jusqu'à nos jours ces atouts et les éléments indispensables à la vie communautaire : lieux de rassemblement, le point d'approvisionnement en eau et les échoppes.

Exemple de propositions faites par les étudiants de la en 5ème année architecture

Dans le cadre de l'Atelier : *Patrimoine culturel et conception* et le séminaire *Architecture et patrimoine* assuré pour les étudiants de la 5 ème année architecture, plusieurs mémoires d'architecture et projets ont été développés par les étudiants et dont les problématiques traitent la question de la valorisation du patrimoine considéré comme un moteur de développement territorial. (Il s'agit d'un atelier thématique l'intitulé *Patrimoine culturel et conception* qui a été dirigé conjointement par moi-même et Monsieur Moncef Dababi architecte. La direction de cet Atelier qui a duré 3 ans (2013-17) a été succédée par un séminaire destiné aux étudiants du même niveau et intitulé *Architecture et patrimoine.* Ces enseignements ont pour objectif de contribuer à la réflexion qui traite les questions relatives à la conservation du patrimoine et sa réutilisation comme moteur du développement).Nous avons choisi 2 mémoires dont la reflexion théorique a abouti à la conception de 2 projets différents élaborés par des étudiants originaires des zones étudiés.
Le premier travail élaboré par (Adouani, 2019) qui se base sur une lecture analytique du patrimoine ksourien du sud-est tunisien a pour objectif la réconciliation entre le nouveau et l'ancien dans le cadre du tourisme écologique afin de limiter les extensions anarchiques dans le site. Après avoir procédé au relevé et l'étude de l'état pathologique du ksar Zammour, il a proposé sa reconversion en un gite rurale et l'intégrer dans un circuit touristique existant de randonnée pédestre. (Le Ksar Zammour est situé à 1,7 km à l'est de Zammour et à 40 km de Médnine via Béni-Khédache. Il est construit au début du XIX e siècle et renferme 100 ghorfas dont 18 sont situé à l'étage.)
Son intervention s'adresse aux visiteurs en leur permettant de faire une escale ou de se loger pendant une courte période. Il s'adresse aussi à la population locale en transformant le ksar en un lieu de rencontre et de sociabilité. Le parti-pris consiste à diviser le ksar en deux entités. La première entité est destinée aux visiteurs renferme des espaces d'hébergement obtenus à travers la reconvention des ghorfas en chambres et en créant un restaurant sans porter préjudice à l'ensemble. La deuxième entité qui est destiné aux habitants du village renferme des ateliers de formation et des lieux d'exposition obtenue selon le même principe de reconversion des ghorfas du Ksar. Un théâtre en plein air a été aménagé dans la cour. Pour ce faire, il a récupéré l'ancienne Kalaa - situé sur le côté est du Ksar et au-dessous d'un petit monticule surplombant une zone rectangulaire. La kalaa

atteint 9 m de longueur avec 4, 30 m de large- et le puits qui sera restauré et remis en service pour rendre au ksar sa fonction originelle en tant que lieu de sociabilité. Les Zones en ruine ont été récupérées pour projeter des espaces conçus selon une architecture moderne minimaliste. Son intervention montre qu'il n y a pas d'opposition entre patrimoine et modernité.
En focalisant l'étude sur Zarzis, une autre zone de Sud- est de la Tunisie, (Assadi, 2016) s'est inspirée des expressions esthétiques de l'architecture ksourienne: Mouansa. (Situé à Zarzis, (gouvernorat de Médnine), dans la petite ville du même nom. Le ksar Mouansa est constitué d'une centaine de ghorfas à trois étages, habité par quelques juifs et meublé par plusieurs boutiques et artisans. Il parait qu'il y avait aussi une synagogue et une vie sociale très riche).
Le système modulaire de composition des ghorfas, le rythme, l'échelle, le parcours et l'équilibre du ksar ont présidé à la conception d'un nouveau village pour des agriculteurs conçus selon une expression moderne minimaliste. Dans l'objectif de retrouver l'esprit des lieux, elle projeté, un tissu homogène formé par l'addition de plusieurs volumes juxtaposés constituant une artère percée longitudinale : la rue principale et qui renferme l'activité commerciale. Ce cheminement est ponctué par lieux de rencontre sous forme de placettes bordés de banquettes qui constituent des haltes dans ce parcours piétonnier et abrité du soleil par les feuillages des oliviers. (Dans le découpage parcellaire du village, les modules utilisées autrefois par les agriculteurs autochtones pour planter les oliviers (500m²) ont été récupérés et intégrés à l'habitat projeté).

Conclusion

L'aridité climatique, la pénurie des ressources naturelles, l'impossibilité d'intensifier l'agriculture dans ses formes traditionnelles et la régression de la situation économique sont souvent les causes d'abandon des villages du Sud-est de la Tunisie, notamment celui de Béni-Khédache.
Cette zone est cependant dotée d'un riche patrimoine culturel matériel et immatériel dont la sauvegarde et la mise en valeur peut constituer un moteur de développement. Dans le processus de patrimonialisation, le patrimoine ksourien, la prise de consciences et la valorisation du patrimoine ksourien devait être prise en considération. Il est essentiel de traiter la question de sa mise en valeur compte tenu de sa charge symbolique, des activités qui peuvent être générées par ce processus. Car d'une part, les travaux de conservation ou de restauration des ksour, utilisant les technologies traditionnelles devraient mobiliser les artisans locaux et les entreprises de travaux publics. D'autre part, après leur restauration et réhabilitation, les Ksour engendrent de nombreux emplois liés à leur fonctionnement et à leur entretien. Cette mise en valeur doit être respectueuse des leurs ses qualités intrinsèques.

De ce fait la sauvegarde de cet héritage et sa mise en valeur est l'affaire de tous: Etat, Collectivités locales, associations, habitants, entreprises touristiques et visiteurs.
L'implication de la population locale est essentielle pour la réussite de tout projet de développement car parmi les causes de l'abandon de l'architecture traditionnelle, notamment les ksours est la conviction qu'elle est dépassée, ne peut pas s'adapter aux exigences de la vie contemporaine et ne peut pas incarner les éléments qui permettent d'atteindre un certain confort. Cette conviction entrave la prise de conscience de leurs valeurs. La sélection des éléments patrimoniaux dépend étroitement du jeu de ces acteurs variés. Elle s'accompagne d'une justification qui peut revêtir des formes différentes, mais qui reviennent toutes à un mode de discours sur les raisons présidant au choix de tel ou tel objet patrimonial (Di Méo, 2007). S'inscrivant dans un principe narratif, ce discours pouvait se construire en dépassant les préjugés. Les exemples étudies ont prouvé qu'une fois restaurés et réhabilités, les ksours peuvent offrir des qualités spatiales et des ambiances architecturales comparables à ceux engendrés par les nouvelles constructions
Sur le plan urbain, les exemples étudiés ont montré aussi que les ksours ne constituent pas uniquement des cellules, mais ce sont de noyaux qui pouvaient engendrer un nouvel ordre urbain et dont leur réhabilitation peut aider les habitants à se les réapproprier en contribuant à créer une dynamique nouvelle de développement durable.

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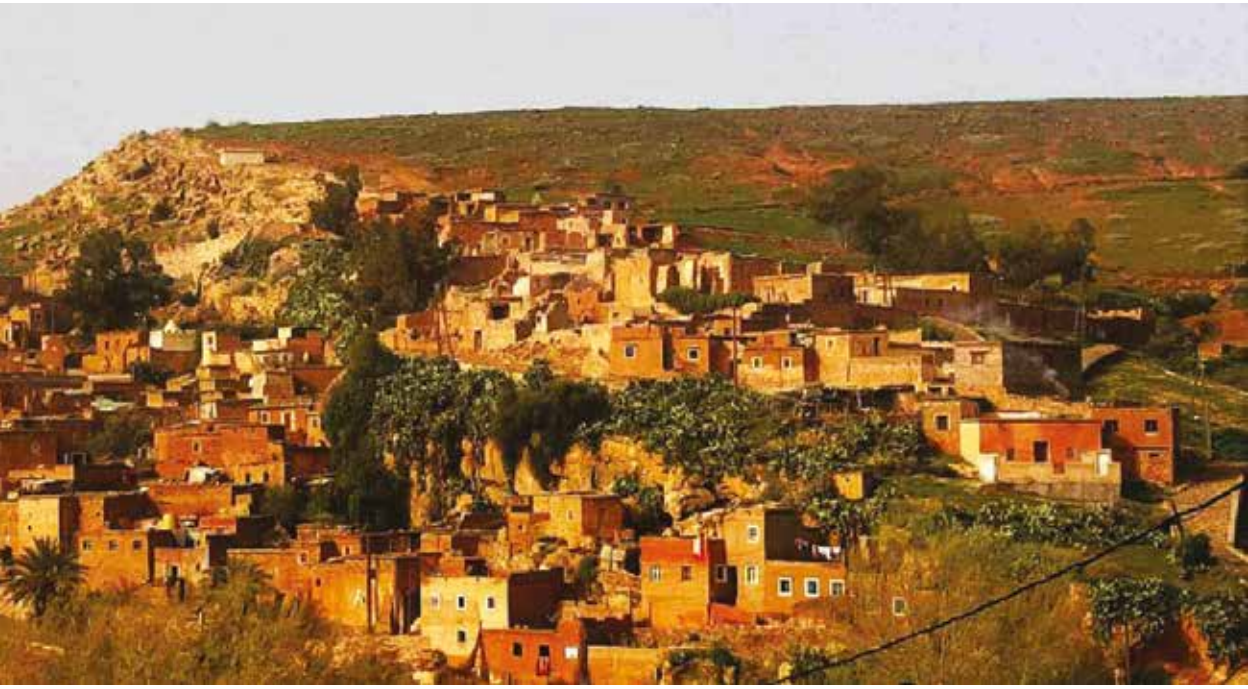

RÉINVESTIR LE PATRIMOINE ABANDONNÉ POUR FAIRE FACE À L'URGENCE DU COVID 19: CAS DU VILLAGE AZRO (HAUT ATLAS DE MARRAKECH, MAROC)

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Vue panoramique sur le Douar Azro perché sur la montagne (Mazirh, 2019).

A few kilometers from Marrakech, in the majestic scenery of the High Atlas, is sited the village of Azro. In this place, sky, water and vernacular architecture unfold in the center of the mountain, forming a harmonious natural and architectural setting, surrounded by land dotted with olive groves, orange and lemon trees. In harmony with these natural elements, a historical legacy consists of emblematic landmarks that punctuate the village, mainly the Zaouia, the mausoleum and a multitude of buildings built using traditional berber techniques. The current ruined state of a group of landmarks threatens the site. Is the village of Azro worthy of such a future? Will the health crisis due to Covid 19 change anything in the perception and future design of this abandoned heritage? Isn't one entitled to expect a better destiny from this place? A rewoven link between its constituents, a controlled development at the service of its inhabitants, a field open to the clean genius and creativity of the new generations? The voluntarist approach proposed for the Douar tends towards a reconversion of an abandoned, unbalanced place, to restore it and give it a new appeal that meets the needs of the population concerned and serve a breathing space for the population of Marrakech through the proposed development that can be adopted in the current epidemic context. Within this framework, the spatial interventions specific to the architecture and urban planning of the Douar could not only bring elements of improvement to the quality of life of the population, but also provide pragmatic solutions to contain this epidemic … and perhaps prevent the following ones.

Keywords: reinvesting abandoned sites - rural heritage - health crisis - distancing.

Introduction

A quelques 35 Kilomètres de Marrakech (Fig. 1), dans les environs immédiats de Tahanaout, un site serti dans le décor majestueux du Haut Atlas, de près de six hectares, s'anime par une juxtaposition de paysages naturels, source de fascination pour plusieurs locaux et touristes. Dans ce lieu de 800 à 900 m d'altitude, le ciel, l'eau et l'architecture vernaculaire s'y déploient en plein centre de la montagne, formant un cadre naturel et architectonique harmonieux, entouré de terrains parsemé d'oliveraies, d'orangers et de citronniers. Connu sous le nom de Douar "Azro[1]", nom géomorphologique d'origine berbère, traduisant la forme du relief lui-même. En effet, le village doit son nom au système constructif majoritairement basé

[1] Azru, en berbère signifie pierre, roche ou rocher

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Cartes de situation du Douar Azro (Inter Carte 2004, modifié 2020).

Vue depuis la route mettant en exergue le milieu naturel du site d'étude (Mazirh, 2019).

Photo de l'ancienne Zaouïa en ruines (Mazirh, 2019).

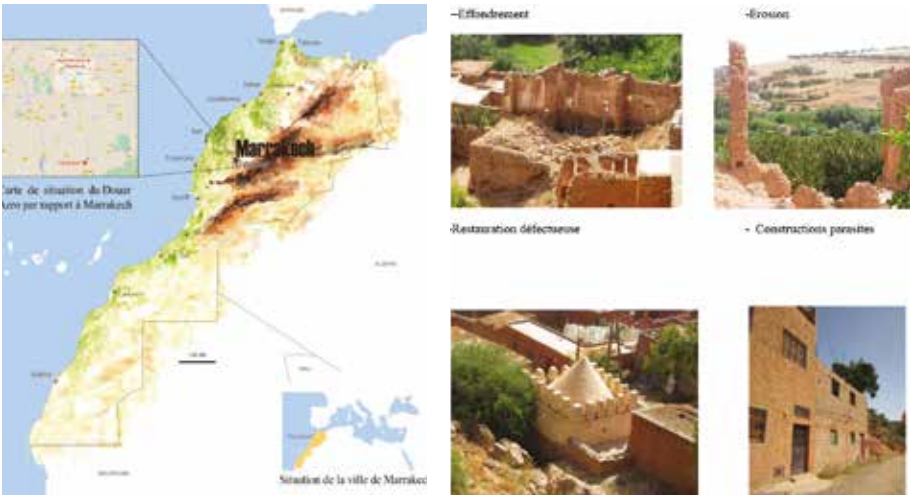
sur l'usage de la pierre présente localement. En harmonie avec ces éléments naturels, un legs historique est constitué de repères emblématiques qui ponctuent le village, essentiellement la Zaouia[2], le mausolée ainsi qu'une multitude de bâtisses construites selon les techniques berbères traditionnelles. L'état actuel en ruines d'un ensemble de repères menace le lieu.

Le village d'Azro est-it digne d'un tel devenir ? La crise sanitaire due au Covid 19 changera-t-elle quelque chose à la perception et à la conception future de ce patrimoine abandonné ? N'est-on pas en droit d'attendre de ce lieu un meilleur destin ? Un lien retissé entre ses constituants, un développement maîtrisé au service de ses habitants, un champ ouvert au génie propre et à la créativité des nouvelles générations ?

Problématique

La problématique soulevée concerne le devenir des territoires extrêmement stratégiques en abandon. La finalité de ce travail n'est bien évidemment pas d'apporter une solution précise, immuable et irréfutable quant aux questionnements posés, mais bien au contraire, d'ouvrir le débat sur les évolutions prochaines de ces espaces suite à la récession mondiale du coronavirus et comment gérer ses séquelles à l'échelle du Douar pour avoir un impact positive sur la ville de Marrakech. Nous envisageons également de penser à l'après crise, au rebond et anticiper la manière avec laquelle nous pourrions profiter de ce rebond. Ainsi l'architecture peut être une piste pour explorer des modes de vie ou des pratiques plus autonomes plus ancrées dans un modèle économique de production locale. Aussi, repenser une autonomie locale permet de réduire de manière drastique l'emprunte carbone qui, dans le domaine de la construction représente un tiers des émissions mondiales. Notre contribution a pour ambition d'ouvrir le regard sur un lieu

[2] La Zaouia est un édifice religieux musulman



oublié, de tirer parti d'une situation mondiale complexe et d'agir pour revitaliser ce site en abandon.

Objectifs

"Réinvestir le patrimoine abandonné et reconvertir ses emprises stratégiques offrant une denrée écologique rare pour le tissu urbain dense de Marrakech", tel est l'objectif de la présente recherche, il est défini suite à la crise sanitaire du Coronavirus. Cette épidémie qui a révélé des constats peu flatteurs sur notre manière de concevoir les villes et d'organiser la société. Une nouvelle configuration pour les territoires ruraux doit être étudiée, nécessitant de comprendre les mutations qui s'opèrent sur ces territoires.

Méthodologie

Plusieurs moyens sont possibles pour appréhender les problèmes posés par les villages en abandon dans une vision de développement post-Covid.

Phase recherche, diagnostic et analyse : Il s'agira de collecter les données qui ont une relation avec la problématique et le site, en faisant une lecture préparatoire des documents, articles et travaux similaires. Puis, mener un travail sur le terrain pour compléter la documentation collectée préalablement. Cette partie sera fondée sur le diagnostic et l'analyse du site pour mieux comprendre ses caractéristiques. On s'interrogera aussi sur les particularités sanitaires du Coronavirus qui auront un impact sur le processus d'intervention sur le Douar.

Phase recommandations et orientations : De ces études découleront les éléments de conclusion consistant à mettre en valeur les potentialités du site et à remédier à ses carences et ses problèmes pour proposer des solutions adéquates.

Phase recherche, diagnostic et analyse

Cette partie constituera une analyse approfondie de l'état actuel sur la base des investigations effectuées, faisant ressortir les potentialités, les contraintes et les enjeux caractérisant le territoire objet de l'étude. Ceci permettra une compréhension plus raffinée de la problématique.

Données générales sur le Douar Azro

Le travail consiste à mener une réflexion sur les différentes dimensions, sur le plan historique, patrimonial, physique, sur le plan des contraintes naturelles et des nuisances et sur le plan socioéconomique tout en intégrant la donne sanitaire actuelle.

Sur le plan physique, le Douar Azro est caractérisé par une topographie forte, ses plateaux déploient une série de paysages variés. Ces vues et perspectives se combinent dans une mise en scène des plus saisissantes et la forte charge naturelle qu'elles procurent interpelle quant à la gravité de l'intervention et son impact sur le paysage. Le Douar est traversé par l'oued Rhirhaya, qui prend sa source dans le Haut Atlas et se jette dans le Tensift, à une dizaine de kilomètres au Nord de Marrakech.

Le site recèle des milieux naturels de flore et de faune, peuplés de différentes espèces d'oiseaux et d'autres animaux ainsi que d'une activité d'élevage florissante (élevage des volailles et moutons). Le village est, par ailleurs, encadré par les montagnes du Haut Atlas, chaine la plus élevée d'Afrique du Nord.

Les contraintes naturelles majeures sont dues à la topographie en pente du site. La construction d'un pont automobile au-dessus de l'oued Rhirhaya a permis de tisser ses deux parties et de faciliter l'accès au Douar. L'essentiel est de bien noter que malgré la construction du pont, l'accès au Douar reste difficile. L'environnement du village est affecté par plusieurs nuisances qui touchent tous ses constituants. Il s'agit de l'eau inexistante de l'oued, causée par la sècheresse. Cette étendu qui deviendra, plutôt avec les temps, une décharges de poubelle avec absence d'assainissement, sera une source polluante grave pour le Douar. A cela, s'ajoutent de nombreuses agressions nécessitant des mesures d'ensemble planifiées pour assainir le Douar.

L'histoire du village est intimement liée à celle de l'oued qui fut vecteur de civilisation depuis les temps les plus reculés et qui est, aujourd'hui classé patrimoine national. La

richesse et la diversité du patrimoine architectural et urbain tiennent aux œuvres léguées par l'histoire, mettant en œuvre un savoir-faire traditionnel que les artisans et maâllems[3] marocains n'ont cessé d'élargir, d'enrichir et de préserver à nos jours.

La dimension socio-économique quant à elle doit prendre en considération le village dans son ensemble. Sa proximité de Marrakech est un atout à exploiter. Le village pouvant être un lieu où s'opérerait le rééquilibrage dont souffrent toute l'agglomération, la création d'un pôle de développement tertiaire semble être un impératif qui s'impose au projet actuel d'aménagement. L'agglomération de Marrakech est par ailleurs caractérisée par le déséquilibre patent qui existe entre les secteurs d'activité basés exclusivement sur le tourisme. Ce dernier est fortement dégradé suite à la crise humanitaire du Coronavirus. La manière avec laquelle la pandémie a été gérée, un peu partout dans le monde, vient redresser certaines règles considérées jusqu'à hier comme nouveau modèle à suivre.

Ainsi toute cette phase initiale de réflexion avait pour objectif essentiel de penser, dans une vision globale, après maturation, toutes les composantes du projet. L'originalité et l'ambition de cette démarche la distinguent de celles qui caractérisaient les projets précédents entrepris dans le Douar. Il en découle une vision d'ensemble dont les axes principaux peuvent être résumés comme suit :

- Le village est un espace écologique dont la sauvegarde est un impérative. Dans son aménagement, la proposition doit comporter l'arrière-pays des montagnes du Haut Atlas et les terrains agricoles environnants.
- Les deux parties du village, séparées par le cours d'eau de l'oued Rhirhaya, doivent être intégrées dans un même aménagement, constituant un pôle d'animation, répondant aux besoins des populations locales et des touristes, en matière de détente, de loisirs et de culture. L'aménagement doit tendre à réaliser l'unicité de l'ensemble du village.
- Les œuvres architecturales en ruines, à grande portée symbolique, doivent être rénovées pour prolonger la continuité historique du site, toujours dans le cadre de l'opération d'aménagement.
- Le Douar "Azro" doit être aménagé dans une optique d'ouverture vers des activités à rentabilité économique sûre.

Données existantes et études complémentaires

Dans le cadre de la vision pré établie, un travail de capitalisation des données préexistantes a été entrepris pour se rendre compte qu'un projet de relevé du Douar a été effectué ne

[3] Maâllems : titre honorifique donné à celui qui peut instruire, qui peut faire acquérir et transmettre un savoir-faire ; (Plus spécifiquement) maître-artisan.

Emplacement du Douar Azro par rapport à la route d'accès R203 (Google map 2020, modifié).

Athologies rencontrées dans le Douar d'Azro en images(Mazirh, 2019).

donnant naissance à aucun document ou étude publiée par l'état ou par un éventuel investisseur privé. Ainsi, un travail de terrain auprès des citoyens et de la population locale a été effectué pour collecter certaines informations, complétées par des connaissances acquises et des recherches établies en fonction de la vision de l'étude. Toutes ces investigations doivent converger vers la proposition d'un projet d'aménagement du Douar Azro, qui met en avant ses atouts et ses spécificités, sauvegarde son patrimoine en abandon et intègre la donne sanitaire particulière du Covid19. C'est dans cette perspective qu'ont été utilisées les données existantes, constituant ainsi un acquis, et identifiées les études complémentaires à engager.

Ainsi, une étude architecturale permettra d'identifier et d'analyser, dans une première phase, les composantes architecturales qui caractérisent tout le bâti dans le Douar. Dans une seconde phase, elle recommande un cadre référentiel d'ensemble : une tonalité, une atmosphère, des orientations, des ambiances architecturales qui vont donner une identité au village. Une identité qui retire sa force du patrimoine ancien existant qui marque l'esprit du lieu. L'effort devra consister à orienter les nouvelles constructions vers une modernité endogène, fruit d'un effort de créativité.

Données techniques

Dans un contexte de croissance démographique soutenu, le système de transport collectif encombré et peu attractif renforce la tendance actuelle au développement du mode de transport individuel (voitures et deux roues) aux dépens d'un système collectif archaïsant.

Les analyses, liées à la problématique du transport, menées dans le cadre de l'étude du Douar, se sont basées en particulier sur une enquête réalisée sur une période d'une journée selon différentes périodes de l'année au niveau du village ; ce qui a permis d'avoir une idée sur les véhicules transitant par le village.

Ces analyses ont montré que seule la route nationale RN203 dessert le village, cette même route nationale reliant Marrakech à la ville de Taroudant et à d'autres agglomérations rurales touristiques (Tahanaout, Asni, Moulay Brahim, etc.) est ainsi fortement sollicitée. Compte tenu de l'extension de ces urbanisations rurales, la route montera en charge rapidement et récupérera également une part de la demande de franchissement qu'elle ne pourra plus satisfaire d'ici les années futures.

Pendant le weekend, le flux de touristes transitant est plus élevé que les autres jours de la semaine. Les analyses du trafic journalier, en traversée du village, montrent que la route a tendance de se saturer aux heures de pointe.

Ainsi, il s'avère qu'une politique volontariste en faveur des transports collectifs, avec notamment la remise en état de la RN203 reliant la ville de Marrakech à ces agglomérations rurales environnantes, aurait un impact déterminant sur la capacité et le développement futur de ces villages.

Pathologie

Les ruines architecturales reflètent la mauvaise gestion du lieu, les principales pathologies relevées sont en relation avec les remontées capillaires, les fissures structurelles ainsi que d'autres dégradations d'origine anthropique. Les pathologies structurelles remarquées sont dues à la méthode de mise en œuvre des matériaux utilisés et au manque de savoir-faire et de qualité lors de l'exécution.

Etant donné l'état de plusieurs constructions au sein du village, des restaurations se sont faites. Cependant, celles-ci n'étaient pas réussies ; plusieurs éléments structurels des constructions ont été refaits en béton armé sont en contact direct avec le sol ce qui causera éventuellement des problèmes de capillarité, le décollement d'enduits et dans les cas extrêmes l'écroulement des structures.

Contexte épidémique global

La situation sanitaire due au Coronavirus conforte la vision d'action tant à l'échelle du territoire de Marrakech et de son aménagement qu'à l'échelle du Douar. Il faudra ainsi redonner sens au territoire rural en abandon et inciter les populations à un retour à la campagne, en proposant un réel projet pour le Douar. Une ville comme Marrakech atteint une densité de

115 habitants au km^2, ce qui la classe deuxième ville la plus dense du Maroc après Casablanca. Or, pour revenir au problème du Covid-19, il n'y a pas plus fort risque de contamination que là où il y a de la densité humaine. Les conséquences immédiates de cette crise sur une ville comme Marrakech, ont été ainsi nombreuses, les secteurs de l'économie les plus perturbés par la pandémie sont : le tourisme, les transports, la restauration, les métiers qui dépendent de l'artisanat, etc.

La population du monde rural marocain, notamment celle du Douar Azro se trouve face à une année de sècheresse. D'habitude, celle-ci pousse une partie de la population du Douar à migrer vers Marrakech où ils essaient de trouver des aubaines dans les secteurs informels. Des opportunités qui disparaissent aujourd'hui avec la pandémie et les mesures de confinement et de distanciation, qui sont décrétées afin de limiter la propagation de la maladie. Aujourd'hui, la population du Douar est ainsi obligée de rester chez elle, subissant de plein fouet les effets de la sécheresse, mais aussi de la crise sanitaire.

Phase recommandations et orientations

Ce volet consiste en la présentation de recommandations permettant de définir les besoins futurs de la population locale ainsi que les enjeux de développement du Douar selon la situation épidémique actuelle. Ces orientations feront l'objet de concertations entre les différentes parties concernées (essentiellement la population) en vue de les compléter, les vérifier et les valider.

Proposition de mesures de préservation

Dans notre cas, un des objectifs est d'arrêter la dégradation de la végétation et de développer le caractère "vert" du Douar. Les mesures de protection de la végétation doivent être adaptées aux conditions locales climatiques et pédologiques et peuvent être résumées comme suit:

- Maintenir une bonne structure des surfaces agricoles au sol ;
- Interrompre l'érosion par différents moyens mécaniques et biologiques. L'intensité et l'importance des interventions qu'il convient d'adopter doivent être proportionnées au danger encouru ; depuis les précautions les plus élémentaires en vue d'améliorer la structure du sol, jusqu'aux mesures beaucoup plus importantes qui s'imposent : création de haies boisées, plantation et reforestation, etc. ;
- Délimiter les zones de pâturage ;
- Suivre l'évolution de l'état de la faune : dresser un bilan sur l'évolution de l'état des lieux régulièrement.

Amélioration de la circulation, de l'infrastructure et de la qualité de vie

Pour assurer la circulation interne considérée quasi absente au sein du Douar, il est proposé d'adapter la RN203 pour pouvoir accueillir au moins deux voies de circulation pour les automobiles et les autobus, et des voies pour les piétons et les deux cycles. Il y a lieu aussi de créer, pour les seuls besoins de l'opération, un itinéraire franchissant le Douar et reliant les nouveaux évènements.

Un mail est proposé qui, partant de la partie du Douar donnant sur la route, franchit le pont puis, contournant les habitations en pierre, pour rejoindre le mausolée puis la Zaouia situés en contrebas du parc de jeux et au final remonter le complexe sportive des jeunes. Un tel itinéraire, établi à 2 voies, est de nature à satisfaire la demande de transport de l'opération.

Ce premier itinéraire sera complété par des voies tertiaires qui pénétreraient tout le village, permettant aux touristes curieux de découvrir les cultures berbères.

Dans les orientations principales qui vont contribuer à la matérialisation de la vision générale, figurent la restitution de l'espace à l'usage public, la restauration des sites historiques existants et l'introduction de nouveau concept tendant à unir de manière harmonieuse le village et à améliorer la qualité de vie des citoyens. Les vocations écologiques s'expriment par la conservation du patrimoine naturel existant en développant un inventaire repérant les espèces existantes, l'énumérant, les classant selon des critères de sélection puis en dressant un plan de sauvegarde. Une promenade piétonne est prévue pour mettre en valeur les potentialités architecturales et aussi les zones dédiées à l'agriculture et à l'écotourisme. La restitution de l'espace public dans la perspective de créer de grandes places, de grands parvis, d'esplanades et des promenades aménagées le long des abords de l'oued Rhirhaya. Tous ces aménagements renforcent les règles sanitaires imposées par la situation actuelle. La Zaouia sera restaurée, la séquence autour abritera un espace symbolique, avec un projet fédérateur, sous forme de lieu de rencontre pour la population du Douar où sera érigé un projet emblématique conçu pour et par la population locale. De plus, un complexe sportif pour la population prédominante en jeune âge sera créé. Le mail créé, animé par diverses activités, débutera depuis la partie à proximité de la route RN203, traversera le pont pour admirer de près le mausolée, le parc de jeux pour enfants, les locaux d'accompagnement des femmes, un centre de santé, etc.

Revitalisation du patrimoine architectural en abandon

Les différentes formes de l'architecture traditionnelle locale trouvent leur plein épanouissement dans le patrimoine marocain. Si les modèles de la ville ont tendance à envahir

l'architecture des campagnes, Douar Azro a une expression artistique qui lui est propre. Loin de céder à l'uniformisation, il a su conserver son identité. Le retour à l'usage des matériaux locaux est une nécessité incontournable et une action qui s'inscrit dans le développement durable. Ce retour ne pourra être fait qu'en commençant par la revalorisation de la construction en terre et en pierre dans les milieux ruraux et ce en ressuscitant le savoir-faire perdu et en modernisant les techniques de construction traditionnelles mais aussi en réhabilitant les constructions déjà présentes, ce qui augmentera aussi la qualité de vie des populations rurales et servira de campagne de sensibilisation.

Proposition d'un aménagement par séquenciation

Le scénario d'aménagement représente la synthèse générale de toute l'étude urbanistique nouvelle du Douar Azro post Covid. Les séquences qui composent le site sont affectées à des usages et à des fonctions propres, entrant dans une cohérence qui répond aux termes de la problématique générale posée :

La première séquence au pied de la route nationale, principal et unique accès au Douar. Elle est restituée à l'usage public à la mise en exergue des entités paysagères du site, accompagnée de zones à caractère commercial, et artisanal.

La deuxième séquence des plateaux du Douar est principalement réservée à une plateforme à vocation culturelle et historique à aménagement différé, avec la restauration du patrimoine abandonné existant.

La troisième séquence verra la création d'un plateau panoramique au sommet du Douar.

Conclusion

Au terme du processus d'étude, en charge d'évaluer de nouvelles méthodes pour réinvestir le patrimoine abandonné, pour faire face à la crise du Covid19, l'approche volontariste globale proposée pour le Douar Azro, à proximité de l'agglomération de Marrakech semble répondre aux interrogations posées au départ.

Par une action volontariste, a-t-on su agir sur un environnement par essence écologique, sans en affecter les constituants ? S'est-on affranchi de ses contraintes sans nous exposer aux risques imposés par l'épidémie ?

L'aménagement proposé pour le Douar, tend-t-il vers une reconversion d'un lieu abandonné, déséquilibré, pour le remettre en état et lui donner un nouvel attrait qui répond aux besoins de la population concernée et servir d'exutoire pour la population de Marrakech ?

A-t-on assumé le poids de l'histoire dans le site tel que nous voulons l'aménager ? Y'avons-nous inscrit une trace identitaire nouvelle, d'aujourd'hui, censée assurer la continuité de cette histoire et la richesse des cultures constructives utilisées ?
Enfin, la novation apportée, quant à l'approche, est-elle assez pertinente, pour assurer l'opérationnalité des choix urbanistiques et architecturaux faits, pour les décennies à venir ? Pourrait-elle avoir éventuellement caractère d'exemplarité ?
Toute réponse affirmative à ces questions ne saurait être que pure spéculation, loin des réalités et enjeux inéluctables à tout projet d'étude ; enjeux qui ne se manifestent que progressivement, à travers le temps. Néanmoins, on ne peut nier que le travail constitue, sans aucun doute, un apport décisif dans la connaissance approfondie du site, dans les propositions d'aménagement nouvelles qui peuvent être adoptées dans le contexte épidémique actuel. L'approche holistique nous invite à reconsidérer les solutions architecturales et environnementales en fonction des directives prophylactiques.
Dans ce cadre, les interventions spatiales propres à l'architecture et à l'urbanisme du Douar pourraient non seulement apporter des éléments d'amélioration de la qualité de vie de la population, mais aussi apporter des solutions pragmatiques pour contenir cette épidémie, et peut-être prévenir les suivantes.
L'approche contemporaine favorise davantage l'usage de la voiture, le minimalisme et un style architectural à caractère international, négligeant les cultures locales et traditionnelles. Cependant, aujourd'hui rien n'empêche d'en revisiter certains concepts pour les transposer. En effet, les riches enseignements tirés de l'histoire du site et des différentes techniques constructives utilisées ont guidé la démarche d'étude du Douar.
La dimension physique du site a été explorée : entités paysagères, vues et perspectives, climatologie ont révélé les atouts immenses du Douar. Ses handicaps et pathologies ont été mis en évidence : ruines architecturales, manque d'infrastructure et d'équipements, nuisances qui affectent le site et son environnement, et ont fait l'objet d'inventaires et d'études pour avoir des propositions concrètes pour y remédier.
Cette connaissance du milieu et de son environnement immédiat et lointain a constitué la matière première à partir de laquelle ont été mis en lumière les vocations du Douar et ses potentialités. Vocations multiples allant de pair avec une séquenciation quasi-naturelle, imposée par l'état actuel des lieux : une séquence au pied de la route, une séquence des plateaux du Douar, et enfin une séquence panoramique. L'élément eau, l'élément végétal, les repères patrimoniaux et leur insertion signifiante dans l'aménagement ont été introduits comme référents principaux devant avoir des rapports étroits avec les établissements humains projetés.
Des projets spécifiques autour desquels pourraient se développer les différents pôles

d'attraction sont inventoriés ; le positionnement de ces projets n'étant pas décidé uniquement pour des raisons de stricte fonctionnalité et de cohérence générale, mais également pour des raisons de composition et de contexte actuel : aménagement d'esplanades, restauration des repères existants et renforcement de l'infrastructure. Des projets d'équipements publics sont planifiés également, pour le rôle "moteur" qu'ils peuvent exercer sur le développement des activités : complexe artisanal, commerces de proximité, centre sportive, parcs de loisirs familiaux, musée historique pour valoriser les techniques de construction traditionnelles.

Enfin, quel regard porter sur cette expérience de revitaliser un patrimoine abandonné à proximité d'une agglomération en pleine expansion telle que Marrakech ? Cette expérience, c'est avant tout une ambition suscitée par la crise sanitaire de Coronavirus. Porteuse d'une dynamique nouvelle dans l'évolution urbaine de Marrakech en général et celle du Douar en particulier, la vision d'étude est surtout soucieuse des préoccupations sanitaires mais encore celles culturelles et socio-économiques des touristes et des populations locales, dans le sens du rééquilibrage de l'ensemble des composantes et leur tendance à l'unicité et à la complémentarité pour la ville ocre.

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TOURISM MARKETING IN THE MEDITERRANEAN ARAB COUNTRIES: A STRATEGY TO RESTORE INTERNAL REGIONS AT RISK OF ABANDONMENT

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The aims of this study is to know the tourism marketing strategies in the Mediterranean Arab countries (a comparative study between Algeria, Morocco, Tunisia) and its effect on the restoration of internal regions neighbourhoods at risk of abandonment.
The results show that despite the availability of tourism potentials in the Mediterranean Arab countries, their tourism marketing strategies have not yet succeeded to restore internal regions, in particular the historic regions which suffer from the risk of abandonment.

Keywords: tourism, tourism marketing in the Mediterranean Arab countries, restoration strategy, internal regions at risk of abandonment.

Introduction:

Cultural richness is one of the main reasons for the trip of the majority of tourists who want to deepen their knowledge by visiting historic sites and museums, recognizing cultural and touristic events such as exhibitions or festivals. Tourism marketing attracts and educates foreign travellers and contributes to the restoration of archaeological sites and traditional industries threatened by risk of abandonment, as well as job creation and the fight against migration, which contribute to the growth of national income and the economic and social development of the country.

Within this framework, many governments have adopted tourism marketing as one of the most important strategies in world politics. The Mediterranean Arab countries as rich countries with their cultural heritages and important tourist attractions also have to deal with tourism marketing and promote tourism, so that they can restore cultural practices and historic sites threatened with risk of abandonment, and thus achieve the development of tourism.

For these reasons, tourism marketing is one of the main factors of progress in the tourism sector; it plays a very important role in transforming tourism into a field of competition between all countries of the world. Each of these countries tries to highlight its tourist wealth in order to conquer a greater part of tourists through the creation of a positive image, and then anchored it in the mind of the tourist according to the different marketing strategies, so that it can restore threatened archaeological sites at risk of abandonment.

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The aim of this study is to know the strategies of the Mediterranean Arab countries (a comparative study between Algeria, Morocco, and Tunisia) to restore the internal regions threatened with risk of abandonment, and to answer the following question:
What is the role of tourism marketing in the Arab Mediterranean countries in disseminating a culture of knowledge of archaeological sites, historical monuments and cultural events and restoring internal regions at risk of abandonment?
Research Objectives:

- Clarify the role of tourism marketing in the definition of tourism regions.
- Knowing the effect of marketing within the tourism sector in Mediterranean Arab countries, to restore internal regions at risk of abandonment, by presenting tourism marketing strategies and programs in Algeria, Morocco, and Tunisia.

The Concept of Tourism Marketing and Its Objectives

Tourism Definition

Tourism is the set of relationships and activities that result from travel or through the movement and residence of people outside their usual place of residence as long as this residence is temporary (Maria, 2016, pp. 18-19).
We conclude from the definition that tourism has three dimensions: mobility, the time a person spends away from his place of residence, and the reasons for the trip.

Tourism Marketing Definition

Implementing tourism marketing means implementing all procedures and initiatives to introduce tourist attractions to avoid being abandoned and forgotten, in order to increase tourism flows and promote the social and economic development of a specific region (Maria, 2016, pp. 19-20).
Tourism marketing is based on stimulating the desires and motives of tourists to visit a specific region, and it aims to highlight the image of the tourist country and focus on its numerous tourist attractions and areas to increase the rate of tourist traffic (Falah, 2013, p. 90).
Therefore, tourism marketing becomes an important factor to restore coastal areas that are at risk of desertion, because owning tourist attractions, whatever their value, is not always considered a tourism resource, if it is not defined through tourism marketing.

The Objectives of Tourism Marketing to Preserve Tourist Attractions

According to the World Trade Organization (WTO), more than one-third of the tourist

trips that take place in the world have cultural goals, and therefore it is the responsibility of each country to attract tourists to visit what it has in terms of tourism, otherwise the tourist area will remain absent from tourist visits, and one of the most important objectives of tourism marketing are the following:

- Familiarizing tourists with the tourism capabilities of the tourist country, in order to avoid abandonment.
- Upgrading services and attractions and make them more attractive.
- Protecting tourist attractions from the risk of abandonment and increasing tourist visits to achieve the social and economic development of a specific region.

Restoration Strategies for Internal Regions Threatened with Abandonment in Mediterranean Arab Countries

The tourism marketing strategy is being developed to revive the inland areas at risk of desertion by the state in order to maintain the competitive position in tourism, and North Africa has known the succession of many civilizations, which made it possess an important cultural heritage if it is well exploited and developed, so tourism marketing strategies are considered as an important factor in marketing its tourist attractions and preserving them from the risk of abandonment. Below we address the most important marketing strategies undertaken by the Mediterranean Arab countries (Algeria, Morocco and Tunisia).

Strategies for Restoring Internal Regions Threatened with Abandonment in Algeria

Historical and Cultural Wealth in Algeria

Algeria is characterized by important natural resources and a great diversity in its natural resources. It is rich in its geographical potentials, as it is the largest country in Africa. Algeria also has many cultural and civilizational sites, some of which are classified internationally within the world heritage by UNESCO, the most important of which are the following: Tassili, the Kasbah district, M'zab valley, the archaeological area of Timgad, the beautiful Roman amphitheater, the Banu Hammad castle, the Ketchaoua mosque, the Great Mosque and others.

The most important museums in Algeria that belong to the ancient Numidian and Roman civilizations are: Sirta, Bardo, Zabana, Fine Arts, Folk Arts, in addition to Algeria's cultural and popular heritage such as traditional industries, and there is also a legacy of customs, traditions, holidays and well-known festivals that attract tourists from Inside and outside the country (Alhathba, 2017, pp. 5-6).

Tourism Marketing Strategies and Programs in Algeria

Algeria has drafted the Tourism Development master Plan (SDAT2025), which is the reference strategic framework for tourism policy in Algeria, and this plan is the document through which the state announces to all actors and all sectors and regions of its tourism project for the horizons of 2025, which translates the will of the state to evaluate natural capabilities, the country's cultural and historical preservation (Ministry of Regional, 2008, p. 4). The main axes of the 2025 Tourism Development master Plan are:

a. General objectives of the master plan for tourism preparation 2025:

- Ensure the involvement of other sectors within this scheme
- Making tourism a contributing sector to the development of the economy and as an alternative to the hydrocarbons sector.
- Reconciling tourism and environmental development.
- Preserving the historical cultural heritage and contributing to local development.
- Permanent improvement of Algeria's image internationally.

b. Dynamics of the Tourism Development Master Plan 2025:

- Increasing the attractiveness and competitiveness of Algeria to become a competitive tourist destination.
- Developing the tourist poles and villages of excellence (POT) and providing them with accommodations, entertainment, tourism activities…etc.
- Partnership between the public and private sectors, by achieving security and managing museums and historical regions to make Algeria more attractive.
- Tourism financing scheme, by encouraging investment in the tourism sector by resorting to tax incentives to attract national and foreign investors and facilitating bank financing for tourism activities in addition to protecting and accompanying tourism institutions and working to avoid stopping them (Ministry of Tourism and Handicrafts).

c. Tourism Quality Scheme (PQT):

It is a strategy adopted by Algeria since 2008 in the Tourism Development master Plan (SDAT), which reflects the state's will to support the natural, cultural, and historical potentials of the country in order to promote the tourism destination of Algeria to the level o f excellence in the Euro-Mediterranean region and to make Algeria a future country for tourists (Ministry of Tourism and Handicrafts i. A., 2014, p. 6). The trademark "Quality of Tourism Algeria" is granted to tourism establishments that commit to adopting quality, by the technical secretariat of the Algerian Quality Tourism Scheme of the Ministry of Tourism and Handicraft (Ministry of Tourism and Handicrafts i. A., 2014, p. 11).

It can be said that although Algeria possesses many important tourism assets, the Algerian tourism sector is still weak compared to the development in Morocco and Tunisia, due to the limited interest of Algeria in the tourism sector and its focus on the hydrocarbon sector as a country that is a producer and exporter of oil, in addition to its weak strategy tourism marketing in Algeria, as there are many tourist assets threatened with deterioration and neglect and began to lose its tourist and aesthetic image.

Strategies for Restoring Internal Regions Threatened with Abandonment in Morocco

Historical and Cultural Wealth in Morocco

Morocco is characterized by a cultural and historical heritage that reflects ancient civilizations that made it possess many historical archaeological sites. As for the most important sites recognized internationally by UNESCO within the world heritage, we mention: the ancient city of Fez, Marrakesh, and the historical city of Meknes…etc, It includes 21 monuments classified as World Heritage.

Among the most important museums in Morocco: the Archaeological Museum, the Museum of Contemporary Arts, the National Museum of Ceramics, and the Museum of Weapons. As for the folk and cultural heritage of Morocco, it is rich in customs, traditions and traditional industries, and Morocco attaches great importance to festivals and holidays within the objectives laid down in the 2020 tourism strategy to value and develop cultural heritage and make Morocco a destination for cultural tourism par excellence (May, 2018, p. 87).

Tourism Marketing Strategies and Programs in Morocco

Morocco, in turn, has sought to give tourism a privileged position in the various economic and social development plans for its developmental role and its positive effects on many economic activities, and tourism marketing in Morocco has focused on many programs that have been developed within the framework of tourism strategies Horizons 2020 to preserve the most important historical and cultural tourist areas:

a. Tourism Product Strategy: The strategy focused on diversifying the tourism product and on its quality to match the needs and desires of tourists.
b. Beach Tourism Strategy: This is by adopting the "Azir 2020" plan in order to make Morocco an international leader in the field of beach tourism.
c. Cultural Tourism Strategy: to revive, preserve and maintain cultural heritage to ensure the influx of tourists.
d. Image Improvement Strategy: By setting up a tourism marketing plan to ensure easy visibility of tourism offers on websites (May, 2018, p. 128).

e. The Strategy of the "Blue Plan": Morocco launched it in 2001 with two visions over a period of ten years (2010 and 2020 Vision), in order to make Morocco within the global tourism fronts by relying on new methods of tourism marketing. The Blue Plan is an important vision, but most of its goals have not been achieved, because of the global financial crisis during 2008, which had a negative impact on the influx of tourists, especially from European countries.

It can be said that despite the great natural and historical capabilities that Morocco has and the priority given to the tourism sector, it has been moving at a slow pace and has not achieved all the desired goals, because of the 2008 financial crisis and the weak exploitation of natural and cultural qualifications, as well as the focus on supporting tourism in some regions at the expense of other regions.

Strategies for Restoring Internal Regions Threatened with Abandonment in Tunisia

Historical and Cultural Wealth in Tunisia

Tunisia has important historical, civilizational and cultural qualifications represented in many tourist sites, cities and museums, the most important of which are: Zitouna Mosque, Carthage, Kairouan, Mahdia, Hammamet, Monastir, and the island of Djerba that goes back to ancient times.

As for the museums in Tunisia, they are: Bardo Museum, Carthage, Folk Arts and Traditions, Oceans and Marine Sciences, Mediterranean Arab Music, Islamic Arts and others. Tunisia is also rich in many customs, traditions and popular cultures, and traditional industries are spread in many Tunisian regions, which encouraged the emergence of many festivals and holidays (Ministry of Tourism and Handicrafts i. T.).

Tourism Marketing Strategies and Programs in Tunisia

Tourism officials in Tunisia attach great importance to marketing as an influential factor in attracting tourists, reviving tourist areas and generating revenues. Tourism marketing in Tunisia has focused on many strategies represented by (Saud & Farhat, 2005, pp. 236-237):

a. Tourism Marketing Strategy: The tourism marketing strategy in Tunisia has focused on the following:

   Building a strategy for marketing domestic tourism in order to encourage it and increase its demand.

   Maintaining a good image of Tunisia as a brand of tourism.

   Building a strategy for public relations, and cooperation with representatives of Tunisian tourism abroad.

The launch of the "Ambassadors Club", whose mission is to add positive value to Tunisia's image, by drawing on various diplomatic representatives abroad and well-known Tunisian personalities.

Activating digital tourism.

Re-prioritizing means and modes of transportation based on the requirements of the new tourism marketing strategy.

b. Quality and Training: These are plans for improving training and quality at the level of various reception structures and infrastructures.
c. Diversification in the Field of Tourism Offers: It is related to developing everything that can be offered to tourists and the various tourist attractions.
d. Financing the Sector: Programs for financial matters are set up to preserve the realized investments and improve the financial position of the tourism enterprises.
e. Tourist Vigilance: aims to anticipate the development that will take place in the future in tourism activity and the behaviour of competing countries, in order to develop appropriate strategies.

The return of the Tunisian tourism sector witnessed a decline in some periods, because of the security situation that affected the influx of tourists, but the tourism sector was able to regain its strength afterwards, through Tunisia's interest in the tourism sector as it is the largest sector that contributes to bring in hard currency.

The Reality of Tourism Marketing in Mediterranean Arab Countries (Algeria, Morocco, and Tunisia) According to the Global Travel & Tourism Competitiveness Index:

The competitiveness of travel and tourism is one of the most important indicators that express the economic strength of the tourism sector in a country, and the World Economic Forum issues a report on the competitiveness of the tourism and travel sector at the global level, and the following tables clarify the position of the Mediterranean Arab countries (Algeria, Morocco, Tunisia) according to The Global Travel and Tourism Competitiveness Index is as follow (Forum, 2017, 2018, 2019):

The Total Indicator of the Tourism Competitiveness of the Arab Mediterranean Countries:

The table expresses the international classification in the field of tourism according to the global travel and tourism competitiveness index, and it has become clear that despite the decline in Morocco's scores globally in 2019, it has made progress over Algeria and Tunisia,

Classification of the Tourism Competitiveness of the Arab Mediterranean Countries Globally during the Period 2017-2019
Source: World Economic Forum, The Global Competitiveness Report :2017, 2018, 2019.

COUNTRIES	2017		2018		2019		Rank change 2017-2019
	Rank	Score	Rank	Score	Rank	Score	
ALGERIA	118	3.07	92	53.8	89	56.3	-29
MOROCCO	65	3.81	75	58.5	751	60.0	+9
TUNISIA	87	3.50	87	55.6	87	56.4	--

and Algeria has also known an important development in the ranking of the travel and tourism competitiveness index compared to 2017, which reached 29 Degree, while Tunisia has maintained the same rank since 2017.

Classification of Natural, Cultural and Travel Business of the Arab Mediterranean Countries Globally in 2017
Source: Prepared by the researcher based on the World Economic Forum, The Global Competitiveness Report 2017, p : 17.

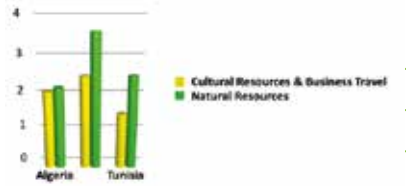
Natural and Cultural Resources and Business Travel Index of the Arab Mediterranean Countries:

The index of natural and cultural resources is considered a competitive advantage in attracting tourists through the number of natural and cultural sites registered in the world heritage, and from the above table it is evident that Morocco scored the highest in terms of natural and cultural resources, followed by Algeria in terms of cultural resources and Tunisia in terms of resources Natural. Despite this, they are late ranks that do not reflect the tourism potentials enjoyed by these countries, given other countries that are in the first ranks in the Global Tourism Competitiveness Report, due to the lack of adequate tourism strategies to exploit and protect these components and introduce them to tourists so that they are not at risk of abandonment, In addition to the security conditions that Arab countries know in general.

Conclusion and Recommandations

The availability of the Mediterranean Arab countries on the tourist assets and potentials such as historical, archaeological and civilizational sites, in addition to cultural activities and traditional industries, alone is not sufficient for tourist attraction. Rather, these elements and tourism potentials must be introduced through tourism marketing, which plays an important role in activating the tourism movement and giving a real picture to the tourist area and their privileges, especially those that are threatened with desertion,

Countries	Cultural Resources & Business Travel	Natural Resources
Algeria	2.1	2.2
Morocco	2.5	3.6
Tunisia	1.5	2.5



which creates a desire for tourists to visit and revive them so that they become successful tourist poles.

The study achieved the following results.

Tourism marketing is an important factor in attracting tourists and promoting tourism products, to help countries market tourist destinations and improve their image in the minds of tourists, as well as preserve them from the risk of leaving.

Although Algeria possesses many important tourism potentials, tourism development is still weak compared to the development in Morocco and Tunisia, due to Algeria's limited interest in the tourism sector and its focus on the hydrocarbon sector primarily as a country that is a producer and exporter of oil.

Despite the great tourism potential that Morocco possesses and the priority given to the tourism sector, it kept moving at a slow pace and did not achieve all the desired goals, but its tourism movement was the best compared to Algeria and Tunisia.

The Tunisian tourism sector witnessed a decline in some periods, due to the security situation that led to the exodus of tourists, but the tourism sector was able to regain its strength afterwards, through Tunisia's interest in the tourism sector as it is the largest sector that contributes to bringing in hard currency.

Morocco ranks first in terms of implementing the tourism marketing strategy to restore tourism areas threatened by abandonment, followed by Tunisia, and Algeria in third place.

Based on the above, it can be said that despite the adoption of tourism marketing strategies by Mediterranean Arab countries, there are many potentials and tourist potentials that have not yet been optimally utilized, which calls for the governments of these countries to intensify greater efforts to revive tourist areas, especially historical ones, which suffer from the risk of abandonment.

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ON THE EDGE OF NOTHINGNESS.
TYPES AND FORMS OF BERBER VILLAGES FROM THE HIGH ATLAS TO THE SAHARA

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Construction of a house from rammed earth, Imilšil, Asif Mllull, Morocco
Photograph by Wolfgang Kraus
While one man is ramming the moistened earth mixture into the wooden frame, several others are busy preparing and transporting the material. Photograph taken May 19, 1985 during ethnographic fieldwork in the central High Atlas mountains in Morocco.
Source: https://phaidra.univie.ac.at/detail/o:1092285.

The paper is a deepening on the mud architecture in the South of Morocco. According to William J. R. Curtis, all the settlements, the *kelaa*, the *agadir*, the *tighremt*, the *kasba* and the *ksar*, have in common the fact of being part of a system of types that is closely interrelated in terms of their formal, functional and symbolic profile. The *ksar*, a rectangular agricultural village built in proximity of an oasis, is the privileged object of his attention. The intrinsic characteristics of the mud are at the base of their cyclical abandonment, in a continuous rebirth from the earth. This fragility does not present a problem as long as the building and typological tradition continues to fuel the "life of forms", always different in their eternal identity to some types which we can define as original. Something, however, has been interrupted in this efficient and virtuous mechanism, 'sustainable', as we would say today, as a result of the epochal transformations which have affected Moroccan society, or rather societies, over the past two centuries. The loss of the perimeter walls marks a point of no return regarding the evolution of the *ksar* type, which perhaps signals the possibility of an 'end'.
In view of all of this, what can be done?
Should we attempt to preserve this world of architectures/villages which seems almost ephemeral when compared to the long-time of history? Or should we accept their present condition, as well as their future, which in some respects seems to be sealed? Can their value (economic/tourism-related) coincide with their mere presence? Is it a material heritage that must be preserved, or rather an intangible heritage of knowledge and know-how?

Keywords: mud architecture, type, ksar, abandoned places, Morocco, William J. R. Curtis, Kasba 64 Group

Earthen landscapes

A photograph by Philippe Lafond which appears in *Haut Atlas. L'exil de pierres* (1982)[1], an account of a long stay in the highest area of the Maghreb, shows a fortified village, a *ksar*, in

[1] *Haut Atlas. L'exil de pierres* (1982) is a book that collects the photographs taken by Philippe Lafond in the High Atlas between the late Seventies and the early Eighties, with a preface by Tahar Ben Jelloun. Together with *Maroc: Les montagnes du silence* (2004), in which the gazes of the photographer and of the writer meet again after more than twenty years, it constitutes a journey of images through the landscapes of Morocco, an essential companion to the volumes that collect the poetic 'city portraits' that were the result of the collaboration between Tahar Ben Jelloun, Bruno Barbey and Jean Marc Tingaud: *Fès. Immobile, immortelle* (1996) and *Medinas. Morocco's hidden cities* (2004).

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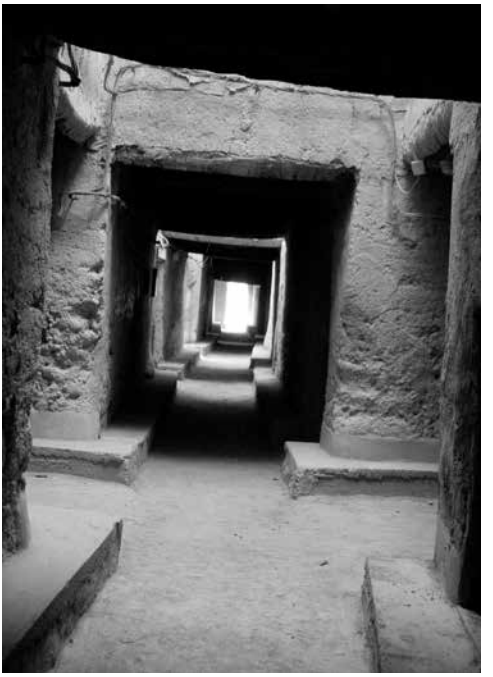
Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Tiġrmt n-ℇli u Muḥ, Ayt Lġazi, Asif Mllull, Morocco
Photograph by Wolfgang Kraus
The tiġrmt was built after 1933 for ℇli u Muḥ n-Ayt Baɛmt, the first chief (lqayd) of the Ayt Iɛzza subtribe under the protectorate. Photograph taken June 30, 1985 during ethnographic fieldwork in the central High Atlas mountains in Morocco.
Source: https://phaidra.univie.ac.at/detail/o:1137838.



Alley of the Ksar Figuig
© Alexandre Keledjian
Source: https://www.flickr.com/photos/dervishe/2744302075/sizes/l/.

Alley of the Ksar El Khorbat
© Djuliet
Source: https://www.flickr.com/photos/meliah/3535692723/sizes/l/.

the region of Imilchil. The caption that accompanies it describes it as an architecture of the past, whose matter was drawn from the terrain and, having exhausted its defensive purpose, slowly returns to the earth, dissolving through the action of rain and wind.
The *ksar* of the Imilchil plateau is the only abandoned place photographed by Lafond. The mud villages, or those made of stones, more common throughout the mountains, especially above an altitude of two thousand metres[2], are still the "fixed stage" of a life that has continued to repeat itself for centuries in the same way, with its rhythms and rituals: the work in the fields, the transhumance of nomadic tribes, the *moussem*[3], the feast of *Aïd el-Kébir* or that of the circumcision.

[2] Among the villages photographed by Lafond: the village of the Aït Haddou Ameur, exceptionally built in raw earth, unlike the villages located at higher altitudes, which use stone; the village of the Aït Haddidou, also in *pisé*; the village of Magdaz, in a valley adjacent to that of the river Tessaout, with its houses in earth and stone that have as many as 5 storeys, many of which are splendid examples of *tighremt*; the village of Amassine, built on the banks of a river, far from any roads, as most settlements in the High Atlas; a village in the region of Tiz'in Test; the village of Tistoutine, with its exceptionally high stone houses.
[3] *Moussem* is a religious/commercial feast that is celebrated in numerous places throughout Morocco during the year. Among the most renowned is the feast of lovers, which takes place in Imilchil in September. More to the south, the *moussem* of the dromedaries of Tan Tan has been inscribed in UNESCO's list of the intangible cultural heritage of humanity.

Yet the question that the authors of the book, published in the early Eighties, seem to ask themselves is the following: how long will all this resist to the process of homogenisation that modernisation inevitably entails?

"Le haut du Haut Atlas est une muraille. Elle isole et préserve […] Ici les hommes ne connaissent du reste du pays que la rumeur. Leur solitude les protège et les nourrit. Ils savent que le monde ne s'arrête pas à la muraille mais préfèrent ne pas aller vérifier", writes Tahar Ben Jelloun in the text which serves as prologue to the images. And in fact, in this region of Morocco the mountains have always protected the local Berber population from Western influences. However, something has changed, or at least has begun to change: "depuis l'arrivée du transistor, ils écoutent les bruits du lointain", and that once impassable barrier has begun to crumble, allowing the seduction of elsewhere to shine through.

In Ben Jelloun's narration, an old patriarch of the village of Tistouitine, in the Aït Oumdis valley, guards the memory of an entire tribe. The description of the house in which he lives, with the humble room lit by candles, the floor covered with mats and carpets, and some scenes of family intimacy are the occasion for a reflection on life and death, on their serene acceptance of them as something that is absolutely natural. It also refers to a unique relationship between man and the earth which is inevitably reflected in the forms of the architecture: "Ici, l'abri est d'abord conçu pour les bêtes. L'homme et sa condition sont secondaires". The author entrusts to the words of El Hadj, the old family patriarch, the bitter observation of a new form of life, characterised by the fact that the young emigrate to the plains or the cities, attracted by the illusion of an easier life: "Nous vendrons le bétail, et ceux qui le peuvent partiront dans les plaines ou même dans les villes. Ils iront chercher du travail ou… mendier. Ce sera notre défaite et la fin…".

The landscape appears in all its sublime beauty: from the plateau of Imilchil to the Haut Dadès, from the grazing land of Talmest to the region of Djebel Azurki, from the springs of Tessaout to the pass of Tiz-in-Test, arid valleys alternate in the infinite nuances of the earth, gorges which are several hundreds of meters deep, abundant springs and torrents on whose banks birch trees and centennial walnut groves grow, and the broom flower blooms. The colour of the architectures blend with their surroundings and complete the appearance of the places with their shadows and geometries. The village of the Aït Haddou Ameur is almost indistinguishable from the plateau surrounded by fields on which it stands, while that of Magdaz punctuates the slopes of a valley the color of rust red with buildings made of earth and stone, many of which are *tighremt*.

> Le versant sud de l'Atlas aurait pu être une prairie – concludes Ben Jelloun – De vallée en piste, de chemin tracé par l'âne en oasis, l'œil suit le parfum de la terre imbibée par la nuit brève. On foule

> aux pieds des bestioles argentées, des pierres ciselées par le vent. On atteint la porte des plaines. Ici des jeunes femmes cultivent des roses. Elles les cueilleront au printemps.

We have left the High Atlas behind and the Sahara appears majestically below.

The *ksour* of north-western Sahara

During that same crucial decade of the Seventies, William J. R. Curtis explored the valleys of the south-eastern face of the High Atlas, discovering an extraordinary fertile and luxuriant world: the constellation of oases generated by a dense network of streams[4], before they completely dry out in the desert.

Yet if Lafond and Ben Jelloun's journey is almost intimate in its reliance on the refined tools of narrative and photography, that of the young British architecture historian is translated into an in-depth scientific description of the morphology and typology of the villages and of the local mud architecture: *Type and Variation. Berber Collective Dwellings of the Northwestern Sahara*, published in 1983.

The importance and topicality of his research reside, in addition to providing an exceptional depiction of a little-known territory, in the methodological approach used for describing the multiple variants of the said settlements, all of which fortified and having in common the fact of being part of a system of types that is closely interrelated in terms of their formal, functional and symbolic profile[5]: the *kelaa*, a fortified village with an irregular plan perched on the top of a hill or of a rocky crag, used seasonally by nomadic peoples; the *agadir*, a collective storehouse which often carries a holy aura, due to its precious content or to the presence of the tomb of a saint; the *tighremt*, a castle-like settlement which combines dwelling and storage functions; the *kasba*, an actual fortress, similar to the previous in shape, yet the expression of a transformed political situation which during the late 19th century had established a specific strategy for controlling the territory; and finally the *ksar*, a rectangular agricultural village built in proximity of an oasis, privileged object of his attention. His is an approach based on direct experience[6], as well as on a detailed reconstruction of sources and previous studies, the latter carefully purged of any ideological component linked to either the French colonial period or to the more recent phase concerning the regained independence.

The typological abstraction and the definition of some universal composition principles

[4] The region studied by Curtis is the area to the south-east of the High Atlas between the Dadès, Gheris, Ziz and Dra rivers.

[5] The classification of these types is based on the studies by Robert Montaigne (1930), Henri Terrasse (1938), Djinn Jacques-Meunié (1949), Lloyd Cabot Briggs (1958) and the Kasba 64 Study Group (1973).

[6] Curtis himself informs us, in a note in his article, of the two journeys to the oases of south Morocco, undertaken in the Summers of 1978 and 1981.

through which to understand the numerous variations to the form derived from its adaptation to the climate, the orography, technology, the social, economic and religious structure, as well as to symbolism and history, lie at the core of Curtis' reflection since, as Raphael Moneo points out in his essay *On Typology* (1978), published in «Oppositions», "to raise the question of typology in architecture is to raise a question of the nature of the architectural work itself". In his analysis of Berber settlements in north-western Sahara, in a fine balance between uniqueness and belonging to a system of 'objects' with a common formal structure, Curtis offers a fundamental contribution to the consolidation of typological analysis, and he does so by applying it to architectures and urban systems which lie outside of the usual Western canon, almost as if confirming its widespread validity.

Yet, like Ben Jelloun and Lafond, also Curtis was aware of the epochal transformations which were affecting the world of the oases: the sudden mechanisation/industrialisation of agriculture, mass-tourism which was reaching once remote and isolated places, or the invisible radio waves which in the prologue to the book *Haut Atlas. L'exil de pierres* were described as having the power to bring down cultural barriers. Thus, the progressive fading of the defensive function between the late 19th century and the Declaration of Independence, and the ensemble of the said transformations explain the more recent typological alterations of the *ksar*[7], and even its abandonment:

> An architectural type – he affirms – will only be repeated so long as it continues to serve its purposes satisfactorily, and so long as the cluster of conditions which made it a useful solution continue to have an influence. If either human intentions or external circumstances are altered, then the type will have to be stretched, modified, or even replaced. Modifications will be no problem if the type has some flexibility, but if the kernel aspects are threatened then fragmentation and collapse will ensue. Normally, to judge from the history of types, such a crisis will be followed by a period of searching, after which will come the creation of a new synthesis.

Protected by high, defensive walls, the *ksar* shows a fortified and on occasion martial character, introverted and anti-perspectival, reinforced by robust corner towers, and opens toward the outside through a single access (almost) always oriented to the east. A threshold between what is familiar and known and what is alien and potentially dangerous, the great gate introduces to a small square, a mosque and a *hammam*, the only recognisable collective buildings within an otherwise compact fabric of courtyard houses and very narrow streets. Its proportions and decoration reveal to the exterior the highly civil role of the public spaces that gather around it, and its function as true *forum* for the inhabitants and as *limbo* between the *ksar* and the rest of the world.

[7] In its latest formal translations, the *ksar* has lost the perimeter walls as a result of the disappearance of defensive requirements (Curtis, 1983, p. 205).

Skoura, Kasbah Amridil

Source: https://www.flickr.com/photos/daper69/8521739597/sizes/l/.

The houses of the *ksour* in this part of the Western Sahara are generally organised on two storeys, distributed around a central courtyard. In a gradual evolution of the public sphere into the private one, the ground floor is used for the shelter of animals and / or the collection of water and food while the first floor is reserved for the life of the family, with the living room-kitchen in the centre, around the bright void of the courtyard, a small bedroom at the bottom and sometimes, near the stairs, a guest room. The terrace, finally, is the place of women, intimate and safe, open and airy, although often a covered section offers shelter during the hot Summer nights. In the distribution of the plan, the presence of two more narrow zones, perpendicular to each other, at the edges of the large central room where the connection to the sky takes place, contributes to strengthening the load-bearing structure of the house and to perfect the hierarchy between served and service spaces. The latter include the entrance, the vertical connections and the storerooms.

It is certainly rare for a type to be repeated in its pure form and it is rather the modifications to it that confirm its structuring role in relation to the said form. Thus, it is possible to find *diar* in which the living-room is located on the ground floor, examples in which volumes are added either in height or toward the exterior, over the alleys, or other more recent ones in which, considering the disappearance of the need to share party walls for defensive purposes, the ensemble of the exterior walls can contribute to the airing and lighting of the interior spaces. It is also common to find typological exceptions to the *ksour*, non-only in terms of size, but also of composition: a gate placed in a gap between two not coplanar parts of the façade (see, for example, the *ksar* of Tawouhait), a *tighremt* at the centre of the plan, or a double wall perimeter.
In the very particular micro-climate of the oases, mud is perhaps the ideal building material, due to its availability and high thermal inertia, which allows the walls to keep the house cool during the day and warm at night. Its use is made possible by the low atmospheric humidity which ensures salubrious interiors, yet requires some devices, such as the use of a stone base which serves as mediator between the damp soil and adequate protections from the occasional rain and the strong western winds. The use of thick walls without openings inevitably determines the choice of a courtyard house, whose proportions in height are modulated in function of a careful *sciographia*. The control of sunlight and of the exterior exposed surface, finally determines the principles of aggregation and the reduced section of the streets.
However, although it is true that the use of mud is a necessity, the material loses all deterministic meaning in the definition of the form of architecture, since it is impossible to disengage it from the historical understanding of the life of man in the oases and in the valleys. The choice of mud as a material transcends its mere functionality to become a cultural element, almost a tradition, capable of conferring to the architectural elements a sort of immutability in the centuries-old construction of an earthen landscape.
Curtis invites us to inquire into the cultural and human components of architecture without, however, establishing biunivocal correspondence between social and architectural forms. The social complexity of the peoples from the oases – which he tries to reconstruct with the help of the studies by Henri Terrasse, Ross E. Dunn, Robert Montagne, Ernest Gellner and Pierre Bourdieu, among others – is too vast, between the resilience of the Berber culture and attempts at integration with the Arab invaders, uncertain origins, very ancient tribal affiliations, conflicts and alliances between nomadic and sedentary groups, political structures repeatedly subjected to external influences, and finally the French colonisation period in the last century.
Yet he suggests above all possible symbolic meanings for the typical four-square plan, with the great gate and the mosque next to it magnetically oriented to the east, always remaining, however, in the field of pure hypothesis:

Ksar
© orientalizing
Source: https://www.flickr.com/photos/orientalizing/16394518517/sizes/l/.

Just as Berber social forms – he writes – blend many historical influences with ancient patterns, so the eastward placement of gate and communal spaces can be related to ancient mythical meanings. The fact is that the *ksar* as a whole has a remarkable mandala-like character, and that this particular image of wholeness is aligned with the main cardinal directions. May it not be possible that we have here an example of Islamic conventions lying over a substructure of Berber belief in such things as the renewing power of the sun or the regular shape of the cosmos? Is the *ksar* a representation of some sort of ideal world? […]
Perhaps […] the Berber world of the imagination is haunted by magical forces related to a mythopoeic vision of nature. Beneath a surface crust of Islamic customs lies a seething world of ideas related to the grand themes of fertility and renewal, the sun and the planets, the water and the earth. Surely in the stocky and vital shapes of the *ksar* one recognizes the impact upon the imagination of the trunks of the date palms which literally (and perhaps mythically) supported the oases through the centuries. May there not be remnants here of some lingering attachment to animistic beliefs?

Pisé, mud bricks, or else a combination of the two techniques, with the first used at the base of the walls and the second on the upper sections, as well as in interior partition walls and staircases, characterise the tectonics of the *ksour*. Timber is used for columns which, together with the four mud square-based piers, contribute to the support of the courtyards roof, as well as for the lintels of doors and windows and the beams of floors and ceilings,

made using a technique involving the pouring of layers of mud on a frame that is the result of a skilled weaving together of palm fronds and rushes.

The presence of a spring or a well, the particular orographic and topographic conditions of a place, the proximity to a track, even symbolic or sacred reasons were fundamental when choosing a site. But perhaps the most interesting aspect of the relationship between these villages and the land was the fact that when one of them had exhausted its dwelling possibilities, or was impossible to repair, it was simply abandoned and a new one was built elsewhere. As in a rigorous mathematical field, every single plot of land was determined with great precision and all the inhabitants were obliged to respect the street line and the party walls. The building process involved specialists who operated following a project[8] for the future dwelling. The most delicate and significant phase was the so-called *louh*: the laying of a module (approximately 1 meter high) of the walls in mud, after the preparation of the respective formwork. It is precisely the horizontal lines of the mud courses which aesthetically characterise the surface of the walls, together with the shades of ochre, a certain imperfection in the straight lines and the rare shadows from the openings or the putlog holes.

The surveys and studies carried out by the Dutch Kasba 64 Study Group, collected in the book *Living on the Edges of the Sahara; A Study of Traditional Forms of Habitation and Types of Settlement in Morocco* (1973), provide what is perhaps the main documentary support to the observations by Curtis who, thanks to them, manages to distil the form and layout of the typical *ksar* and of its basic unity, the *dār*. The description of the latter in terms of its *dispositio* and of its simple furnishing, the building techniques used for its construction, the features and dimensions of the *ksar*-type, its placement among the Saharan settlement forms following Cabot Briggs' classification, the archaic and mystical atmosphere that is felt in the midst of its dusty alleys, the geographical, political and social *milieu* that is the backdrop on which it originated and evolved, including the relationship between nomad and sedentary communities, particularly delicate in this threshold region between the desert and the mountain, are all elements that Curtis derives from that invaluable publication.

Only the question of the origins of the *ksar*, complex and fascinating as a result of its condition as a village/settlement that is constantly being re-built, precisely due to the (relatively) brief duration of its constituting material, mud, seems to introduce some novel elements.

The Kasba 64 Group, after refuting the hypothesis of a Sudanese origin of the *ksour*, as well as that of its direct derivation from cities founded by the Romans, as suggested by Terrasse and Laoust based upon some evident similitudes with the said settlements, and that of an

[8] The term "project" is understood here as a future projection of the building under construction.

evolution of autochthonous forms, particularly some mountain architectures (*kelaa*) which underwent a process of progressive regularisation, seems to share Gautier's idea of an Arab origin. The *trait d'union* between the Omayyadi castles in Syria, specifically the Qaṣr al-Ḥayr al-Sharqī, and Moroccan villages, is to be found in the *ribat*, or fortified monasteries present throughout the Maghreb during the 8th and 9th centuries: the form of the *ksar* would in fact be the result of the coming together of the *ribat* and the *kelaa*. Yet perhaps the true outcome achieved is the identification of a very ancient Mediterranean type to which the *dār* of the oasis settlements at the foot of the Atlas (definitively?) belongs:

> […] we are not concerned with an exclusively Roman type, but rather with a 'Mediterranean type'. The similarity of *ksar* house, medina house, Roman house, but also the town house in Spain, Greece and other Mediterranean countries points to an old housing tradition, in which the patio house formed the basis. Old settlements in countries such as Egypt, Babylonia, Assyria and Phoenicia indicate that the prototype of the patio house is very old and dominated large parts of the Mediterranean area (Kasba 64 Group, 1973, p. 137).

As for Curtis, he brings together all the previous hypotheses in an imaginary discussion between a functionalist, who affirms the rationale of a single form that evolved autonomously through a process of trial and error and without exterior influences, and a typologist, convinced instead that every formal composition necessarily derives from other forms, concluding that no definitive assertion regarding the genesis of the *ksar* is possible: one can only imagine a history of migrations and contaminations of distant types, so remote and archetypal that they become universal and transcultural, a general order that is verified locally, on the landscape and the materials.

It is precisely these considerations regarding the genealogy of settlements which clarifies the essential difference in the aims of both texts: whereas *Living on the Edges of the Sahara* is a spatio-temporal journey into the Moroccan dwelling tradition, from the tent to the tent *douar*, to the *dār* and the medina[9], Curtis' article offers a contribution on the theme of type through a focus on a specific case study: the *ksar* and its variations. Only in this way can the fundamental likeness between the description in the book and in the essay be explained. Curtis does not intend to offer new elements to the morphological/constructive definition of the earthen villages, but rather to insert this already given definition within a wider discourse. And in order to do this he uses the material available to

[9] The settlement types described in the book *Living on the Edges of the Sahara; A Study of Traditional Forms of Habitation and Types of Settlement in Morocco* are: the tent and the tent *douar*, the *nouala* and the *nouala douar*, the *taddart* and the *igerm*, the grotto and the mountain village, the *agadir* and the *kelaa*, the *ksar* house and the *ksar*, the *tighremt* and the *kasba*, the *dār* and the medina.

him, thus producing a new synthesis that translates also into the production of three drawings which summarise the essential features of the *ksar*, the *kelaa* and the *tighremt*.
The purely architectural perspective, instead, is an element common to both essays, setting them apart from the majority of previous studies (Adam Caillé, Gallotti, Jacques-Meunié, Laoust, Montagne, Terrasse, and others), which mostly expressed sociological, ethnographic and linguistic points of view: in this sense the contribution of Kasba 64 Group constitutes the first truly complete documentation of the dwellings and of the buildings, as well as of the way in which settlements, villages and cities operate.

Architecture as active testimony, tradition as lesson

The intrinsic characteristics of the material used for the construction of the *ksour* are at the base of their cyclical abandonment, in a continuous rebirth from the earth, as well as of the relatively recent dating of the examples that have reached our days.
This fragility does not present a problem as long as the building and typological tradition continues to fuel the "life of forms", always different in their eternal identity to some types which we can define as original.
Something, however, has been interrupted in this efficient and virtuous mechanism, 'sustainable', as we would say today, as a result of the epochal transformations which have affected Moroccan society, or rather societies, over the past two centuries. The loss of the perimeter walls marks a point of no return regarding the evolution of the *ksar* type, which perhaps signals the possibility of an 'end'.
In view of all of this, what can be done?
Should we attempt to preserve this world of architectures/villages which seems almost ephemeral when compared to the long-time of history?
Or should we accept their present condition, as well as their future, which in some respects seems to be sealed?
Can their value (economic/tourism-related) coincide with their mere presence?
Is it a material heritage that must be preserved, or rather an intangible heritage of knowledge and know-how?
Herein arises an extremely delicate question concerning the meaning, even before the use, of these constructions, regarding which the studies by Henri Terrasse, the Kasba 64 Study Group and William J. R. Curtis, as well as their reflections at different moments in the history of the country, their drawings and surveys, that is the entire iconographic apparatus, are

almost the basis for a "potential project"[10] which, through knowledge, can offer an alternative to current trends.

Salima Naji, in her preface to the new edition of the book *Kasbas berbères de l'Atlas et des oasis* (2010) recalls, in case it were necessary, the fundamental role played by Terrasse in the definition of a state of the art regarding the architectures of the mountains and oases of this area of Morocco during the years of the French Protectorate, but especially in a progressive identification of a preservation and valorisation strategy which ultimately resulted in the inclusion of the *ksar* of the Aït Ben Haddou, located along the banks of the Ouarzazate river, in UNESCO's World Heritage List (1987).

There is still, however, much to be done:

> Malgré ce beau travail et ce cycle de reconnaissances entamé par Henri Terrasse et ses Amis – Naji concludes –, malgré l'effort conservateur des années 1950, malgré le fait que ces kasbahs ornées constituent très tôt la marque de fabrique de ces territoires et l'imagerie touristique du Maroc, ces hauts lieux de la culture rurale traditionnelle, uniques au monde, furent abandonnés pendant des années au point qu'on les croit définitivement perdus.

The increasing presence of mass tourism can certainly contribute to the recovery of these earthen settlements, associated in the collective imaginary to an archaic, primitive and authentic dimension. Yet it is precisely the crucial passage from decades of abandonment to a renovated condition, completely alien to their history and forms, that requires a shared commitment to safeguard their role as an active testimony. It is not a coincidence that in these pages the inquiry concerning typology became intertwined with a research on the lives of the people, on their things, their work, and their recent discovery of 'modernity'.

The testimony of the young Moroccan architect and sociologist regarding the experience surrounding the *Ksar* of Assa is paradigmatic due to the fundamental choice of creating, at the moment of its restoration, the opportunity for an integrated local development that corresponds both to the local culture and the needs of the inhabitants. Founded in the 12th century on a rocky spur over an oasis and abandoned in the eighth decade of the 20th century, this *ksar* was subjected in the recent past to interventions that were not respectful of the historical essence of its architectures. This included the razing to the ground of three of its mosques, which were replaced with buildings in reinforced concrete. With a true participation of the community, the worksite became a place for the re-discovery and transmission of knowledge and know-how – the elderly were given the

[10] Similarly, Aldo Rossi, Edoardo Consolascio and Max Bosshard defined the material collected in the book *La costruzione del territorio nel Cantone Ticino* as a "potential project (…) without which it is not possible to progress, not only in terms of territorial dynamics, but also of a simple safeguarding".

task to re-construct the ruins from the past using memory as their tool, while the young offered qualified labour – but especially a collective moment of social mobilisation involving the heritage and its preservation. A museum-oriented dimension of the spaces was naturally con-fused with tourism hospitality and other economic activities considered as necessary for the use and enjoyment of the village by all.

Today, although it is difficult, albeit desirable, to return to the use of mud, often wrongly considered as a poor material, the lesson that these architectures and settlements are capable of transmitting remains unaltered and very much valid: their capacity to become universal from the specific conditions in which they originated and developed. The eternal relationship between type and place, therefore, which permits transcending regional and cultural differences so as to come to terms with the deepest layers of architecture, with its essence, through a rigorous process of abstraction.

Although the *ksar* may return to the mud from which it came – as in Lafond's eloquent photograph – the prodigious intellectual and symbolic structures that informed it may possibly live on, but in an utterly transformed state (Curtis, 1983, p. 207).

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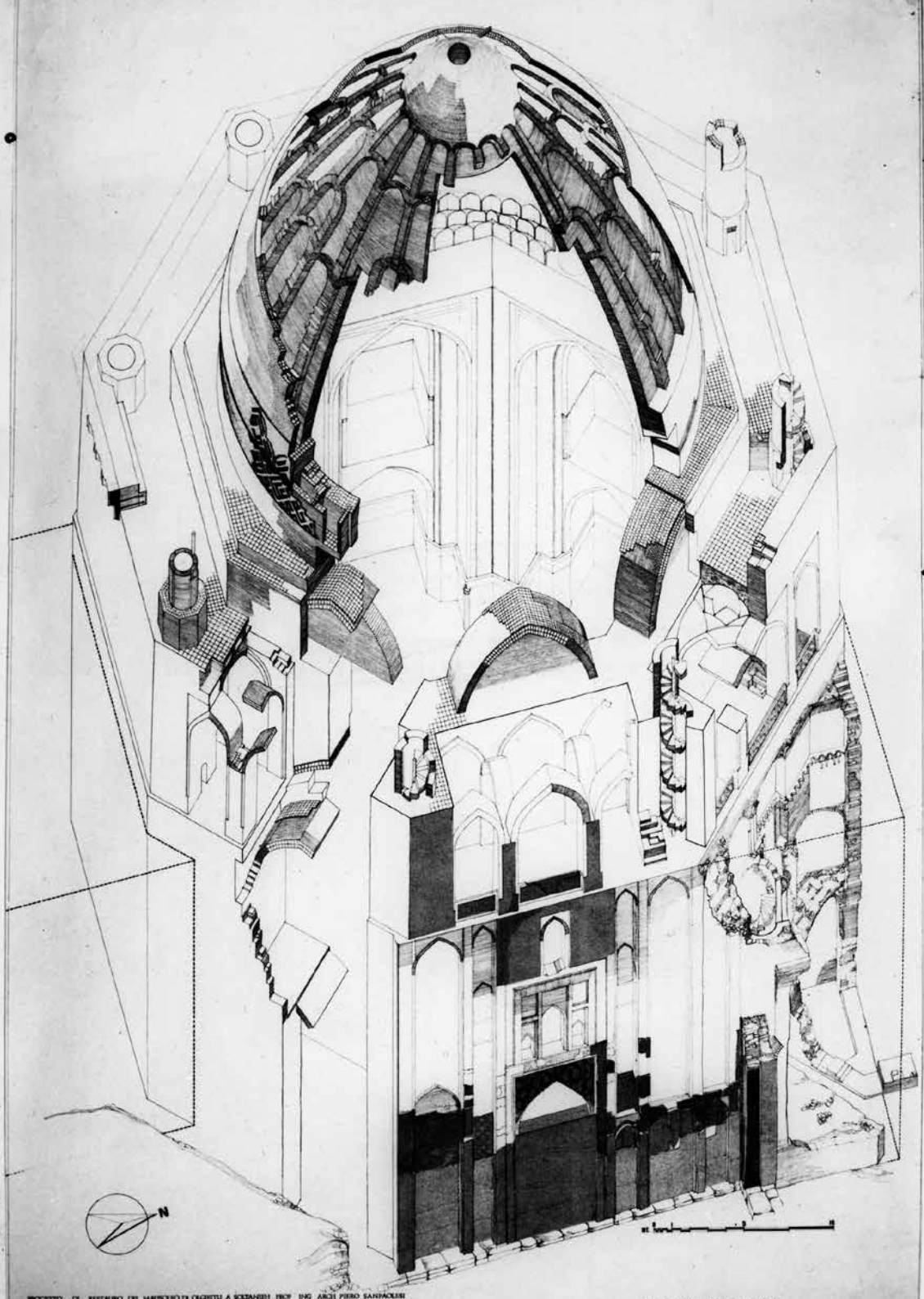
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L'activité de restauration de Piero Sanpaolesi au Moyen-Orient, quelques exemples pour mieux comprendre et protéger l'architecture méditerranéenne.

Axonométrie du Mausolée d'Oljeitu 1971 (UNIFI-AFR 430-18).

Francesco Pisani
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Restoring, consolidating, preserving, and enhancing the architecture of the urban areas in the internal areas or urban districts, can activate cultural tourism and reduce the phenomenon of depopulation. Good practices are reached through the careful study and good preparation of operators and making known what has been done in the past is certainly useful for this purpose. In this short paper we wish to illustrate the restoration works conducted in the Middle East by Piero Sanpaolesi, in Iran particularly, where he both used to give lectures on the restoration of monuments at the University of Tehran and work as a restorer on imported monuments in the country from 1965 onwards. We will focus on the works carried forward on the Mausoleum of Oljeitu, built during the Mongol domination in the center of the small village of Soltanieh, the Friday Mosque in Qazvin, a monumental complex located in the lower part of the city, and finally on the Friday Mosque in Saveh. The Persian and Mediterranean architectures are intricately linked, as a cultural exchange due to the commercial relationships and contact with the Byzantine culture. Therefore, investigating the architecture of the Near East can help us put in place appropriate conservation strategies, which from buildings can be extended to urban centers or part of them.

Mots clefs : Soltaniyeh, Qazvin, Saveh, Sanpaolesi, Restauration

Afin d'inverser la tendance à l'abandon des villes dans les arrière-pays ou dans certains quartiers urbains, le tourisme peut jouer un rôle fondamental dans la protection et la valorisation de tels sites. Au cours des dernières années, le potentiel touristique a aussi été largement débattu au niveau international. L'UNESCO a fortement misé sur le « tourisme culturel »[1] à travers différentes initiatives qu'elle a promues en collaboration avec l'ICOMOS[2]. Les diverses études et conférences ont mis en évidence la nécessité d'une approche intégrée du tourisme[3] et de la conservation du patrimoine culturel, ainsi que la relation étroite existant entre le développement du tourisme, la croissance économique et la conservation du

[1] La littérature sur le tourisme culturel est très riche et complexe, pour une vue d'ensemble sur le sujet, voir (Dal Pozzolo 2018).
[2] Toutes ces activités s'inspirent de la Charte du Tourisme Culturel, rédigée au Mexique en octobre 1999 par le Comité International du Tourisme Culturel de l'ICOMOS. Cette charte contient une série de principes novateurs pour la mise en valeur et la gestion des sites culturels.
[3] À cet effet, on souligne le passage d'un "tourisme culturel" destiné à l'utilisation du complexe à un "tourisme patrimonial" centré sur sa dimension immatérielle, cf. (Dal Pozzolo 2018 ; Sau A. 2020).

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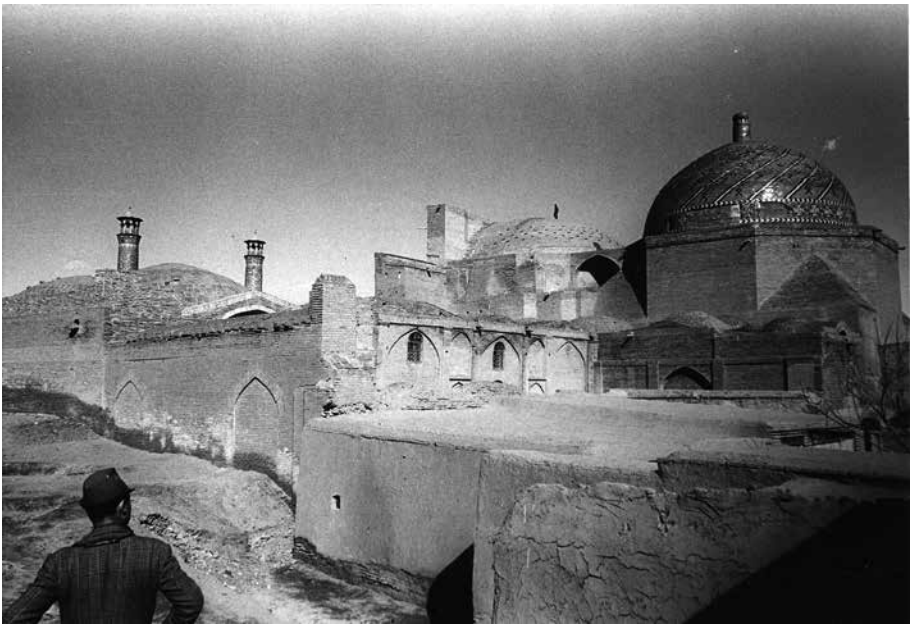
Le Mausolée d'Oljeitu pendant les restaurations en 1973, Iran (Claudio Battistini).

Vue sud-ouest de la mosquée du Vendredi de Qazvin, Iran (UNIFI-AFR 530-13).

patrimoine. L'objectif principal étant de promouvoir un tourisme culturel qui protège, conserve et interprète[4] le patrimoine, celui-ci devenant alors une opportunité notable pour le territoire en termes d'image et de visibilité. Il se crée un cercle vertueux qui est en mesure de stopper et d'inverser le dépeuplement et l'abandon des centres habités: les services requis par cette forme de tourisme prévoient l'utilisation d'une vaste gamme de professions, qualifiées également, qui deviennent un nouveau soutien économique pour les populations déjà installées en mesure même d'en attirer de nouvelles. Le tourisme culturel prévoit notamment la protection et la valorisation du patrimoine immobilier et paysager, et unit ces ressources économiques aux sites. Pour être bien comprise, cette opportunité nécessite la mise en œuvre de mesures adaptées afin de maintenir le site en bon état en vue d'améliorer les conditions d'une utilisation adéquate dans le temps.

Dans ce contexte, la restauration architecturale du patrimoine bâti peut apporter une contribution significative, puisque tous les travaux menés sur les biens et visant à leur intégrité matérielle, à leur remise en état, à la protection et à la transmission de leurs valeurs culturelles, entrent dans son champ d'intervention. En ce qui concerne la discipline de

[4] Pour les aspects théoriques critiques sur la patrimonialisation, cf. (Caccia S., Olmo C. 2015).



la restauration, la connaissance de ce qui a déjà été fait par le passé est utile pour en tirer des leçons et s'en inspirer. A cette fin, certaines des expériences de restauration au Moyen-Orient menées dans les années 1970 par Piero Sanpaolesi seront illustrées ci-dessous.

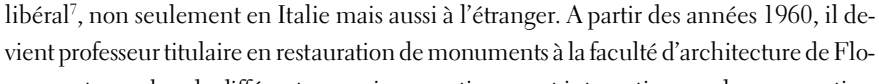
À la suite de la récente donation d'archives des héritiers du professeur Piero Sanpaolesi au département d'architecture de l'Université de Florence (Caccia Gherardini 2019), il a été possible d'entamer une série d'études pour approfondir ses recherches et travaux.

Piero Sanpaolesi est « parmi les protagonistes de la fervente saison de révision critique des lignes directrices pour la protection et la restauration du patrimoine monumental qui a culminé avec le congrès de Venise en 1964, et, l'année suivante, avec la naissance de l'ICOMOS» (Cruciani 2012, p. 443). Sa vaste activité de recherche et de travail va de la restauration à la conservation des édifices monumentaux[5], à l'étude et à la conservation des œuvres d'art[6], réalisées aussi bien dans les Surintendances de la Toscane qu'en tant que professionnel

[5] Il convient de rappeler que Piero Sanpaolesi fut actif dès la seconde moitié des années 1930, d'abord comme fonctionnaire de la Surintendance à Florence puis comme Surintendant à Pise, où il eut l'occasion de diriger divers projets de restauration de bâtiments monumentaux (Certosa del Galluzzo, Sacrestia Vecchia di San Lorenzo, Palazzo Bartolomeo Scala, etc.) ainsi que de faire progresser des travaux de réparation des dommages de guerre sur des monuments et des centres urbains sous sa direction (Pise, Camposanto monumentale, les Lungarni; Livorno, San Miniato al Tedesco, Massa, etc.).

[6] A partir de 1932, il commence à effectuer des recherches et des travaux de restauration sur des peintures au sein du

Vue nord-est de la mosquée du Vendredi de Saveh (UNIFI-AFR 530-24).



Les petits dômes de la mosquée de Qazvin pendant le chantier, Iran (UNIFI-AFR 1113-5).

libéral[7], non seulement en Italie mais aussi à l'étranger. A partir des années 1960, il devient professeur titulaire en restauration de monuments à la faculté d'architecture de Florence, et membre de différents organismes nationaux et internationaux de conservation tels que l'ICOMOS et l'UNESCO. Enfin il convient de rappeler que Piero Sanpaolesi a mis en œuvre une divulgation scientifique remarquable de ses travaux, nous laissant une large bibliographie à ce sujet (Pisani 2019).

La littérature sur l'œuvre de Piero Sanpaolesi ne mentionne que de façon marginale les restaurations réalisées au Moyen-Orient (Zangheri 2012; Spinosa 2011; Roselli 1994; Gurrieri 1981) depuis la seconde moitié des années 1960 jusqu'à la fin des années 1970. Sanpaolesi entretenait des relations particulièrement étroites avec l'Iran: il dirigea, en fait, durant cette période, l'Institut de restauration des monuments de l'Université de

Laboratoire des Offices à Florence. Par la suite, il sera également responsable de l'organisation d'expositions (Exposition d'Art Italien au Petit Palais à Paris, Exposition des Arts Sacrés à Lucques et à Pise, Exposition des Cigoli à San Miniato, etc.) et de présentations dans les musées (Complesso di San Matteo à Pise, Galleria Sabauda à Turin, Pinacoteca del Palazzo Ducale et Villa Guinigi à Lucques, etc.)

[7] Il convient de rappeler les travaux de restauration effectués sur des monuments tels que : Palazzo Bartolini Salimbeni à Florence, l'Arc d'Alfonse d'Aragon à Naples, la Loggia et le Palais Rucellai à Florence, Saint Michel à Pavie.

Téhéran[8], institution semblable à celle de la faculté d'architecture de Florence dont il fut le fondateur et directeur.

L'Organisation nationale pour la conservation des monuments archéologiques d'Iran lui confit différentes missions visant à la restauration de certains monuments iraniens d'importance. Nous décrirons ci-dessous les travaux effectués sur le mausolée Soltaniyeh[9], la mosquée du Vendredi de Qazvin[10] et la mosquée du Vendredi de Sāveh[11].

En novembre 1967, Piero Sanpaolesi est chargé de mener une étude pour la restauration du mausolée Soltaniyeh[12], et en septembre 1969, il occupe la fonction de concepteur et

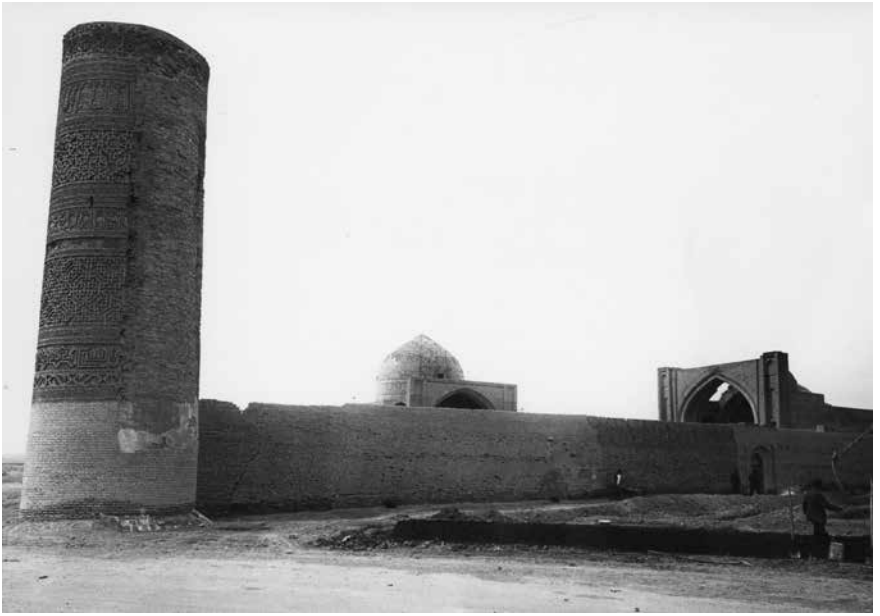
[8] L'Institut de Restauration des Monuments de l'Université Nationale de Téhéran a été fondé en 1967 comme école de spécialisation de deux ans dans la restauration des monuments. Les relations entre le monde académique italien et iranien ont été favorisées par l'intercession du professeur Giuseppe Tucci, président de l'Institut Italien pour le Moyen et Extrême-Orient (I.S.M.E.O). Voir Archives Privées Piero Sanpaolesi (récemment APPS), *Restauri Iran 4*, lettres.

[9] Le mausolée d'Öljeitü se trouve dans la petite ville de Soltaniyeh, dans la province de Zanjān, érigé entre 1302 et 1312, et est coiffé d'une troisième coupole à double coque en maçonnerie, la plus grande au monde sous l'ère médiévale.

[10] La mosquée Jammeh de Qazvin est l'une des plus anciennes mosquées d'Iran, construite par le calife abbasside Haroun al-Rashid en 807 sur les structures d'un ancien temple sassanide. Le bâtiment est parvenu jusqu'à nous après plusieurs agrandissements et travaux de restauration successifs au cours des siècles. Les travaux relatifs à la période seldjoukide d'abord puis à celle safavide, sont les plus marquants.

[11] La mosquée Jammeh de Sāveh a été construite au XII[ème] siècle. Comme beaucoup d'autres bâtiments anciens, elle a également subi plusieurs remaniements et restaurations au cours des siècles. Les analyses formelles conduites par Sanpaolesi ont mis en évidence neuf corps de construction aux caractéristiques propres.

[12] Cf. APPS, *Restauri Iran 1*, *Soltanieh 2*, lettre du 19 novembre 1967.



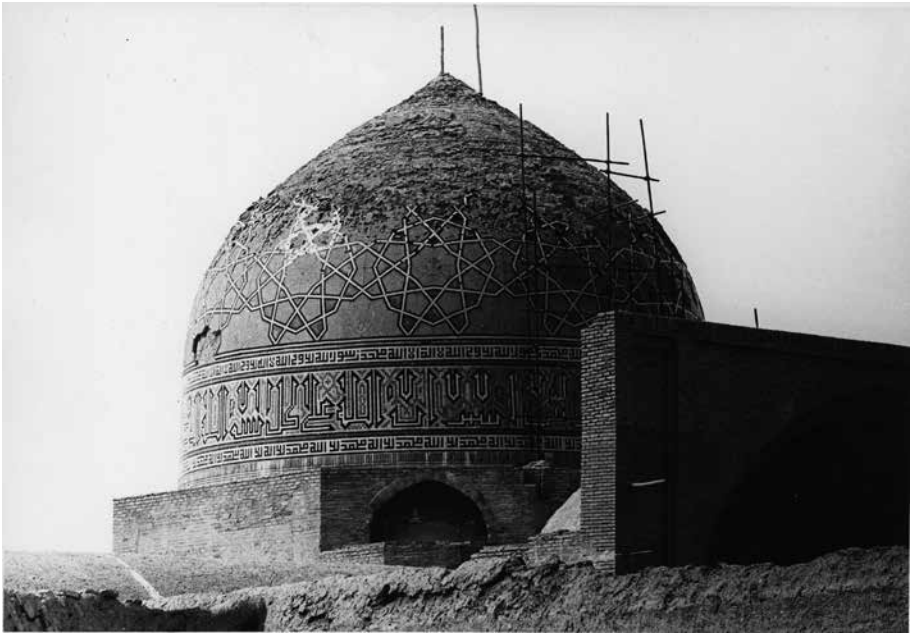
L'ivan occidental de la mosquée de Saveh avant les restaurations (UNIFI-AFR 943-7).

L'ivan occidental de la mosquée de Saveh avant les restaurations (UNIFI-AFR 943-7).

conducteur des travaux. Parmi les premières actions engagées figure la mise en œuvre d'une série de travaux provisoires afin de garantir la mise en sécurité de l'ouvrage ; travaux très utiles, par ailleurs, pour les opérations d'analyse et de vérifications préliminaires parmi lesquelles le montage des échafaudages[13]. Il procède, en outre, à une série d'essais dans le sol pour vérifier la forme et la solidité des fondations[14]. Les principaux contrôles, cependant, sont effectués sur la maçonnerie, étudiés à travers l'identification des matériaux utilisés et la vérification du comportement statique de l'édifice.

En 1971, un projet de restauration fut élaboré puis rassemblé en deux volumes reliés[15]. L'édifice semble présenter un risque notable d'instabilité, une importante dégradation des formes architecturales et une altération sévère de ses éléments décoratifs. Pour les fondations situées à une profondeur de 50 à 60 cm et composées d'un coulage de pierres d'un diamètre de 20 à 25 cm et de mortier de plâtre et de chaux, ne trouvant pas de tassements importants, Sanpaolesi prévoit de faire des lavages pour éliminer la chaux désagrégée et de pratiquer des injections à basse pression de mortier de ciment (Sanpaolesi

[13] Cf. APPS, *Restauri Iran 1*, *Soltanieh* 2, lettre du 27 septembre 1969.
[14] Cf. APPS, *Restauri Iran 1*, *Soltanieh* 2, lettre du 16 novembre 1969.
[15] Une copie de ces volumes est aujourd'hui conservée aussi bien dans les archives privées de Florence que dans les archives de l'Université Shahid Beheshti (SBU) de Téhéran, cf. (Sanpaolesi 1971).



1971, p. 8). L'examen de la maçonnerie au moyen de carottages permet de définir la consistance des équipements et des matériaux[16] employés. Les trouvant adéquats, seules des interventions de réarrangement local sont envisagées en fonction des besoins (Sanpaolesi 1971, p. 10). Les recherches de Piero Sanpaolesi se concentrent surtout sur la coupole qui, analysée tant dans sa géométrie[17] que dans sa conformation structurelle, est interprétée dans tous ses aspects. «La coupole présente une structure très originale composée d'une calotte porteuse interne et d'un dôme porteur externe qui, à son tour, supporte le *casci*[18] de protection. Entre les deux dômes, un espace d'environ 60 cm est occupé par une série de nervures ingénieusement disposées» (Sanpaolesi 1971, pp. 14-15)[19]. La lecture des dégradations et altérations affectant l'édifice permet d'en comprendre les origines, à savoir : le manque d'entretien, les actions sismiques, les actions de poussée (du dôme, des arcs et des voûtes) et les variations thermiques. Certaines hypothèses d'intervention sont formulées pour que la restauration

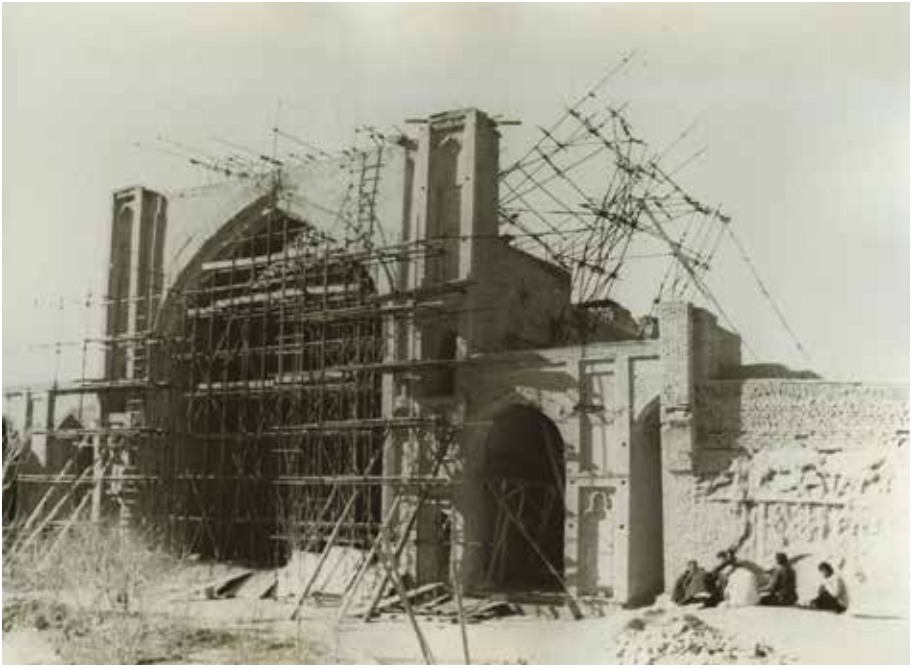
[16] La maçonnerie est composée de briques cuites et de lits de mortier de gypse sur toute son épaisseur. Voir (Sanpaolesi 1971, p. 6).
[17] Les mesures sont de 25,5 m de diamètre à l'imposte et de 47 m de hauteur à l'œil central.
[18] C'est ainsi que Sanpaolesi écrit en italien le mot persan Kashi qui signifie carreau. Ce terme persan dérive du nom de la ville de Kāshān.
[19] La traduction en français est l'œuvre de l'auteur.

L'ivan occidental de la mosquée de Saveh pendant les travaux (APPS s.n.).

Mausolée d'Oljeitu 2011, Iran, (Ramin shirsavar, CCBY3.0, https://commons.wikimedia.org/w/index.php?curid=53617608).

statique soit précédée par la restauration effective des surfaces décorées. La construction d'un anneau de béton armé à la base du dôme est envisagée pour contenir la poussée horizontale, la restauration des arcs et des voûtes, et enfin la réparation des lésions avec des interventions localisées, ayant l'objectif de rétablir les conditions de résistance des structures[20]. Les archives privées conservent également une série de rapports[21] dont on découvre que les choix d'intervention du scientifique l'ont conduit à évaluer la nécessité de sélectionner et de former des artisans, afin que la partie opérationnelle soit réalisée en parfaite conformité avec les indications du projet. Il apparait donc que «le recrutement des travailleurs et leur formation» constitue l'une des tâches «essentielle pour commencer tout travail »[22]. Il ressort également que la pensée de Sanpaolesi ne se limitait pas au seul monument, mais s'étendait à son contexte et à ses aspects socio-anthropologiques[23], mais surtout aux questions liées à la mise en valeur du site et à son accessibilité. Le chercheur se soucie en effet de créer des places et des zones de stationnement (Sanpaolesi

[20] Cf. APPS, *Restauri Iran 1, Soltanieh* 2, prévision des travaux.
[21] Cf. APPS, *Restauri Iran 1, Soltanieh* 2, I rapport d'information; APPS, *Restauri Iran 1, Soltanieh* 2, Le compte-rendu; APPS, *Restauri Iran 1, Soltanieh* 2, rapport.
[22] «Cette tâche fut remarquablement accomplie par l'architecte D'Errico qui, en tant que responsable du site, réside à Soltanieh», voir APPS, *Restauri Iran* 1, Soltanieh 2, rapport.
[23] APPS, *Restauri Iran 1, Soltanieh* 2, Lavori a Soltanieh, 10 giugno 1976.



1971, pp. 85-86), et d'anticiper la muséalisation des découvertes archéologiques effectuées lors des fouilles (Sanpaolesi 1971, pp. 113-114).

Pour la mosquée du Vendredi de Qazvin et celle de Sāveh, Sanpaolesi met en place une opération similaire à celle utilisée pour Soltaniyeh, menée presque simultanément sur les deux sites[24] où une première phase du chantier est consacrée à la mise en sécurité des structures et à l'approfondissement de la connaissance de l'ouvrage. Les deux mosquées ont été inspectées et les dessins ont été rassemblés de manière organique dans des albums reliés[25]. Des fouilles ont également été menées dans ces ouvrages à la fois pour une investigation archéologique à la recherche des structures préexistantes et du plan d'origine, et pour comprendre les fondations et leur état relatif d'efficacité. En particulier, à Qazvin, on a voulu étudier le système des deux *quanat*[26] qui traversent le complexe. Sanpaolesi attribue le mauvais état

[24] Les travaux de restauration commencent à Qazvin en 1973; les études préliminaires commencent à Sāveh en 1974.
[25] Voir APPS, Iran 2 *Restauri*, Qazvin, 2 Tables Qazvin, 2 Tables; APPS, Iran 2 *Restauri*, Sāveh, 2 Tables Sāveh, Tables.
[26] Les qanâts sont un système de transport d'eau utilisé pour l'approvisionnement en eau dans les milieux chauds et arides. La technologie sur laquelle ils sont basé a d'abord été développée dans l'ancienne Perse et s'est étendue à d'autres cultures.

Le village de Soltaniyeh vu de la loggia du Mausolée d'Oljeitu 2019, Iran (Di Mardetanha - Œuvre propre, CC BY-SA 4.0, https://commons.wikimedia.org/w/index.php?curid=84568558).

du bâtiment à la négligence, mais surtout à l'humidité qui imprègne le sol et les murs, provenant des canaux précités, du mauvais écoulement des eaux pluviales et de l'élévation du niveau du sol sur le périmètre extérieur du complexe qui est en contact avec le bâtiment. Afin d'éliminer la détérioration «due à l'eau» sur tout le côté ouest, une gouttière est construite pour éloigner à la fois l'humidité du sol et l'eau de pluie collectée des toits et acheminée au-delà des avant-toits du bâtiment par des gargouilles[27]. De plus, les extrados de l'ensemble des petits dômes, qui forment le système de toiture, sont imperméabilisés avec une couche de mortier bitumineux, doublés de toile de jute à laquelle est superposée une autre couche de mortier bitumineux[28]; procédure mise en œuvre également pour Sāveh[29].

En raison de la désagrégation des joints de mortier due aux infiltrations d'eau, les structures murales de Qazvin présentaient des lésions et des déformations qui ont été résolues par un système de clouage, de coulage de béton et de réintégration. Les actions de

[27] Cf. APPS, *Restauri Iran 2*, *Qazvin*, *1* Qazvin *rapporti*, Situazione generale s.d.
[28] Cf. APPS, *Restauri Iran 2*, *Qazvin*, *1* Qazvin Qazvin *rapporti*, I rapporto s.d.
[29] Cf. APPS, *Restauri Iran 2*, *Sāveh*, *1 Sāveh* Qazvin *rapporti*, Relazione 1 1975.

poussée du grand dôme et de la salle de prière derrière l'iwan du sud sont absorbées par l'introduction d'un cerclage au niveau du volet des arcs soutenant le dôme lui-même (Nizzi Griffi, 2012)[30].

A la suite d'investigations cognitives, la maçonnerie du complexe de Sāveh s'est révélée hétérogène dans certaines parties en briques d'argile crue, d'en d'autres en briques cuites, et enfin avec un noyau d'argile et un revêtement de briques cuites, mais globalement encore efficace. Il a suffi de consolider uniquement les piliers de la salle du dôme derrière l'iwan sud et de réparer les lésions (Pietramellara 1981) avec la technique du *cuci-scuci*[31]. C'est dans l'iwan occidental que Sanpaolesi envisage d'importants travaux de consolidation des arcs transversaux, avec l'insertion extradossale de consoles de soutien en béton armé (Nizzi Griffi, 2012) et la reconstruction des voûtes de l'iwan lui-même. Des travaux de sous-fondation ont été réalisé dans les deux mosquées[32] mais ce n'est qu'à Qazvin, sous la direction de Piero Sanpaolesi, que les travaux de restauration des décorations intérieures ont commencé.

Avec la révolution islamique iranienne, Sanpaolesi rompt ses relations avec l'Iran comme en témoigne sa dernière correspondance remontant à 1978. Le travail du chercheur ne s'est cependant pas interrompu car les architectes iraniens, alors formés à l'Institut de restauration des monuments de Téhéran, ont pris le relais et ont poursuivi l'œuvre de conservation du monument, malgré mille difficultés et retards, au point de faire inscrire le mausolée Oljeitu de Soltaniyeh sur la Liste du patrimoine de l'humanité de l'UNESCO lors de la 29ème réunion du Comité du patrimoine mondial en juillet 2005 à Durban [33]. Les travaux de restauration progressent également au sein des mosquées de Qazvin et Sāveh, où certaines salles sont aménagées en musée afin de pouvoir exposer les différentes découvertes archéologiques faites lors des travaux de restauration. Les travaux entrepris par Sanpaolesi ont permis, outre la sécurisation de ces monuments pour les générations futures, de mettre en valeur les «environs». Le village de Soltaniyeh, par exemple, a trouvé dans le site de l'UNESCO un soutien au renouvellement et à la croissance de ses édifices, et une source de subsistance économique à travers l'emploi de ses habitants dans les services directes et indirectes requis par le «tourisme culturel». Même les quartiers où s'élèvent les mosquées du Vendredi de Quazvin et de Saveh ont bénéficié des travaux de restauration, lesquels ont été requalifiés aussi bien

[30] Cf. APPS, *Restauri Iran 2*, *Saveh*, *1 Saveh rapporti*, Rapporto 1977.
[31] La technique «*cuci-scuci*» est un type d'intervention traditionnelle qui consiste à rétablir la continuité de la maçonnerie en enlevant les éléments de pierre ou de brique endommagés, et en créant une nouvelle texture de maçonnerie avec de nouveaux éléments, mais sans rompre la fonction statique de la maçonnerie au cours même de l'application.
[32] Cf. APPS, *Restauri Iran 2*, *Qazvin*, *1 Qazvin raporti*, rapporto 1977; APPS, *Restauri Iran 2*, *Saveh , 1 Saveh rapporti*,, programme des travaux pour l'année1978.
[33] Il existe toute une série de rapports sur la restauration qui sont conservés au sein de la faculté d'architecture de l'Université de Shahid Beheshti (anciennement Dāneshgāh-e Melli).

pendant les travaux, afin de mieux préserver et mettre en valeur les monuments, que par la suite, afin de répondre aux besoins requis par l'augmentation de la fréquence touristique. Nous pouvons affirmer que ces exemples du Moyen-Orient sont des expériences positives au sein desquelles les bonnes pratiques de restauration alliées au «tourisme culturel» ont permis de contraster le phénomène du dépeuplement.

Ce rapide tour d'horizon nous rappelle que la restauration est avant tout un acte de connaissance critique, où le monument est le premier document de lui-même qu'il faut lire à la lumière d'une préparation solide et exhaustive. La connaissance des travaux de restauration réalisés en Perse par Piero Sanpaolesi, outre à servir d'exemple, peuvent être utiles pour la récupération du patrimoine bâti méditerranéen. L'architecture de ces deux contrées, bien que très éloignées l'une de l'autre, est étroitement liée, en raison des échanges culturels associés aux relations commerciales, et au contact avec la culture byzantine, ayant permis de faire circuler des connaissances techniques qui ont porté à la construction de monuments très semblables tant au Proche-Orient que dans les régions bordant la Méditerranée (Galdieri 1997; Sanpaolesi 1972b).

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LES CONFLITS RELIGIEUX ET SOCIAUX COMME CAUSE DE LA TRANSFORMATION ET DE L'ABANDON RÉCENT DE CERTAINS ÉTABLISSEMENTS BYZANTINS EN ASIE MINEURE

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Demircili. Les monuments funéraires présentent des pathologies évidentes de pourriture et des signes d'instabilité statique.

Along the Mediterranean coasts of Turkey there are still traces of important urban centers now abandoned. These ruins are the result of natural events, but also political and economic changes or religious conflicts that have affected the territories of Asia Minor for centuries. The existence of traces of different cultures (pagan, Byzantine, Islamic) add information about the abandonment of these centers due to religious or social conflicts, still ongoing in the regions inhabited by Armenian and Kurds, considered by the current Republic of Turkey as marginal ethnic groups. Abandoned settlements appear as agricultural landscapes, landscapes of the spirit; they are in contrast with the new tourist centers that represent the main driving force for today's economic and political strategies. Considered as places without interest, they are often invisible because on the margin of the touristic itineraries; they are inaccessible as they are enveloped by infesting vegetation; they are not studied and therefore they are apparently non-existent. On these premise, and with reference to the sites of Korykos, Elaiussa, Kanitelleys and Akkale, the contribution will analyze the causes of the abandonments and the effects they have had on the architectural and urban heritage.
This in order to propose conservation strategies and enhancement that recognize the value of cultural testimony; moreover, the traces of the different frequentations, often coeval, can witness degrees of social tolerance that, beyond the conflicts of religion, have characterized these places for centuries.

Key-words: ruins, abandonment, Asia Minor, conflicts, conservation strategies.

Prémisse

Compte tenu des dispositions récentes du gouvernement turc, concernant notamment l'abolition de l'institution muséale de Hagia Sophia et de Saint-Sauveur-in-Chora (dont les origines chrétiennes ne seront pas mentionnées), quel avenir peut avoir le patrimoine de l'époque chrétienne (déjà fortement compromis) qui caractérise des sites archéologiques et des contextes urbains entiers désormais abandonnés? En effet, le long des côtes méditerranéennes de la Turquie actuelle il y a encore des traces, tantôt substantielles tantôt fragmentaires, de centres urbains importants de fondation byzantine aujourd'hui abandonnés. A ceux-ci s'ajoutent les signes d'établissements agricoles et productifs caractérisés par des infrastructures (routes, aqueducs, citernes) et par des architectures monumentales ou des complexes ruraux[1].

[1] Pour approfondissements voir C. Varagnoli (édité par) *Conservare il passato. Metodi ed esperienze di protezione e*

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Elaiussa Sebaste. Les ruines de la péninsule qui émergent de la couverture de sable au milieu de la végétation.

Akkale. Détail de l'effondrement primaire des structures du palais byzantin, aujourd'hui abandonné comme tout le village.

Ces ruines, souvent situées dans un paysage naturel typique du maquis méditerranéen, sont le résultat d'événements naturels, de changements climatiques et géomorphologiques, mais surtout de changements politiques et économiques ou encore de conflits religieux qui depuis des siècles affectent les territoires d'Asie Mineure. Ce sont surtout les côtes entre Silifke et Mersin qui offrent des pistes de réflexion intéressantes sur la dynamique d'abandon des établissements urbains[2]. Ici, en effet, la présence de ruines fortement endommagées ou en état d'effondrement primaire témoigne de la succession, au fil des siècles, de nombreux événements sismiques qui ont progressivement mené les habitants à abandonner ces lieux[3]. Cependant, l'existence de plusieurs cultures (païenne, byzantine, islamique) traçables à travers la lecture des œuvres architecturales, des typologies urbaines et des infrastructures agricoles, ajoute des informations sur l'abandon de ces villages, surtout en raison de conflits religieux ou sociaux, présents dans ces régions, arméniennes et kurdes, toujours considérées par l'actuelle République de Turquie comme des ethnies marginales.

Les établissements abandonnés apparaissent comme des paysages agricoles, des paysages

restauro nei siti archeologici, Gangemi Editore, Roma 2005; G. Biscontin, G. Driussi (édité par) *Conservazione e valorizzazione dei siti archeologici. Approcci scientifici e problemi di metodo*, Arcadia Ricerche, Venezia 2013.

[2] J. Freely, *The Eastern Mediterranean coast of Turkey*, SEV, Istanbul 1998, pp.181-214.

[3] E. Romeo, E. Morezzi, R. Rudiero, *Il patrimonio archeologico tra terremoti e restauri. Conservazione e valorizzazione dei paesaggi sismici*, en: S. Parrinello, D. Besana (édité par), *Contributi per la documentazione, conservazione e recupero del patrimonio architettonico e per la tutela paesaggistica*, Edifir, Firenze 2016, pp. 161-172.

de l'esprit, des paysages de l'Hadès, qui contrastent avec les nouveaux centres touristiques qui représentent le principal moteur des stratégies économiques et politiques actuelles. Considérés comme des lieux sans intérêt, en marge des itinéraires touristiques habituels, ils sont souvent invisibles et inaccessibles, car la plupart du temps ils sont couverts par la végétation adventice; de plus, ils ne font pas l'objet d'études, comme s'ils n'existaient pas.

Sur la base de ces prémisses et compte tenu des orientations culturelles récentes (par ailleurs, en conflit avec les lois actuelles en matière de protection du patrimoine architectural et environnemental de la Turquie), on examinera les sites de Korykos, Elaiussa Sebaste, Kanitelleys et Akkale, dont on analysera les causes des abandons répétés et leurs effets sur le patrimoine architectural et urbain. On proposera des stratégies de conservation (campagnes de fouilles, études appropriées, interventions de restauration) et de valorisation (diffusion des résultats des recherches archéologiques, inclusion dans les itinéraires touristiques consolidés) qui reconnaissent la juste valeur de témoignage culturel, indépendamment des idéologismes religieux et de la discrimination raciale. En effet, l'abandon séculier permet aujourd'hui d'identifier et de lire plus aisément les traces des différentes fréquentations, souvent contemporaines, qui témoignent d'une tolérance religieuse et sociale qui, au-delà des conflits idéologiques, a encore beaucoup à enseigner. Le choix d'analyser ces établissements spécifiques

Olba. L'aqueduc romain avec les signes d'instabilité des grandes pierres de taille.

découle de la volonté d'exposer des cas différents, aussi bien en ce qui concerne les phénomènes qui ont décrété l'abandon définitif des centres de Kanytelleis et d'Akkale qu'en ce qui concerne certaines politiques de valorisation actuelles (en termes de développement touristique) des contextes urbains de Korykos et d'Elaiussa Sebaste[4]. Cependant, le dénominateur commun est l'acceptation, au fil des siècles, de différentes confessions religieuses presque toutes présentes dans les traces documentaires du patrimoine existant.

Korykos. La basilique en ruines, appartenant au village qui, à l'époque byzantine et islamique, a été construit à proximité des ruines de la ville helléno-romaine.

Kanytelleis. Basilique A: le bâtiment présente des exemples intéressants de défaillance structurelle ou d'effondrements primaires encore bien conservés.

Les événements sismiques comme cause de désagrégation sociale et marginalisation territoriale

Les centres urbains les plus importants sont aujourd'hui représentés par Elaiussa Sebaste et par Korykos. Le premier centre possède des témoignages liés aux événements telluriques: fissures, effondrements primaires et situations d'équilibre extraordinaire. A ceux-ci s'ajoutent les traces qui émergent du sable, un effet clair de l'action érosive et des dépôts éoliens dus au milieu marin: un mélange d'agents perturbateurs qui se transforment d'élément négatif en outil de valorisation[5].

[4] R. Rudiero, *Strumenti per la conoscenza del patrimonio archeologico e didattica per la conservazione dei beni allo stato di rudere*, en: G. Biscontin, G. Driussi (édité par), cit. pp. 641-650.
[5] E. Romeo, E. Morezzi, R. Rudiero, *Riflessioni sulla conservazione del patrimonio archeologico*, Ermes Editore, Roma 2017, pp.147-243.

Un scénario dans lequel les événements naturels ont laissé des traces indélébiles qu'il faut aujourd'hui préserver, car les destructions sismiques peuvent devenir un moyen pour comprendre les changements du paysage. L'une des colonnes du Temple situé sur le promontoire a un aspect incroyable: l'un des tambours du fût, lors de l'effondrement, s'est couché transversalement au tambour sous-jacent, en assumant une configuration qui caractérise l'ensemble du monument[6]. La position des colonnes de la façade est également intéressante : elles reposent sur le sol en effondrement primaire. Dans ce cas, les consolidations ne sont pas nécessaires, parce que la moindre intervention nierait la valeur d'authenticité que possède la ruine, le but étant celui de conserver les traces des fréquentations multiethniques qui ont eu lieu même après les événements sismiques.

Malheureusement, à Elaiussa certaines interventions de restauration récentes ont éliminé de nombreuses traces des événements telluriques: la sécurisation d'une façade de l'Agora; la consolidation des Thermes du Port; la reconstruction d'une partie du théâtre et la libération de l'orchestre des éléments effondrés de la scène (nécessaires pour réaliser les fouilles et les études) ont partiellement démoli ou modifié le site, en marginalisant ou en transférant une partie de la population, la plus pauvre, qui, pendant des siècles, avait utilisé les ruines du monument comme matériau de construction pour des habitations modestes. Heureusement, une condition similaire (de réutilisation des bâtiments anciens) est toujours présente dans la nécropole du nord-ouest[7].

Par conséquent, bien que de nombreux documents matériels soient maintenant perdus, à Elaiussa il serait possible de concevoir un « paysage archéo-sismologique » qui engloberait

[6] E. Equini Schneider (édité par), *Elaiussa Sebaste I. Campagne di scavo 1995-1997*, L'Erma di Bretscheider , Roma 1999, p.117.
[7] E. Morezzi, *Paesaggio e necropoli tra memoria e attualità* en M. A. Giusti, E. Romeo (édité par), *Paesaggi Culturali*, Aracne Editrice, Roma 2010, pp.35-42.

Akkale. Le site archéologique avec les ruines du complexe byzantin; en arrière-plan les constructions récentes et le port touristique.

Elaiussa Sebaste. L'une des tombes à l'intérieur de la nécropole et aujourd'hui utilisée comme gisement agricole.

aussi le village voisin de Korykos, pour former la séquence spectaculaire de basiliques byzantines conservées à l'état de ruine avec des traces, encore très évidentes, des effondrements primaires des structures visibles également dans le *Château de Terre*. Ici, les techniques de maçonnerie témoignent de la grande habileté des bâtisseurs médiévaux, puisque certaines structures, non effondrées, conservent leur équilibre exclusivement grâce à l'effet de frottement et d'inertie des éléments structurels ou grâce à la cohésion des liants et des matériaux utilisés[8].

Cependant, les dégâts causés par les séismes sur les monuments sont évidents dans l'ensemble du territoire: l'effondrement du palais byzantin d'Akkale; les portions de murs en équilibre dans les basiliques proto-chrétiennes de Kanytelleis; les tombes à temple sur la route de Silifke à Olba; les arcades de l'aqueduc de la même ville. En particulier, le palais byzantin d'Akkale abrite encore l'une des pièces qui donnait sur la cour intérieure et qui s'est effondrée : après plusieurs siècles les pierres des arcs dessinent au sol la matrice géométrique et sur ces pierres il est encore possible de voir la totalité du mur de blocs

[8] R. Rudiero, *Valorizzare un paesaggio archeologico: proposte per Elaiussa Sebaste*, en E. Romeo, *Cultura e prassi della conservazione in Turchia*, Writeup Site, Roma 2020, pp. 145-176.

équarris[9], ainsi que l'escalier en colimaçon qui menait aux étages supérieurs de l'immeuble. L'équilibre exceptionnel de l'aqueduc byzantin de Korykos à Kanytelleis devrait attirer notre attention, car il affiche, outre l'instabilité, les anciennes techniques de consolidation utilisées pour préserver la structure. La dégradation de l'aqueduc romain d'Olba, où des traces d'effondrements primaires et quelques gros blocs de pierre encore en équilibre sont évidents, est elle aussi intéressante.

Les phénomènes d'instabilité des basiliques byzantines, réduites à l'état de ruine, entre la ville de Korykos et Kanytelleis sont intéressants; ici, des effondrements primaires et des exemples de déformations et de fissures sont présents. Ces derniers sont contraires à toute logique structurelle, comme la plupart des monuments funéraires situés entre Silifke et Diocaesarea: une série de bâtiments dans lesquels les sollicitations sismiques ont produit des phénomènes d'équilibre extraordinaires. Avec les tombes de la nécropole nord-ouest d'Elaiussa, ils accentuent la valeur que les vastes cimetières ont prise au cours des siècles[10]. La conservation de ces exemples apparaît nécessaire si l'on veut connaître et mettre en valeur les événements historiques qui ont touché ce territoire, y compris les catastrophes naturelles résultant de phénomènes d'abandon des lieux. Cela suppose des stratégies d'intervention sur

[9] C. Taşkıran, *Silifke and environs*, SIM, Ankara 1993, pp.119-121.
[10] E. Morezzi, *Paesaggio e necropoli tra memoria e attualità*, cit. p.40.

Elaiussa Sebaste. Détail des maisons paysannes construites, de l'époque byzantine à l'époque seldjoukide, à proximité du théâtre antique, utilisant des bâtiments funéraires romains.

Kanytelleis. Le cimetière islamique actuel près de la citerne romaine était également utilisé aux périodes byzantine et seldjoukide.

le patrimoine archéologique au moyen d'interventions minimales, dans lesquelles la possibilité de reconnaître l'ancien et le nouveau est confiée à de simples opérations de consolidation qui respectent les signes des événements telluriques et des changements anthropiques.

Cette stratégie favoriserait la naissance de nouveaux paysages avec une caractérisation spécifique: un territoire où les phénomènes naturels, sociaux, religieux et économiques donneraient lieu à un système complexe de témoignages permettant de surmonter toute sorte de division, d'opposition, de marginalisation sociale qui caractérise la Cilicie depuis des siècles.

Marginalisation sociale entre conflits religieux et multiculturalisme

Si le principal dénominateur commun réside dans les événements sismiques répétés qui ont affecté ces réalités urbaines et archéologiques, le deuxième point commun consiste à avoir accueilli, pendant des siècles, dans leurs contextes urbains, plusieurs confessions religieuses, presque toutes présentes dans les traces documentaires du patrimoine existant. En commençant par la damnatio memoriae, mise en œuvre par le christianisme contre le paganisme et l'islamisation ultérieure de l'ensemble du territoire, ces changements religieux et culturels sont aujourd'hui évidents dans les centres urbains de Kizkalesi (Korykos) et d'Ayaş (Elaiussa Sebaste). Dans le premier cas, la refonctionnalisation des monuments romains et l'utilisation de matériaux de dépouillement utilisés surtout pour la construction du Château de Terre témoignent du processus lent de démantèlement

de la société païenne au profit de la société chrétienne qui, bien qu'elle abandonne partiellement l'ancien centre urbain de l'époque romaine pour construire un nouveau centre comme symbole de la christianisation du territoire, continue d'utiliser les infrastructures anciennes et le système agraire mis en place par les Romains, en tirant des avantages économiques et sociaux[11]. En fait, le paysage agricole ne change pas, il se limite à exploiter les établissements productifs en tant que nouveaux agrégats urbains, en plaçant de nouvelles habitations même à l'intérieur de la nécropole.

Par conséquent, l'on assiste à un phénomène de mélange culturel qui unit les villes des morts païennes aux villes des vivants de la civilisation byzantine quand les tombes anciennes furent transformées en résidences, écuries, entrepôts et des vergers furent plantés parmi les monuments funéraires, le long des anciennes routes romaines.

Les terrains productifs situés entre Korykos et Elaiussa Sebaste, ainsi que la vaste nécropole d'Elaiussa, sont un exemple de réutilisation qui continue encore aujourd'hui[12]. En fait, il y a de nombreux cas dans lesquels les tombes sont encore utilisées par les communautés pay-

[11] Pour approfondissements voir E. Romeo, *Cultura e prassi della conservazione in Turchia*, Writeup Site, Roma 2020.
[12] E. Morezzi, *Necropoli e ruderi funerari in Asia Minore. Dalle esplorazioni ottocentesche alla configurazione attuale del paesaggio archeologico*, en: «Restauro Archeologico», II (2016), pp. 114-131.

sannes de religion islamique comme garnisons pour les activités agricoles.
Le résultat est un nouveau village dans lequel la continuité temporelle est l'élément dominant: l'histoire caractérise la trame des établissements actuels; les architectures, qui ont évolué au fil du temps, le nouveau tissu social; les sources graphiques, iconographiques et littéraires qui racontent ces événements, la mémoire du territoire. Ici, la désagrégation sociale et la marginalisation - la population résidente étant considérée comme un obstacle aux politiques de valorisation - sont plus que jamais présentes, bien qu'elles soient caractérisées par une vivacité dont on ne souhaite pas la disparition causée par l'abandon forcé nécessaire pour poursuivre les fouilles archéologiques et favoriser la spéculation immobilière qui affecte déjà la limite sud du site archéologique[13].
Actuellement, on perçoit partout le changement social et culturel, suivi de l'abandon, qui a donné lieu à la coexistence de basiliques chrétiennes présentes parmi les tombes païennes ou parmi les anciens sarcophages (dont plusieurs sculptés à nouveau avec des symboles chrétiens), qui ont été réutilisés pendant toute la période de la première christianisation de la Cilicie; néanmoins, la présence de tombes et de mausolées islamiques, parmi lesquels se distingue celui de Paşa Türbesi[14], est assez forte. A Elaiussa, dans le temple situé sur le promontoire, on peut voir les traces d'une basilique créée entre les colonnes de l'édifice païen, tandis que l'agora romaine transformée en cathédrale est devenue, après la conquête islamique, le lieu des échanges commerciaux, qui a donné naissance au nouveau centre urbain d'Ayaş[15].
Une continuité d'usage multiculturel (les familles kurdes et arméniennes vivent encore dans les deux centres urbains) qui peut être perçue à la fois à Kizkalesi et à Ayaş aussi pour l'intérêt touristique et la construction conséquente de structures d'hébergement qui s'inspirent le plus souvent de la culture occidentale. De nouveaux hôtels sont bâtis à proximité des zones archéologiques ou surplombent les ruines des basiliques byzantines; dans certains cas, une licence est accordée pour construire des villas privées à l'intérieur de l'ancienne nécropole. L'usage résidentiel demeure, les matériaux et les techniques de construction ont changé, mais c'est surtout le rapport avec les bâtiments préexistants (souvent considérés comme un obstacle à la spéculation immobilière) qui a changé, car le territoire perd sa vocation agricole et acquiert les caractéristiques d'un immense paysage touristique.

[13] E. Romeo, *Paesaggio agrario e archeologia: conservazione e valorizzazione*, en: «Architettura del Paesaggio», I (2009), pp. 50-63.
[14] C. Taşkıran, *Silifke and environs*, cit., pp.105-109.
[15] E. Romeo *Temple, church, mosque: transformation over the centuries*, en: V. Russo (édité par), *Landscape as Architecture*, Nardini Editore, Firenze 2014, pp. 241-246.

Les villages d'Akkale et de Kanytelleis font exception. Bien qu'ils conservent les traces d'un multiculturalisme séculaire, ils ne sont pas encore touchés par le tourisme de masse. La partie ancienne (le palais, les citernes, les thermes, les édifices religieux) du premier village, construit à l'époque byzantine, est abandonnée : non affectée par des actions de protection concrètes, elle apparaît comme figée dans le temps, sauf la présence, en arrière-plan, d'un complexe résidentiel moderne et d'une marina dans la baie où les navires byzantins accostaient autrefois. La continuité temporelle n'est représentée que par quelques touristes cultivés qui visitent les ruines et par quelques études timides qui essayent de réévaluer son importance culturelle[16].

A Kanytelleis, en revanche, la tour hellénistique et les monuments funéraires de l'époque romaine alternent avec des exemples de basiliques chrétiennes situées autour du gouffre sacré (Holy Chasm), le long duquel se développent la nécropole rupestre et le quartier résidentiel de l'époque byzantine. Contrairement à Akkale, ce site est fréquenté, même s'il semble abandonné. La continuité d'utilisation est garantie, par la présence du cimetière islamique moderne; par les signes d'une dévotion multiconfessionnelle qui rend hommage à la mémoire chrétienne du site; par des sentiers liés aux mythes païens avec la descente, à la nécropole rocheuse dans le gouffre (qui évoque l'Hadès païen et l'enfer chrétien); par des signes tangibles sur les branches des arbres au début du printemps, comme un souhait, selon une ancienne tradition islamique, d'une vie nouvelle et d'une dévotion renouvelée.

Conclusions

Les causes des processus d'abandon et de marginalisation sociale des habitants, encore présents, dans les villages analysés sont principalement dues aux phénomènes sismiques et à l'alternance de différentes confessions religieuses, dont on essaie de comprendre la dynamique grâce à une sensibilité toujours croissante vers les questions liées au multiculturalisme et grâce à l'attention portée à la sauvegarde du patrimoine culturel matériel (sites archéologiques, ruines diffuses, restes anciens et médiévaux) et immatériel (usages, coutumes, traditions).

Dans ce cas également, il est indispensable de proposer des interventions visant à combattre les phénomènes d'abandon présents surtout à Akkale, et de dégradation présents à Korykos, Elaiussa Sebaste et Kanytelleis. Il s'avère nécessaire de proposer des actions de valorisation qui, compte tenu des racines multiculturelles de ces contextes, augmentent la connaissance de ce territoire ; proposent la conservation du patrimoine matériel et immatériel; relancent

[16] C. Taşkıran, *Silifke and environs*, cit., pp. 119-121.

la valeur de la culture autochtone, sans négliger les aspects sociaux, anthropologiques et économiques, sans exclure les aspects touristiques. Cette approche méthodologique permettrait non seulement d'atténuer les phénomènes d'abandon et de marginalisation sociale, rendant les lieux visibles et accessibles, mais elle donnerait vie à un nouveau système/modèle de société interculturelle; on limiterait les transformations du paysage causés par les spéculations immobilières et illégales; de nouveaux scénarios de tourisme durable seraient proposés; des processus vertueux d'implication des jeunes générations - appartenant à toutes les cultures qui vivent encore dans leurs lieux d'origine et engagés dans la connaissance et la diffusion de la valeur du territoire[17] - seraient déclenchés, tout en respectant l'identité des contextes anthropisés, dans l'espoir d'échanges culturels de plus en plus fréquents et fructueux avec d'autres réalités sociales et religieuses.

[17] R. Rudiero, *Valorizzare un paesaggio archeologico: proposte per Elaiussa Sebaste*, cit., pp. 145-176.

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LE RÔLE DES VULNÉRABILITÉS SOCIALES ET PHYSIQUES DANS LA CONSTRUCTION DE LA CATASTROPHE SISMIQUE DE 2003 À BOUMERDES (ALGÉRIE)

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In last decade, Algeria records an increased damage from environmental hazards. Despite the policy of management risk and disaster risk with more emphasis through mitigation, preparedness and recovery programs to reduce injuries. Losses and damage have escalated and varied spatially. This revealed the existence of vulnerability issues that had not previously been identified or known. Reduce losses requires identification and evaluation of hazard. But the degree to which populations are vulnerable to hazards, however, is not solely dependent upon proximity to the source of the threat or the physical nature of the hazard—social factors also play a significant role in determining vulnerability. In this research we assess vulnerability using biophysical and social indicators to explain the disparities of losses and damage after the disaster of Boumerdes in 2003. Vulnerability has two faces internal and external factors, by modelling them, we reduce or we accent disaster risk. First, we expertise the built environment by evaluating the vulnerability of interior elements and different scales of damage, the built environment was already vulnerable before the seismic event. In second to explain the spatial disparities of damage and losses, we examined socioeconomic and demographic indicators to make a social vulnerability index. Using a factor analysis approach, indicators were placed in a model to calculate a summary social vulnerability score. The results conclude that the vulnerability assessment identified areas at risk and that the built environment was already vulnerable before the seismic event, while providing a basis for risk reduction planning in the Algerian context.

Keywords: Natural disasters, hazard, physical vulnerability, social vulnerability, human vulnerability, natural risk and the social construction of disaster risk.

Le couple vulnérabilité physique-vulnérabilité sociale et la construction de la catastrophe sismique de 2003 à Boumerdes

Entre 2000 et 2010, plusieurs événements naturels ont touché les villes Algériennes, situées sur le littoral, les hauts plateaux ou dans le Sud. Ces événements sont plus précisément les inondations de 2001 à Bab El oued (Alger), causant 900 décès, le séisme de 2003, ayant touché Boumerdes et Alger, qui a eu pour conséquences 2278 décès, et détruit 6715 habitations. Après la catastrophe, une estimation et une expertise des dommages causés aux bâtiments ont été réalisé. En effet, il est d'usage qu'après une catastrophe ces opérations soient effectuées, car l'évaluation de l'impact de l'aléa sismique sur les bâtiments est capitale pour estimer les coûts et les dommages, ainsi que pour comprendre les causes de cette

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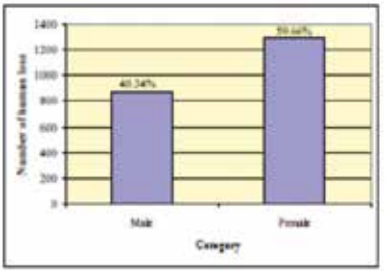
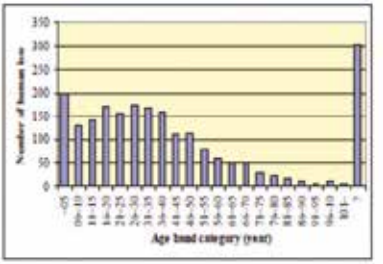




Pertes humaines selon le sexe et par âge de distribution (Source: Betchtoula, 2003).

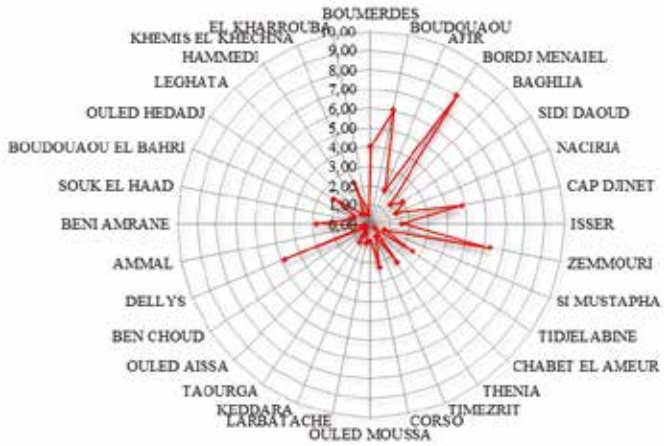
Les degrés de vulnérabilité physique par communes après le séisme de 2003 (Source: données CGS 2003 et traitement auteur).

catastrophe. Mais d'après (Piers Blaikie, Terry Canon, Ian Davis, Ben Wisner, 2004), le risque est une affirmation selon laquelle la vulnérabilité sociale et les formes multiples de risque sont la cause profonde de ces catastrophes.

Dès lors, la vulnérabilité est le concept central pour analyser les risques et les catastrophes. Précisons que le concept de vulnérabilité, selon (Veyret, 2003, p24), « est né de l'idée que l'aléa ne suffit pas à comprendre la survenue de catastrophe. Un aléa d'intensité faible pouvait par exemple avoir des conséquences très graves dans certaines sociétés, alors qu'un autre aléa d'intensité beaucoup plus forte y avait des impacts négligeables ». De son côté, (Cutter, 2003) observe que toutes les recherches jusqu'alors ont surtout apporté une attention particulière aux composantes biophysiques et à l'environnement bâti. Toutefois, durant cette dernière décennie c'est plus particulièrement l'aspect social de la vulnérabilité que l'on connaît mieux.

Pour ce qui est de la catastrophe, rappelons que l'Office des Nations Unies sur les catastrophes et la réduction des risques UN/DRR a défini la catastrophe comme « une perturbation grave du fonctionnement d'une communauté ou d'une société à n'importe quel niveau par suite d'événements dangereux, dont les répercussions dépendent des conditions d'exposition, de la vulnérabilité et des capacités de la communauté ou de la société concernée, et qui peuvent provoquer des pertes humaines ou matérielles ou avoir des conséquences sur les plans économique ou environnemental » (UNISDR, 2009).

Les notions et concepts centraux ici sont les conditions d'expositions, la vulnérabilité et les capacités de la société à y faire face. De plus, ces termes apparaissent dans les premières définitions sur la vulnérabilité. Cette dernière y est définie comme le degré de pertes et de dommages consécutifs dues à la survenu de l'aléa, et se mesure à partir de l'endommagement réel ou potentiel des éléments menacés par un aléa (Veyret, 2003; Reghezza, 2006 ; Dauphiné et Provitolo, 2013). Or, la vulnérabilité se réfère ici à l'exposition aux contingences et au stress, et à la difficulté à y faire face. C'est la raison pour laquelle nous considérons qu'elle possède deux aspects. Le premier aspect qui est externe,



est lié aux risques, aux chocs et au stress auxquels un individu ou un ménage est soumis. Quant au deuxième aspect, il est de nature interne et renvoie au fait d'être sans défense, autrement dit à un manque de moyens pour faire face sans subir de perte préjudiciable. Pour ce qui est de la perte elle-même, elle peut prendre plusieurs formes, à savoir devenir ou être physiquement plus faible, économiquement pauvre, socialement dépendant, humilié ou psychologiquement blessé (Chambers, 1989). Ajoutons que la vulnérabilité peut également renvoyer aux effets sur la communauté. Ainsi, (Alexander, 1997) définit la vulnérabilité comme des facteurs à long terme affectant la capacité d'une communauté à réagir aux événements ou la rendant vulnérable aux catastrophes.

Dans le contexte algérien, l'attention porte particulièrement sur les enjeux physiques et l'environnement bâti, tandis que le social à l'origine de cette vulnérabilité a été largement ignoré, et longtemps absent des rapports post-catastrophe. Ainsi, on quantifiait les pertes et les coûts des catastrophes en matière de dommages corporels et matériels, mais on occultait les facteurs humains et sociaux relatifs aux populations. Ce qui explique pourquoi malgré les efforts engagés pour prévenir les risques naturels, le nombre d'événements naturels n'a cessé de croître. C'est notamment ce prouve les constats fait au sujet des cas du séisme de 2016 à Médéa et des inondations de 2018 à Constantine ayant fait de multiples dégâts. De ce fait, on comprend que la connaissance de la vulnérabilité peut fournir un moyen pour contribuer à la réduction des risques, des dangers et des catastrophes, et ce en prenant en compte les constructions de risque, l'exposition, le danger, la résilience, la sensibilité et le rétablissement (Cutter, 1996).

Effondrement par type de structure, à gauche un bâtiment en maçonnerie et à droite un bâtiment collectif en béton armé R+4 à Dellys (source: auteur).

La vulnérabilité des communes par sexe (les femmes) avant le séisme de 2003 (Source: données RGPH 1998 et traitement graphique auteur).

Les indcies de vulnérabilité sociale des populations à l'échelle de chaque commune avant le séisme de 2003 (Source: RGPH 1998 et traitement graphique auteur).

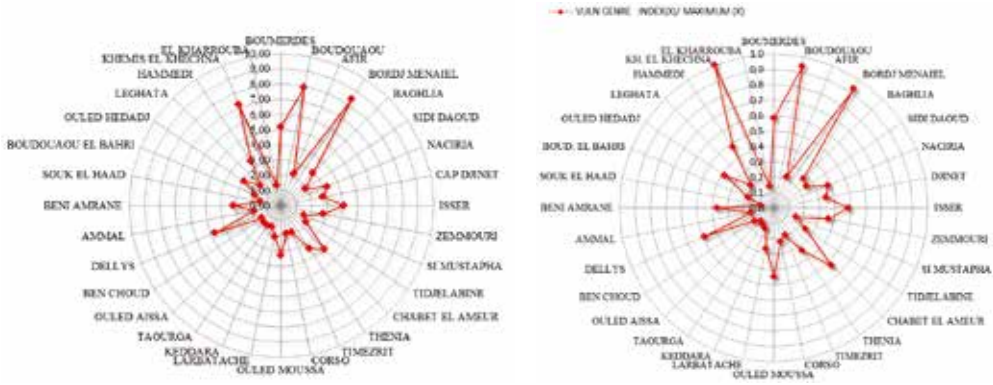
L'objectif scientifique de notre recherche est par conséquent de participer à l'élaboration d'une théorie générale sur les catastrophes en tant que phénomène social (*construit social* ou *construction sociale*). D'autre part, nous poursuivons un objectif social, car il s'agit par-là de proposer un outil de travail destiné aux gestionnaires de risque naturel à l'échelle locale et régionale. En effet, la prévention des risques commence par l'élimination des faiblesses sociales qui soumettent les communautés aux catastrophes.

En intégrant de la sorte la vulnérabilité dans notre compréhension des risques de catastrophe, nous reconnaissons le fait que la catastrophe ne dépend pas seulement de la gravité du danger ou du nombre de personnes ou d'actifs exposés, mais que cela reflète aussi la vulnérabilité des personnes subissant les pertes et dommages, mais aussi celle des objets physiques et naturels.

Les niveaux de dommages (et d'exposition) aident à expliquer pourquoi certains dangers qui ne sont pas extrêmes peuvent entraîner des impacts et des catastrophes extrêmes, contrairement à certains événements qui ne le sont pas. Autrement dit, l'aléa est identique, mais les impacts sont différents.

Pour comprendre la catastrophe sismique de 2003, et expliquer la construction de la vulnérabilité physique des enjeux matériels, ainsi que la vulnérabilité sociale des habitants des communes de la wilaya de Boumerdes, nous nous sommes interrogée sur comment ces deux dernières ont participé à la fabrication de cette catastrophe. À ces fins, nous avons commencé par la compréhension, l'analyse des facteurs et du processus à l'origine de ces vulnérabilités. Puis, nous avons vérifié l'hypothèse selon laquelle la catastrophe se construit socialement et physiquement.

Ainsi, premièrement, nous avons commencé notre analyse en partant de l'endommagement afin de privilégier l'enjeu, sa réaction face au risque et sa sensibilité à l'aléa. Pour ce faire, nous nous sommes intéressée aux manifestations du séisme sur les enjeux. Il existe plusieurs enjeux exposés aux phénomènes naturels, dont les enjeux matériels. Ils



dépendent du type de bâtiment, c'est-à-dire résidentiel, non résidentiel et de réseaux divers. Les bâtiments et les structures urbaines sont les premiers à réagir à une secousse tellurique. Les données disponibles sur le bâti ont permis de comprendre les dégâts sur un territoire. En outre, les bâtiments résidentiels sont un type de bâti représentatif, dont l'exploitation et l'analyse des données collectées issues de leur expertise post-catastrophe sismique de 2003, nous a permis d'estimer leur sensibilité, ainsi que leur impact sur la société et la population de la région de Boumerdes avant et après le séisme. De plus, la hiérarchisation et le classement par commune des enjeux matériels apportent des réponses sur pourquoi ces bâtiments se sont effondrés ou pas, et ce en fonction de leur exposition, et sur comment ils ont résisté à cet événement naturel. Nous avons observé que ces dommages ont directement influencé les fonctions que ces bâtiments assurent à l'échelle du territoire de la willaya de Boumerdes et des communes, par exemple celle du logement. Ce constat nous a menée à soulever la question suivante : *Comment ses dysfonctionnements ont-ils affecté les habitants, la société et l'organisation des activités dans ce territoire ?*

Méthodes et outils d'évaluation

Après la catastrophe sismique de 2003 qui a frappé la région de Boumerdes, une expertise des bâtiments endommagés a été établie par le Centre national de recherche appliquée en génie parasismique(M. Belazougui, N. Farsi, A. Remas, B. Mezazigh, 2003). Ces bâtiments ont été classés par degrés de dommages, selon un modèle d'évaluation appelé Échelle Macrosismique (EMS). Pour estimer la vulnérabilité des enjeux matériels, nous avons analysé ces données. Les degrés d'endommagement des bâtiments varient d'une commune à l'autre, et comme nous l'avons déjà mentionné le bâti résidentiel a été durement touché. C'est pourquoi pour classer les degrés et les indices d'endommagement par communes, nous

Les critères de la vulnérabilité sociale et humaine retenus pour évaluer la vulnérabilité des communes de la wilaya de Boumerdes (Source : Cutter et al. 2000).

Objectifs	Caractéristiques	Variables
Vulnérabilité humaine	Population et structure : La faiblesse physique des personnes les rend plus susceptibles d'être soumis aux dangers. On trouve une disparité dans l'accès aux ressources.	Densité de population ; Personnes âgées (65 ans et plus) ; Enfants moins de 05 ans ; Genre (femmes) ; Ménages monoparentaux et personnes isolées ; Personnes handicapées et malades de longue durée.
Vulnérabilité sociale	Vulnérabilité sur le bâti	Locataire de logement ; Immeuble collectif ; Foyer à faibles revenus ; Faible niveau d'éducation (pas d'étude après le secondaire).

avons appliqué la formule des quartiles avec pour objectif de faire ressortir les communes les plus touchées. La vulnérabilité physique des enjeux matériels dépend de trois facteurs qui sont l'exposition, la proximité entre un aléa et des enjeux, ainsi le rôle de la proximité dans les mécanismes d'endommagement. Notons que la résistance est la possibilité d'un système de contrecarrer une perturbation sans en subir les dégâts. C'est de la résistance physique des bâtiments que découle la sensibilité du système. Ainsi, la sensibilité est le degré d'endommagement que les enjeux peuvent subir. Par conséquent, plus les pertes seront importantes, plus la sensibilité sera élevée, et ce réciproquement (Dauphiné et Provitolo, 2013).

Pour expliquer la disparité des endommagements entre une commune et une autre, nous avons estimé la fragilité des éléments internes aux bâtiments à travers des facteurs physiques, à l'échelle de chaque commune de la région de Boumerdes. Les facteurs dépendants de l'aléa sont pour l'essentiel des indicateurs relatifs à la vulnérabilité physique, tels que le type de bâtiment, le nombre d'étages, les matériaux de construction, etc. Nous avons retenu trois facteurs que sont le système constructif, la période de construction et la hauteur du bâtiment pour estimer les différents degrés de dommage. Ces critères nous ont permis d'apporter des réponses sur les taux de dommage très importants des bâtiments.

Le premier critère est la typologie du système constructif, ce critère dépend des matériaux utilisés pour réaliser la structure portante du bâtiment, elle est de type maçonnerie, béton armé ou métallique. En cas de séisme, chaque structure se comporte différemment d'une autre. En règle générale, la structure en béton armé résiste mieux au séisme

si elle respecte les prescriptions et les normes techniques d'exécution. Le béton armé peut présenter certains défauts qui restent cachés (malfaçons), dès qu'il est secoué par un séisme, ces défauts causent des dégradations accélérées faute de cohésion parfaite des deux matériaux le composant que sont le béton et les armatures d'acier. Et parfois, la décomposition se propage jusqu'à la ruine. Cependant, dans le cas d'une structure en maçonnerie, lorsque cette dernière est soumise aux poussées horizontales violentes d'un séisme, les lits de mortier du mur en maçonnerie en conséquence n'arrivent pas à assurer une cohésion satisfaisante entre les blocs maçonnés qui dès lors se disloquent. Même pour des déformations modérées du mur, le mortier est ainsi le lieu de ruptures « fragiles ». Par ailleurs, les blocs eux-mêmes n'acceptent pratiquement pas une déformation sans rompre, ce qui n'est pas le cas du béton armé, qui résiste mieux grâce à ses armatures.

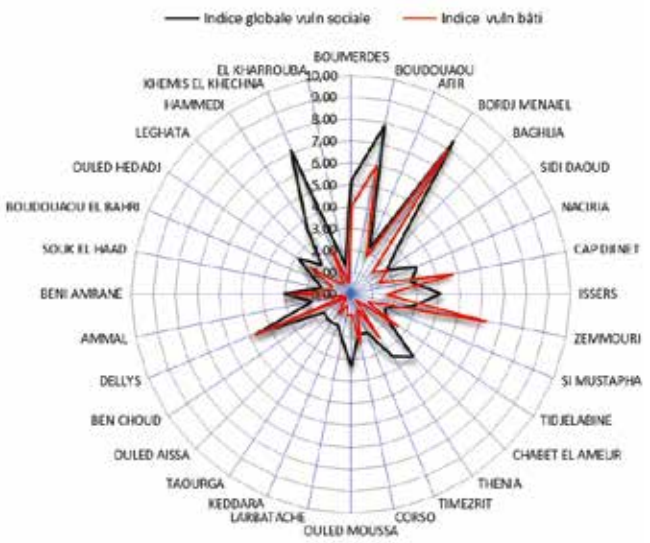
Le second critère est la période de construction, elle donne une indication sur la vétusté des constructions dans la mesure où l'entretien par les occupants des bâtiments est défaillant. Plus le bâti est mal entretenu, plus il devient vulnérable aux aléas naturels. On peut avec l'âge du bâtiment également évaluer le respect et l'application des règles parasismiques lors de la construction des bâtiments. Ainsi, avant et après 1962, les bâtiments réalisés durant cette période étaient soumis aux règles du code parasismique de 1956 (code français). Après 1980, on a appliqué les règles parasismiques Algériennes de 1988 (RPA 1988), modifiées en 1999.

Le dernier critère est le nombre d'étages, en cas de dommages, les pertes sont en principe plus importantes pour une construction à plusieurs étages, et ce sont les bâtiments à faible hauteur qui résistent le mieux au séisme.

Les endommagements enregistrés sur les enjeux matériels étaient très importants. Cette vulnérabilité a influencé directement les fonctions sociales de la vie quotidienne des populations. On trouve un autre enjeu qui a contribué l'accroissement du nombre de pertes humaines. Il s'agit de la vulnérabilité sociale des populations : « La probabilité d'occurrence du phénomène physique extrême est constante. Si cette probabilité est constante, la seule explication logique à l'augmentation des catastrophes doit être recherchée dans la vulnérabilité croissante des populations au phénomène physique extrême » (Wisner, 2004, p11)

Nous pensons qu'avant le séisme de 2003, les populations et la société constituée des communes de la wilaya de Boumerdes étaient vulnérables et cela a participé pleinement dans la construction du risque de la catastrophe sismique de Boumerdes, comme le souligne (Cutter et al., 2003) avec ses propos : « La vulnérabilité est le pré-événement, caractéristiques des systèmes sociaux qui créent le potentiel pour un risque ou une catastrophe».

La vulnérabilité sociale est plus souvent décrite en utilisant les caractéristiques individuelles des gens (âges, race, santé, réseau, type de logement, emploi), ces facteurs influent et forment



Des communes à forte vulnérabilité globale (source: RGPH 1998, CGS 2003 et auteur).

la sensibilité des différents groupes qui subiront les dommages. Ils auront pour effets de nuire ou de diriger leur capacité de réponse. Ils indiquent également les lieux où se cristallisent les inégalités sociales (Dauphiné et Provitolo, 2013).

Par conséquent, l'évaluation de la vulnérabilité sociale nécessite la sélection d'un ensemble d'indicateurs permettant de la caractériser au mieux. C'est la raison pour laquelle intégrer la vulnérabilité sociale de la population à un outil d'évaluation du risque humain est pertinent, puisqu'il constitue un des facteurs aggravant les conséquences de l'aléa (Cutter et al., 2003).

Nous avons exploité les données socio-économiques et démographiques pour construire un indice de vulnérabilité social. Avec cette approche analytique des facteurs, nous avons retenue dix variables (Tab. 1). L'analyse de ce tableau non exhaustif montre que certains indicateurs de vulnérabilité sont utilisés dans plusieurs approches répertoriées. Il s'agit en particulier d'indicateurs relatifs à l'âge de la population (personnes mineures et personnes pauvres), au revenu des ménages (revenu moyen, personnes pauvres, foyer sans voiture, propriétaire ou locataire du logement) ou encore au statut du ménage (ménages monoparentaux). Ces indicateurs sont des indicateurs relatifs à la vulnérabilité sociale (ou socio-économiques), ce sont des indicateurs indépendants de l'aléa. ils ont été placés dans un modèle additif pour calculer un score sommaire de la vulnérabilité humaine et sociale des communes de la wilaya de Boumerdes, en prenant pour fondement

les travaux de Cutter et al. (2000) portant sur « la vulnérabilité des personnes et des places du Comté de Georgetown, Caroline du Sud ».

Pour ce qui est des indicateurs sexe (femme) et enfants, il faut préciser que le taux de pertes corporelles par sexe était très important pour les femmes, car le séisme a frappé à 19 h 44, or, les femmes étaient chez elles à cette heure-ci. Il en est de même pour les enfants, qui en effet avaient terminé les cours depuis plus de 2 heures. Ce qui explique les taux de pertes très élevés enregistrés non seulement chez les femmes, mais aussi chez les enfants (Fig. 1), alors que ces deux catégories constituent les groupes sociaux les plus fragiles.

Quant aux indicateurs *personnes âgées et malades*, nous avons observé que les personnes âgées (65 ans et plus) peuvent présenter des difficultés de mobilité qui ralentissent leur capacité à se préparer avant la catastrophe, mais aussi à évacuer durant le sinistre. Elles auront ainsi besoin de l'aide de membres de leur famille ou des services de sécurité civile pour évacuer les lieux. En revanche, pour les personnes handicapées et malades de longue durée ayant une mobilité réduite, l'évacuation nécessite l'assistance de plusieurs personnes, que ce soit des membres de la famille ou des intervenants externes (pompiers, sécurité civile, etc.). Cette catégorie dispose de capacités physiques très réduites pour protéger le bâtiment et leurs biens contre le séisme, ce qui la rend généralement plus exposées au danger.

Les indicateurs *personnes vivant seules* se rapportent entre autres aux personnes vivant seules et/ou disposant de faibles liens familiaux, et qui se retrouvent dès lors seules durant le séisme. À ce sujet, notre enquête à Dellys en 2017 a révélé l'existence de nombreux ménages à un seul individu.

Pour les critères de vulnérabilité sociale, nous avons retenu les indicateurs qui ont un effet direct sur le bâti.

Concernant l'indicateur, *locataires du logement*, nous avons constaté que les locataires et les personnes vivant gratuitement sont généralement présents dans le logement depuis moins longtemps que les propriétaires. Ils sont donc moins enclins à mettre en place des mesures de protection ou d'adaptation du bâtiment, car ces derniers estiment que les coûts de ces mesures sont à la charge du propriétaire du bâtiment ou du logement. Il est ainsi moins probable qu'ils aient connaissance de ce phénomène naturel qu'est le séisme. Ils y sont donc souvent moins bien préparés.

Quant à l'indicateur, *instruction*, il renvoie au fait que le niveau faible d'éducation limite les capacités à comprendre les informations d'avertissement et l'accès aux informations pour se préparer au séisme.

Pour l'indicateur, *revenus ou ressources*, nous avons noté que les foyers à faibles revenus disposent de ressources financières limitées pour mettre en œuvre des mesures de protection

du bâtiment et de leurs biens. Leur niveau d'exposition aux aléas naturels est par conséquent souvent plus élevé. Lors de notre enquête à Dellys 2017, nous avons observé que les foyers à faibles revenus rencontraient plus de difficultés à retrouver des conditions de vie identiques à celles précédant la catastrophe, et ce parce qu'ils manquent de moyens financiers.

En outre, pour estimer ces critères, nous avons exploité les seules données détaillées disponibles sur les populations et la société de Boumerdes avant 2003, qui sont les données du recensement de la population et de l'habitat (RGPH) réalisé en 1998.

Boumerdes: une région a vulnérabilités multiples face au risque sismique

Un phénomène sismique omniprésent

Le risque est une éventualité, un dommage potentiel lié à l'occurrence d'un événement naturel, l'une des composantes du risque naturel est l'événement d'un danger ou d'un aléa naturel. Cet aléa se définit notamment par une probabilité de réalisation (Veyret, 2003). Cette probabilité elle-même dépend directement de l'histoire des événements passés. C'est la raison pour laquelle, il est primordial de revenir sur les séismes antérieurs pour cerner au mieux ce phénomène naturel.

Boumerdes, est un territoire côtier du centre de l'Algérie, il s'étend sur une superficie de 1456,16 km2 avec une façade littorale de 100 km, et se situe entre le cap de Boudouaou El Bahri à l'est d'Alger et les limites de la commune d'Afir à l'ouest de la wilaya de Tizi-ouzou. Cette localité constitue en outre un regroupement de 32 communes, réparties sur l'ensemble de son territoire d'est en ouest.

Ces ensembles morphologiques et structuraux résultent d'une évolution tectonique complexe, à savoir la convergence de deux grandes plaques continentales d'Afrique et d'Eurasie. La région de Boumerdes étant comprise dans la partie septentrionale de l'Atlas Tellien, elle se rattache ainsi avec cet ensemble au grand système Alpin méditerranéen, où prédominent des roches facilement érodables[1].

Les déformations quaternaires dans l'Atlas Tellien indiquent l'existence de pli-failles sur une bande étroite d'est en ouest. L'imbrication des failles inverses et les plis associés déversés vers le sud-est ont été provoqués par une déformation compressive liée à ces deux grandes plaques (Meghraoui, 1988). Les séismes modérés à faibles magnitudes de la région de Boumerdes étaient surtout dus à l'activité sismique de la faille de Thénia,

[1] Nous avons exploité les données du rapport établi par les services de la protection civile de la wilaya de Boumerdes 2003.

puisque au cours de l'histoire cette région a était touché par trois événements importants et à forte intensité, le séisme du 2 janvier 1365 d'une intensité (X) qui aurait détruit Alger et généré un petit tsunami, un deuxième le 3 février 1716 d'une intensité (X), détruisant probablement à nouveau Alger, et le dernier celui du 29 octobre 1989 d'une magnitude de 6.0 qui a touché la région de Tipaza (Yelles-Chaouche et al., 2006, p129).

Le 21 mai 2003[2], la région a tremblé après un séisme qui s'est produit à 19 H 44 et 36 s (18 h 44 GMT), dont l'épicentre se situe en mer à environ 7 kilomètres au nord de Zemmouri. Les coordonnées sont 36°.91N et 3°.58E, et le foyer a été localisé à 10 kilomètres de profondeur. La magnitude a été estimée par le Centre national de recherche en astronomie astrophysique et géophysique Alger (CRAAG) à 6,8 sur l'échelle ouverte de Richter.

Cette intensité a été observée et ressentie dans les régions de Boumerdès et d'Alger, sur une zone allant principalement de Blida à Dellys, soit une surface approximative de 150 km x 80 km. Ce séisme a été largement ressenti dans les wilayas limitrophes (Medéa, Tipaza, Bejaïa et Bouira) et jusque dans les îles Baléares au Nord, à 300 km de l'épicentre. Ce choc principal a été suivi, dans les jours suivants de centaines de répliques, la plus forte atteignant une magnitude de 5.8. Voilà donc les éléments géophysiques caractérisant ce séisme (figures 2). *Cependant, qu'en est-il des enjeux matériels et humains ?*

Analyse des facteurs vulnérables

À la fin de l'année 2002[3] , la région de Boumerdes comptait 112643 logements répartis sur 32 communes pour une population de 710024 habitants. La cellule de gestion de crise de la wilaya de Boumerdes a déclaré 56401 logements endommagés sur tout le territoire, soit la moitié des bâtiments résidentiels. En outre, des taux importants ont été enregistrés au niveau des daïras de Bordj Menail, Dellys, Boudouaou et Boumerdes, ce qui montre que le bâti résidentiel était effectivement fragile. L'analyse des données statistiques de l'expertise des bâtiments endommagés sont classées par degrés de dommages, ces degrés sont similaires au modèle d'évaluation appelé Échelle Macrosismique (EMS). La plupart du bâti résidentiel a été touché à des degrés et à des indices différents. L'application de la formule des quartiles nous a permis de ressortir les communes les plus touchées qui sont Boudouaou, Bordj Menail, Dellys, Zemmouri, Cap Djinet, Boumerdes, Beni Omrane et Tidjelabine. Le bâti de ces communes était assurément plus sensible et vulnérable avant le séisme du 21 mai 2003. L'événement sismique a eu pour effet de dévoiler cette vulnérabilité physique.

[2] Les rapports des missions de l'association française de génie parasismique(AFPS, 2003) et du Centre national de recherche appliquée en génie –parasismique CGS 2003, celui de la protection civile de la wilaya de Boumerdes. Et le dernier le rapport (Japan Association of Earthquake Engineering (JAEE) et al., 2004)

[3] Rapport de la protection civile de la wilaya de Boumerdes, fin 2003.

Indice de vulnérabilité du genre (femmes) par commune (Source :Données RGPH 1998 et traitement auteur).

COMMUNE	TOTAL COMMUNE	TOTAL WILAYA	RATIO COMMUNE SUR LE TOTAL WILAYA (X)	Indice : VULN GENRE INDEX(X)/ MAXIMUM (X)
BOUMERDES	16617	203535	0,08	0,58
BOUDOUAOU	26662	203535	0,13	0,94
AFIR	6256	203535	0,03	0,22
BORDJ MENAIEL	26470	203535	0,13	0,93
BAGHLIA	7707	203535	0,04	0,27
SIDI DAOUD	7212	203535	0,04	0,25
NACIRIA	10759	203535	0,05	0,38
DJINET	9821	203535	0,05	0,34
ISSER	13792	203535	0,07	0,48
ZEMMOURI	10275	203535	0,05	0,36
SI MUSTAPHA	4387	203535	0,02	0,15
TIDJELABINE	6947	203535	0,03	0,24
CHABET EL AMEUR	15096	203535	0,07	0,53
THENIA	9475	203535	0,05	0,33
TIMEZRIT	5401	203535	0,03	0,19
CORSO	6347	203535	0,03	0,22
OULED MOUSSA	12669	203535	0,06	0,44
LARBATACHE	7640	203535	0,04	0,27
KEDDARA	4157	203535	0,02	0,15
TAOURGA	3626	203535	0,02	0,13
OULED AISSA	3385	203535	0,02	0,12
BEN CHOUD	4315	203535	0,02	0,15
DELLYS	13813	203535	0,07	0,48
AMMAL	4263	203535	0,02	0,15
BENI AMRANE	10511	203535	0,05	0,37
SOUK EL HAAD	2387	203535	0,01	0,08
BOUD. EL BAHRI	5061	203535	0,02	0,18
OULED HEDADJ	10887	203535	0,05	0,38
LEGHATA	5926	203535	0,03	0,21
HAMMEDI	13544	203535	0,07	0,48
KH. EL KHECHNA	28536	203535	0,14	1,00
EL KHARROUBA	4050	203535	0,02	0,14

De plus, nous avons remarqué des taux importants de dommage du bâti résidentiel des communes proche de la zone épicentrale comme à Zemmouri et Bordj Menail. Néanmoins, cela n'a pas été forcement observé après le séisme de 2003 dans les communes les plus éloignées telles que Cap Djinet, Boumerdes, Beni Omrane et Tidjelabine, Boudouaou et Dellys. La distance à l'épicentre n'est donc pas le critère déterminant expliquant le degré de dommage du séisme de 2003, elle dépend d'autres critères (Fig. 3).

Pour évaluer la fragilité du bâti, nous avons analysé les facteurs internes à cet enjeu. À cet effet, les taux de dommage ont été estimés par critère en exploitant les données statistiques des bâtiments endommagés sur le total des bâtiments résidentiels existants au niveau de chaque commune au 31 décembre 2002. Par la suite, nous les avons classés à l'aide d'un tableau Excel afin d'évaluer leurs vulnérabilités par endommagement.

Les résultats obtenus sont les suivants. Les bâtiments en béton armé ont subi de nombreux dommages dans 19 communes, tandis que pour 11 communes, ce sont essentiellement les bâtiments en maçonnerie qui ont été touchés. Toutefois, les observations soulignent bien que les deux typologies de structure ont subi des dommages élevés (Fig. 4).

Les dégâts du séisme du 21 mai 2003 sur les bâtiments étaient considérables. Les éléments internes des enjeux matériels étaient très sensibles, ils ont mal résisté à ce phénomène naturel. D'où le fait que nous pensons qu'ils étaient vulnérables avant l'avènement du séisme, et que cette catastrophe a eu pour effet, dans les communes les plus touchées, de révéler cette vulnérabilité physique cachée. Par conséquent, la question qui nous interpelle est : *Pourquoi les communes n'ont pas subi les mêmes degrés de dommages ?* Selon (Cutter, 2003) « Les causes des catastrophes naturelles sont à chercher non seulement dans le processus physique, mais surtout dans l'incapacité des sociétés locales à y faire face ». Précisons que le fait que désormais l'aspect social de la vulnérabilité soit mieux connu facilite l'analyse pour y apporter des réponses.

Des vulnérabilités, sociale et humaine cachées

Afin d'apporter des réponses sur les disparités dans la répartition des dommages à l'échelle des communes de la wilaya de Boumerdes, ainsi que dans le but d'analyser et d'évaluer la vulnérabilité humaines et sociales de cette région, nous avons choisi de relever les indicateurs utilisés dans quelques études portant sur cette vulnérabilité. Il s'agit de travaux s'intéressant à l'intégration de l'approche d'analyse de la vulnérabilité sociale, à l'instar des travaux de Cutter et al. (2000). Notre objectif est de faire un bilan de la situation des populations des communes avant le séisme, et comment elle a participé dans la construction du risque catastrophe de 2003.

Nous avons choisi d'examiner les caractéristiques de la population et leur environnement résidentiel, toutefois sans remonter aux origines des causes sous-jacentes expliquant cette vulnérabilité, puisqu'il ne s'agit pas de notre propos ici. Ces variables fournissent une première métrique pour opérationnaliser et estimer la vulnérabilité sociale de chaque commune.

Plutôt que d'utiliser des pourcentages simples, chaque variable sociale a été normalisée en déterminant d'abord le ratio de cette variable dans chaque recensement de la commune au nombre total de cette variable dans la wilaya. Par exemple, pour calculer l'indice de la vulnérabilité du sexe féminin, nous avons compilé le nombre de femmes dans chaque commune de recensement (colonne 2), de même que le nombre total des femmes dans la wilaya (colonne 3). Le rapport du nombre de femmes au total pour la wilaya a été calculé (colonne 4), et cette valeur (X) était divisée par la maximale valeur (X) pour créer un index compris entre 0 à 1,00. Les valeurs les plus élevées indiquent une plus grande vulnérabilité (Tab. 2 et Fig. 6).

Toutes les autres variables humaines et sociales ont été standardisées de cette manière, une fois les valeurs d'indices calculées, ils ont été affectés à chaque commune et les valeurs d'index pour chaque variable ont été additionnées pour obtenir un score d'indice composite pour chaque commune (Fig. 7). Cette valeur représente une mesure globale de la vulnérabilité humaine et sociale.

En outre, ces indices ont également été placés dans des quartiles et présentés visuellement comme quatre catégories. Chaque indicateur de vulnérabilité sociale peut être examiné indépendamment et par commune. Cependant, il s'agit du résumé de toutes les mesures produisant un large aperçu de la distribution spatiale de la vulnérabilité sociale et humaine dans les communes étudiées.

Nous avons estimé les scores de chaque commune, à savoir celles ayant obtenu un score élevé. La société et les populations de celles-ci étaient en effet vulnérables avant l'avènement sismique de 2003. Ce sont les communes de Brodj Menail, Boudouaou, Boumerdes, Naciria, Isser, Chabet El Ameur, Thenia, Dellys, Hammadi et Khemis El khachena.

Avant 2003, ces communes étaient exposées à un événement naturel probable, nous pensons dès lors qu'elles sont les plus sensibles à n'importe quel danger naturel qui pourrait frapper la région. Alors nous avons vérifié cette sensibilité après la catastrophe sismique du 21 mai 2003.

Conclusion : des communes à forte vulnérabilités physique, sociale et humaine

La région de Boumerdes est exposée à l'aléa naturel, et cette composante est omniprésente. Cependant, une autre composante a joué un autre rôle central dans cette catastrophe. Il s'agit de la fragilité des constructions, puisque leurs mauvaises résistances à l'aléa naturel a considérablement augmenté leurs endommagements. La vulnérabilité des facteurs internes aux enjeux matériels a contribué au fait que certaines communes, contrairement à d'autres, ont subi des pertes et des dommages considérables. Les bâtiments résidentiels les plus vulnérables physiquement, en d'autres termes qui ont un degré de dommage élevé, sont ceux des communes de Boudouaou, Bordj Menail, Zemmouri, Cap Djinat, Dellys, Boumerdes, Beni Omrane et Tidjelabine, Ouled Hadadj, Khemis el Khachna et Isser.

Nous avons couplé ces degrés d'endommagement par communes avec les indices de vulnérabilité sociale des populations avant 2003, puis nous avons retenu les communes les plus vulnérables. Ces dernières sont Brodj Menail, Boudouaou, Boumerdes, Isser, Chabet El Ameur, Dellys, Khemis El khachena (figure 8). De ce fait, nous pouvons confirmer que les communes qui ont obtenus des scores élevés, relativement à leur vulnérabilité sociale et humaine avant 2003, sont également celles qui ont été durement touchées après le passage de la catastrophe sismique. De plus, la vulnérabilité des facteurs physique des enjeux matériels a attesté que le risque était construit avant l'apparition de cette catastrophe, mais il était caché, et a été révélé par celle-ci. Dans le cas de la vulnérabilité globale de la région de Boumerdes face à l'aléa naturel, il semble que la dynamique s'inscrive dans le temps et l'espace. Plusieurs facteurs physiques, sociaux–économiques et humains ont créé des variations spatiales de la vulnérabilité qui s'est manifestée au niveau des communes à des différentes échelles de dommages et de pertes. Cela explique la construction du risque sismique avant l'avènement du séisme de 2003.

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LA CITÉ MINIÈRE DE DJERISSA, UN PATRIMOINE INDUSTRIEL EN ABANDON

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La mine de Djerissa (1907), (2020) Source : Archives de la société Djebal Djerissa, Photo de l'auteur.

Our study will be based on a new town planned by the frensh protectorate after the discovery of an iron mine in Djerissa which is located 50 kilometers from the town of Kef in Tunisia. It is about learning the urban and socio-economic evolution, the growth of the city through unpublished researchs in the Tunisian National Archives by restoring the exact history of the city and its components. However, the work will include an analysis, a study, surveys and graphic renditions of this mining town.
We will start with the colonial urban core as well as the regular grid and traffic roads. We will then approach an architectural study that will distinguish the three components of the city: the residential district, the public facilities and the industrial complex.
The cessation of mining has caused several problems such as the problem of supplying the population, the reason why the mineworkers, whether indigenous or foreign, began to look for work elsewhere and consequently quit. The city quickly was abandoned.
The purpose of our intervention will be to highlight the particularity of this living heritage, the impact of its abandonment, its current critical state. A projection will then look for possible management strategies at several levels.

Mots clefs: Tunisie, Djerissa, Cité minière, Patrimoine industriel

Introduction

L'industrialisation du monde s'accélère au XIX^{e} siècle et devient le symbole de la société moderne. L'activité minière se développe et une vraie course aux concessions est menée. Des exigences sont d'attirer cette nouvelle population de travailleurs : les mineurs. Pour les loger, les compagnies minières construisent les cités ouvrières concentrées sur les puits de mine. De ce contexte, un paysage particulier qui marie productivité et logement naît.

Dans le cadre d'une Tunisie coloniale, les français explorent les meilleures ressources du pays mises à profit des sociétés étrangères. Notre étude se base sur Djérissa dont les mines étaient sous le contrôle de la Compagnie algérienne de Crédit et de Banque, qui représentaient la Banque de l'Union parisienne. Ce village minier *particulièrement bien aménagé avec école, pharmacie, église, jardins, constitue le centre minier tunisien le plus remarquable et le mieux installé*. (L'Écho des mines et de la métallurgie, 1927)

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Lamia Hadda, Saverio Mecca, Giovanni Pancani, Massimo Carta, Fabio Fratini, Stefano Galassi, Daniela Pittaluga (edited by), *Villages et quartiers à risque d'abandon. Stratégies pour la connaissance, la valorisation et la restauration*, © 2022 Author(s), content CC BY-NC-SA 4.0 International, metadata CC0 1.0 Universal, published by Firenze University Press (www.fupress.com), ISBN 978-88-5518-537-0 (PDF), DOI 10.36253/978-88-5518-537-0

Situation géographique de la délégation de Djérissa- Gouvernorat du Kef-La Tunisie
Source : rtci.tn.

La mine de Djerissa (1907), (2020)
Source : Archives de la société Djebal Djerissa, Photo de l'auteur.

L'axe principal des équipements parallèle au chemin de fer (premier plan), la petite Sicile et le village français (second plan) (1939)
Source : Archives Nationale de la Tunisie SG série 10 Carton 9 dossier 6.

L'enjeu est de mettre en valeur le développement de ce territoire de mémoire et de tenter de renouveler sa politique urbaine. On doit prendre en compte ses spécificités et son histoire industrielle et sociale pour créer un nouveau regard sur ce patrimoine vivant. Une bonne connaissance du site et de ses composantes nous aidera à identifier ses points forts qui ont marqué, à l'époque, une nouvelle tradition minière et coloniale en Tunisie. Dans cette logique, on tentera de montrer à la fois la valeur historique et le potentiel architectural actuel de Djerissa. Alterner entre passé et présent, photographies et plans fera ressortir la mémoire du bâti garant du lien entre les générations.

Djerissa : situation géographique et historique

Djerissa (ou Jérissa) est une ville-délégation du nord-ouest tunisien. Entourée par les délégations de Tajerouine, Dahmani, Thala et Kalâa El-Khasba, elle est rattachée administrativement au gouvernorat du Kef et est située à 220 Km de la Capitale.

Elle est implanté sur un canyon entre deux monts de la chaine de l'Atlas : Djebal Djerissa (+816m) au sud et Djebal Om Khalil (+750 m) au nord. Son climat est subtropical humide chaud sans saison sèche. Sa température moyenne est de 14.5°C avec un écart thermique de l'ordre de 30°c entre un hiver très froid et neigeux et un été à température moyenne de 30°c dépassant 40°c en juillet.

D'origine berbère, on accorde aux amazighs l'attribution de son nom signifiant colline. La région a été occupée depuis longtemps par plusieurs civilisations vu sa situation entre

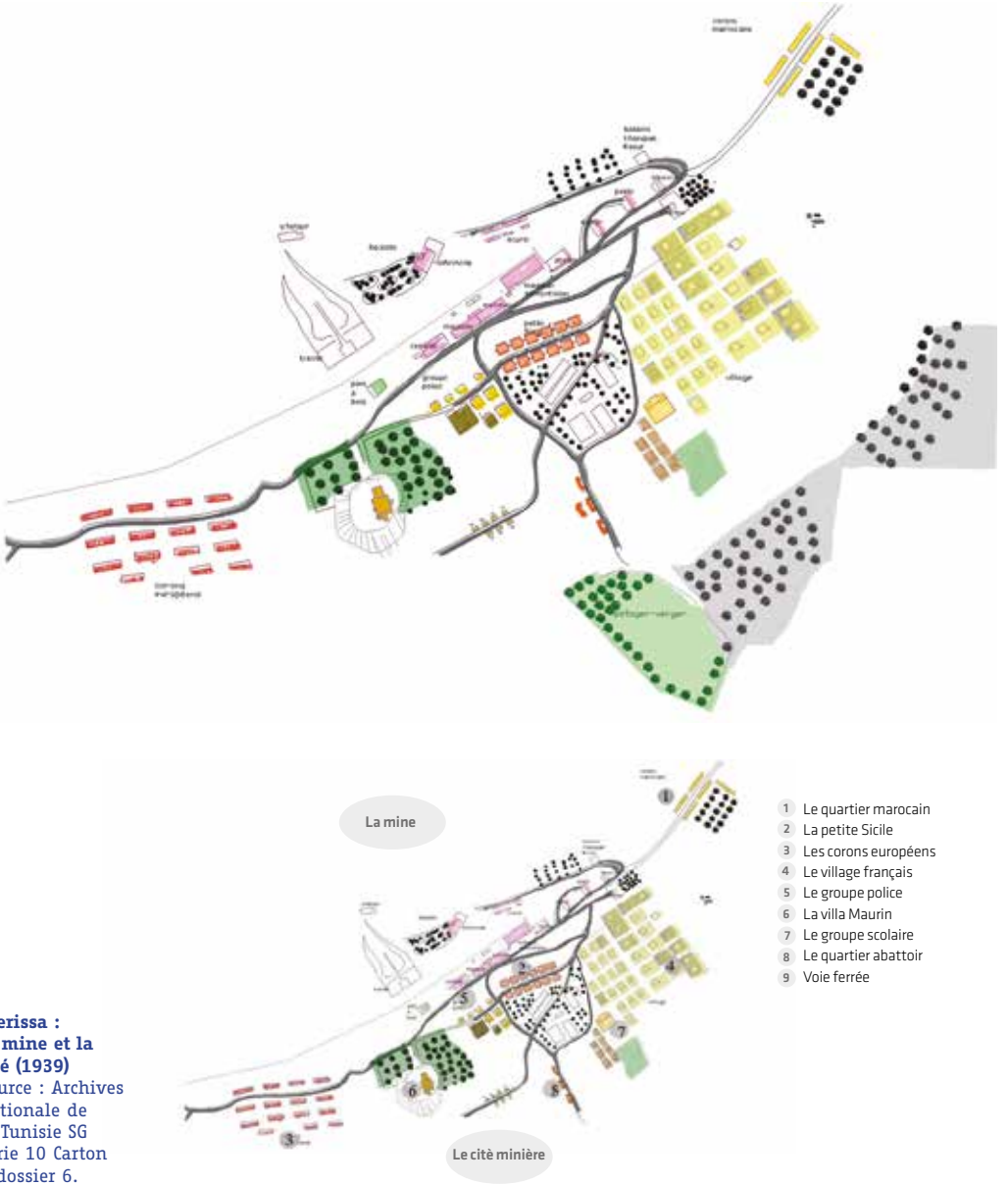
les deux sites archéologiques : celui d'Althiburos (el-Mdeina – Dahmani) et celui de la Table de Jugurtha (Kalâa Senan). La discontinuité de l'habitat caractérisait la vie rurale avant la colonisation avec une organisation spatiale plutôt introvertie.
Le gisement du Djebel Djérissa a été découvert à partir de 1880.La procédure de la concession de la mine a duré deux ans ; cela dit que la mise à l'enquête de demande de concession s'est faite le 20 mai 1899 et que l'approbation de la convention était le 1 er juin 1901 par Ali Pacha-Bey, professeur du royaume de Tunis. Dénommée « Concession du djebel Djerissa », elle couvre une surface d'environ 1400 hectares 68 ares 80 centiares (1.400 hect 68 ar.80 cent), dont le siège social est à Paris. (ANT Série E-C31)

La cité minière de Djérissa

Il s'agit d'une structuration totale et nouvelle qui doit impérativement marier deux fonctions élémentaires : la production et le logement. La mine est en ségrégation spatiale avec le village minier qui est la zone d'habitat et de service, alors que la zone d'habitat est en disparité socio-spatiale qui se manifeste par la typologie d'habitat. On repère une proximité entre la communauté européenne (le village français, les corons européens et la petite Sicile) alors que les corons marocains, kabyles et indigènes sont repoussés loin de cette zone.

La mine et la production

Djerissa est la plus importante des mines de fer de la Tunisie découvertes ou exploitées depuis la colonisation. La mine arrive de loin en tête de la production de minerai de fer et est outillée pour assurer facilement l'embarquement de 500.000 t. par an. En 1905, l'ensemble de la mine est installé avec 4 millions de tonnes de minerai riche, exempt d'impureté, constitué par un mélange d'hématite brune et rouge à 52-55 % de fer et 2 % de manganèse. Il est à la base même de la production de la fonte pour laquelle il est très recherché. Le minerai de Djerissa est particulièrement apprécié par les métallurgistes anglais. Raison pour laquelle, il est exporté principalement en Angleterre par le port de Tunis. (L'Écho des mines et de la métallurgie, 1905).
L'extraction de fer se fait par le système des galeries souterraines verticales et horizontales faites à plusieurs niveaux, généralement de 300 à 1000 m de profondeur. .
La mine souterraine est composée de galeries soutenues par 2 méthodes : celle des murs verticaux en pierre, des poutres en IPN et des poutrelles en béton armé et celle des roches elles-mêmes. (Ammar&Badrani, 2018)
Le minerai passe par plusieurs transformations dans le carreau de la mine. Il commence par sortir du fond de la galerie. Les wagons passent par la station de culbutage pour le verser dans



Djerissa : la mine et la cité (1939)
Source : Archives Nationale de la Tunisie SG série 10 Carton 9 dossier 6. Reproduction de l'auteur.

le concasseur. Il est ensuite concassé et transmis par les convoyeurs vers le fourneau puis vers le refroidisseur. Finalement, il est dirigé vers la trémie qui l'écoule dans les wagons de train pour assurer son transport vers le port de la Goulette en direction des terres françaises.
Son paysage industriel actuellement en friche représente une richesse iconique dotée d'une énorme capacité à se reconvertir. Les silhouettes de son carreau et sa trémie se fondent harmonieusement avec le paysage offrant un contraste entre un caractère artificiel et un relief naturel. Ces éléments influent sur les perceptions et renforcent la qualité des vues sur les grands repères miniers.

Le village minier

Evolution urbaine :

Après la mise en place des installations nécessaires et du chemin de fer, l'exploitation minière commence activement ses travaux de développement en 1907 avec la fondation de la société Djebel Djerissa et la construction de son bureau de direction la même année. Réellement, la villa Maurin (nom du premier directeur de la mine) est la première à être bâtie dans la cité en 1905. Elle abrite les fonctions et la gestion de la compagnie.
La société incite les indigènes au travail minier. Ensuite, elle invite des travailleurs de nationalités maghrébines et européennes pour s'y installer. Il en résulte un recrutement massif d'ouvriers italiens, français, marocains, tripolitains et algériens. En 1908, le village, autour de l'exploitation de la plus importante mine de fer du pays qui fournit plus de 70% de sa production totale, se développe avec un nombre d'ouvriers estimé à 600 et on vient alors construire le premier noyau urbain pour les loger.
Les corons siciliens (quartier de la Petite Sicile) et les corons européens sont les premiers à être construits entre 1908 et 1909.

En 1911, On continue à constituer un centre convenable susceptible d'attirer encore la main-d'œuvre indigène et étrangère : les recherches et l'exploitation ont confirmé toutes les prévisions sur l'allure en profondeur de la masse minéralisée. (L'Écho des mines et de la métallurgie, 1911)

Entre 1910 et 1919, on trace la voie principale qui relie le bâtiment de la direction à la mine et on l'aménage par des édifices publics et de service. Pendant cette période, le village français est édifié, à la manière des cités jardins, conçu pour les ingénieurs et les techniciens français à l'image de leurs villes natales. En 1930, la cité minière est achevée et ce n'est qu'en 1950 qu'on construit le dispensaire et la deuxième partie du quartier des ingénieurs. La fin du protectorat n'a pas marqué la cité que par le rajout d'équipements socioculturels comme le club des ingénieurs.

Bureau de la direction (1908), (2020)
Source : Archives de la Société de Djebal Djerissa -Photo de l'auteur.

L'axe principal des équipements parallèle au chemin de fer (premier plan), la petite Sicile et le village français (second plan) (1939)
Source : Archives Nationale de la Tunisie SG série 10 Carton 9 dossier 6.

Un seul sens existe pour le développement de la ville vu la limite naturelle qui est la montagne et l'oued.

- **La structure urbaine :**
  Comme tous les tissus coloniaux, le village minier Djerissa présente une trame urbaine relativement régulière. On distingue deux types de voies de circulation ; la principale autour de laquelle sont structurés les bâtiments publics et la secondaire qui dessert les quartiers résidentiels qui révèle la mise en place d'une ségrégation sociale et ethnique entre les quartiers des ingénieurs et des ouvriers et ceux des européens et des arabes. Le village français se distingue par sa trame orthogonale et son plan en damier situé sur un terrain urbanisable, il est éloigné de la zone industrielle et à proximité des équipements. Quant aux corons, ils sont implantés en fonction du relief et surtout au voisinage de la mine. Tous ces quartiers sont confinés par le moyen de plusieurs systèmes de séparation naturelle, industrielle (voie de circulation) ou encore par l'éloignement.
  Tous ces axes convergent vers le noyau de la cité ; le bureau de direction et sa placette engendrant subséquemment un plan radioconcentrique.
- **La centralité des activités et l'axialité urbaine :**
  Le village dote d'un axe où se concentrent toutes les activités économiques et administratives. Délimité par la mine au Sud Est, l'axe principal appelé à l'époque « la route du village » suit la voie de chemin de fer. L'animation est d'autant plus grande qu'on s'y rapproche constituant ainsi le cœur de la cité. L'équipement est presque complet. On y trouve l'église, l'hôtel (cantine), le magasin d'alimentation avec une boulangerie et une boucherie, le bureau de poste et le cinéma (destiné à la base pour être un atelier de menuiserie).
  Le bureau de la direction : Avec une façade symétrique, le bâtiment de la direction sous forme de U s'étale sur deux niveaux. Au RDC, un vestibule dessert le bureau du directeur, des ingénieurs et celui du juge. Quant au service comptabilité, il auberge 4 pièces dont le bureau du chef comptable et la caisse.

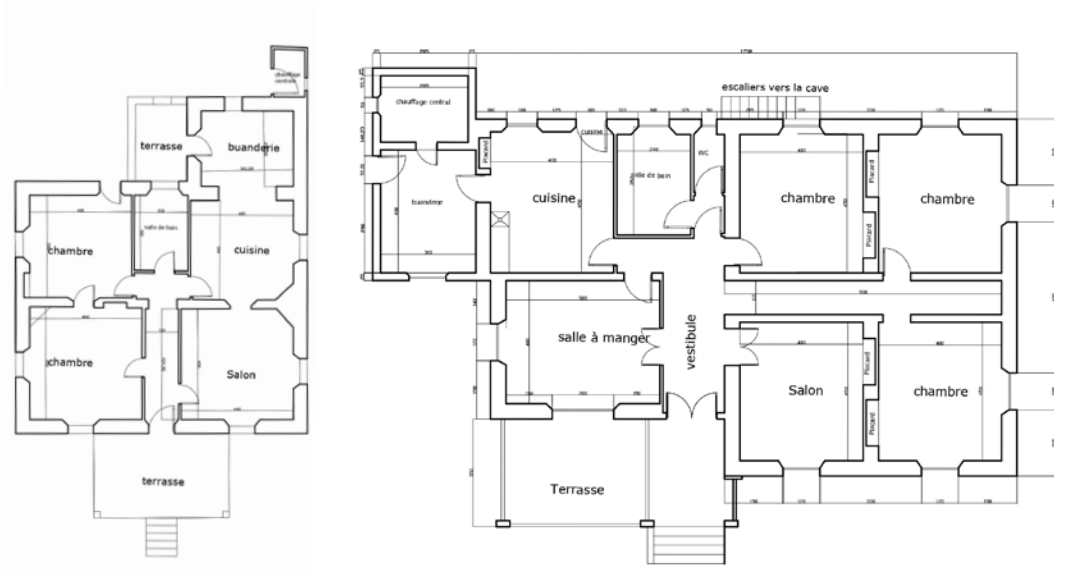
Une galerie distribue les pièces de l'étage à fonction résidentielle. Le bâtiment est un monument classé patrimoine national depuis 2010. Bien entretenu, il garde son aspect originel avec ses fenêtres encadrées en briques polies, son carrelage à ciment comprimé, ses escaliers majestueux en marbre avec une rampe en fer forgé.

L'église Sainte-Barbe : Afin d'assurer un soutien spirituel pour les familles croyantes, nouvellement installées à la Djérissa, on construit en 1919 l'église Sainte-Barbe, icône fédératrice pour les travaux souterrains. C'est la compagnie qui construit le lieu de culte avec le financement de l'investisseur. Elle offre la morphologie d'une chapelle, avec une nef centrale, deux nefs latérales, un chœur, une loge pour le père, un clocher et des vitraux colorés. Après l'indépendance, la paroisse se vide des Européens et le culte s'arrête faute de fidèles. Aujourd'hui l'église garde son allure et ses équipements sauf son clocher.

Le magasin d'alimentation : À usage de vente de produits alimentaires et d'article d'habillement, le magasin abrite une boulangerie avec ses deux fours et son pétrin mécanique, des épiceries, des bonneteries, des bureaux et des entrepôts. La cave abrite des frigos pour la viande et le poisson et un dépôt pour la marchandise. Depuis le début du siècle jusqu'à récemment, le magasin a gardé sa fonction initiale. Inopportunément, pendant la révolution en 2010, il a subi un acte de vandalisme qui a causé la destruction de sa toiture et par conséquent sa fermeture.

- **L'habitat minier :**

  Contrairement à ce qu'on pense de l'image traditionnelle des cités minières, elles se trouvent être d'une grande diversité offrant ainsi des modèles urbains variés. Cette richesse découle de la combinaison de plusieurs éléments de morphologie urbaine qui ne nient, en aucun cas, l'homogénéité architecturale. La hiérarchie professionnelle et ethnique génère, au moyen d'un système de zonage, une ségrégation socio-spatiale. Sur le plan, les différences se manifestent par l'implantation de la parcelle et sa superficie, la présence des jardins et les équipements sanitaires.



1- Villa d'employé
2-Villa d'ingénieur (Village français)
Source : Archives de la direction de la mine de Djerissa. Reproduction personnelle.

Le quartier marocain est un groupe de 5 maisons excentrées, composée chacune de 10 logements d'une seule pièce au RDC dédiée aux ouvriers indigènes célibataires.

Le groupe police est construit pour les fonctionnaires de la police et est composé de 5 maisons d'habitation de 3 ou 4 pièces avec une cuisine et des dépendances.

Le village français est une zone de villas à disposition variée avec un plan quadrillé dominant. Réparti sur deux quartiers : celui des employés et celui des ingénieurs.

Le premier quartier est composé de 18 maisons de 2 ou 3 pièces, une cuisine, des WC, une buanderie en appentis et une terrasse. Le deuxième quartier est composé de 18 maisons dont la surface bâtie de chaque villa dépasse les 200 m^2. Avec une cave et une terrasse, chaque maison est composée de 3 à 5 pièces, des WC, une cuisine et une buanderie en appentis. Ces villas se distinguent par une amélioration du confort et une notion d'intimité bien développée. On essaie d'inonder le bâtiment dans le végétal et la lumière mettant ainsi en valeur les formes urbaines et architecturales variées. On parle alors d'une architecture pittoresque et répétitive.

Le groupe scolaire est un ensemble qui se compose de 2 corps de bâtiment comprenant 4 salles de classe et 4 logements de maitres et se trouve dans la zone du village français. Il est construit pour remplacer la maisonnette qui abritait les espaces d'une école primaire mixte en 1907.

La villa Maurin est la première construction de la compagnie minière et la résidence du directeur général de la mine. Bien qu'elle soit limitrophe des corons européens et

du groupe police, son emplacement sur la plus haute colline lui offre la dominance sur toute la cité. Elle s'étale sur 2 étages, avec des dépendances et un garage.

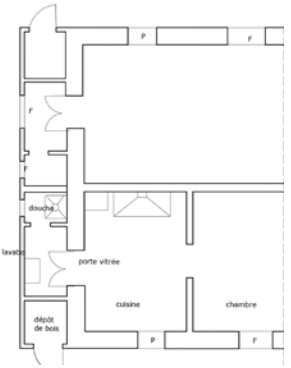
Les corons dessinent une forme urbaine composée d'un groupement de petites maisons ouvrières alignées et conçues de manière économique constituant des habitations unifamiliales étroites, à un étage. Les corons de Djerissa sont des constructions en moellons et chaux avec un carrelage en béton et un enduit en ciment bouchardé. Les fenêtres sont vitrées avec des volets pleins.

On y trouve la petite Sicile qui est un groupement de 12 maisons d'habitation de 3 et 4 logements chacune. Se composant d'une seule pièce et d'une cuisine, la demeure est en RDC avec une terrasse couverte.

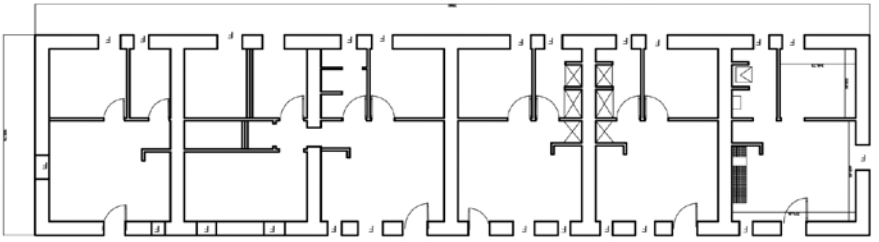
Les corons européens possèdent 2 types de maisons ouvrières. Le premier type abrite 9 maisons d'habitations ouvrières de 6 logements chacune composés d'une ou deux pièces et une cuisine. Le deuxième type couvre 6 maisons ouvrières de 6 logements se composant d'une seule pièce et d'une cuisine.

Le déclin de l'exploitation

Aujourd'hui, la mine continue à être une source d'emploi pour ses habitants. Actuellement, on compte environ 300 ouvriers alors qu'en 1940, le nombre d'employés est évalué à 1217. Suite à la diminution de la production, les travailleurs actuels souffrent à cause de la baisse des salaires. L'exploitation est en déclin du fait de l'épuisement des réserves et la dégradation des matériaux et des engins et de la présence d'une nappe phréatique qui rend l'extraction quasiment impossible. Le carreau comprend une partie en friche et une partie encore fonctionnelle. L'activité se poursuit malgré tout, à un rythme ralenti, vu la bonne qualité de l'hématite vivant dans l'eau. Le déclin de la production de fer a provoqué plusieurs problèmes socio-économiques. On affiche un taux de chômage de 36.17% pour la délégation de Djérissa entre 2009 et 2014 (INS). Le solde migratoire est négatif et correspond à 64%. Ce qui explique la diminution de la population qui quitte la cité minière vers les grandes villes pour acquérir des logements, étudier, travailler et avoir de meilleure condition de vie. Djerissa n'arrive plus à retenir ses habitants malgré son extension dans les directions Nord, Sud et Ouest et avec cette décroissance démographique, les chiffres la caractérisent de ville répulsive. À cet égard, il est impératif d'examiner la dynamique urbaine et socio-économique porteuses de sources d'emplois.



La petite Sicile- Plan type d'une unité d'habitation
Source : Photo : Delcampe.net- plan Archives de la direction de la mine de Djerissa Reproduction personnelle.
Source : Archives de la direction de la mine de Djerissa. Reproduction personnelle.



Maison ouvrière de 6 logements- Type 1- Coron européen.

Conclusion :

L'histoire de Djerissa qui a commencé en 1880, suite à la découverte de ses gisements de fer et à leur acquisition en 1901, confortera les bases du protectorat en Tunisie. La mise en exploitation de ses richesses naturelles par la Société de Djebel Djerissa engendre une cité minière coloniale cosmopolite conçue spatialement, mais aussi socialement. Cette nouvelle forme urbaine change radicalement le paysage rural de la région, peuplée désormais d'ouvriers venus du Maghreb et d'Europe. La croissance démographique a engendré des modèles urbains industriels paternalistes et hiérarchisés, en vigueur aux XIX^{e} et XX^{e} siècles, qui ont persisté jusqu'aujourd'hui pour témoigner d'une histoire unique digne d'une mise en valeur malgré les actualités qui se poursuivent au rythme des crises économiques et des enjeux patrimoniaux. Cet article est une ébauche concernant un site emblématique qui pourrait être un support pour le réemploi architectural raison pour laquelle on a essayé de mener une recherche historique et archiviste accompagnée d'une connaissance du site et d'une documentation.

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DE L'ABANDON À LA VALORISATION: LE NOYAU HISTORIQUE DE TESTOUR ENTRE DYNAMIQUE ET DYSFONCTIONNEMENT

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Restauration de l'horloge de la grande mosquée de Testour; Source: http://www.wepostmag.com/grande-mosquee-de-testour-horloge-a-remonter-temps/.

In this paper, we will focus on the historic city of Testour: a fragile context despite its multiple dimensions. The choice is motivated by its history, its passage through many civilizations, and its heritage features. This town of Moriscan tradition, by its specificity of morphological organization, its socio-spatial movements and the strict use of local materials, offers a great importance study's case to identify the model of preservation and enhancement of its old center despite the dysfunctions from which it suffers as well as the pronounced degradation of components of its old center. To overcome the state of abandonment and deal with various dysfunctions, we will review management tools, as well as actions and development projects envisaged by the various nationals ans internationals actors to preserve its identity and boost a dynamic in this marginal village belonging to a region pushed back despite its potential.

Mots clés: noyau ancien, Testour, abandon, valorisation.

A l'image de nombreuses régions internes de la Méditerranée dans les pays caractérisés par le sous -développement économique, le noyau ancien de Testour «symbole de ce carrefour tunisien entre les bassins Ouest et Est de la méditerranée» (Hamrouni 1999, p. 3) n'échappe pas à la règle. L'abandon progressif, l'émigration et la fragmentation des biens a bel et bien entraîné des problèmes d'architecture et de territoire.

De cette fondation andalouse par les musulmans européens d'Espagne, édifiée sur les vestiges de la *'Tichilla'* subsiste encore un riche patrimoine matériel et immatériel. Notre intervention- basée sur l'étude des aspects d'abandon et de dysfonctionnement des composantes urbaines, architecturales, archéologiques et artistiques de la ville de Testour s'attache à décrire de prime abord l'état de péril ainsi que les facteurs de dégradations du patrimoine urbain et architectural. En effet, nous relevons un état d'abandon prononcé connu actuellement par le centre ancien de Testour,

En s'appuyant sur le potentiel historique et patrimonial de la ville de Testour et plus précisément la richesse et la singularité de son urbanisme et de ses monuments historiques d'influence hispano-andalouse, notre article s'attache à montrer qu'en dépit de l'abandon, de dégradation et de dysfonctionnent relevé, plusieurs acteurs étatiques et associatifs s'attachent par le biais de stratégies et de démarches urbaines à conserver et mettre en valeur l'héritage

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Fig.1
L'évolution urbaine du centre historique de Testour, Source :ZAAFOURI (J.)2020.

Le souk de Testour ; Source : carte et photo ZAAFOURI (J.)2020.

Fig. 2
Place de la grande mosquée de testour ; Source, à droite : photo d'archive ; à gauche : https://tunisie.co/article/9682/region/nord/testour-592709.

historique et culturel de Testour. Notre travail explore le rôle des acteurs nationaux et internationaux. En effet, les acteurs qui animent et mobilisent ce processus créatif sont désormais le ministère de tutelle celui de la culture par le biais des institutions chargées du patrimoine: l'Institut National du Patrimoine (INP), l'Agence de Mise en Valeur et de Promotion du Patrimoine Culturel (AMVPPC). Les associations, la société civile qui se mobilise de plus en plus afin de mieux gérer le patrimoine culturel tunisien, le valoriser et le protéger.

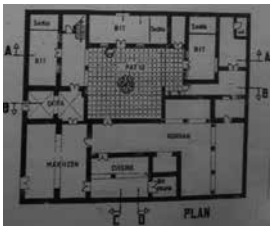
Testour: la ville historique

Testour est une ville du nord-ouest tunisien se situant sur la rive de Medjerda, à 75 km de Tunis et à 30 km du site archéologique de Dougga. Elle est rattachée administrativement au gouvernorat de Béja. La ville de Testour atteint sa plénitude sous les Andalous. Grace à un véritable catalogue urbain et architectural andalous, Testour fait partie des villes tunisiennes témoignant des influences andalouses et morisques de la Tunisie au XVIIème siècle. La région du nord-ouest tunisien est riche en villes témoignant des influences morisques. Nous citons en plus de Testour: Medjaz el Bab, Slouguia, Béja, Téborsouk, Makthar, le noyau historique du Kef.

L'actuelle ville représente l'héritage des différentes civilisations et dynasties qui se sont succédées au pouvoir de Testour, De l'ancienne Tachilla est née Testour, une ville créée en 1609 où les traces des civilisations successives subsistent encore. La première vague des andalous s'est implanté sur les rives de Mejerda formant le premier noyau: quartier des andalous ou Rhibit Al Andalous auquel vient se juxtaposer le quartier des Tagarins par référence à Muhammed Al Thaghari. Le quartier abritant la communauté juive et bien d'autres communautés religieuses ethniques tels que : turcs autochtones et Morisques portent le nom du quartier al Hara. (Fig. 1)

Les traces de ces civilisations restent omniprésentes sur le schéma urbain et les productions architecturales, le centre ancien comprend des équipements cultuels, de loisir, commerciaux.

Ces réalisations s'inscrivent dans un tissu urbain complexe établie sur une logique purement andalous morisque: des ruelles, des impasses, des places et des jardins organisés selon un tracé régulier. La place de la grande mosquée (Fig. 2) est le cœur battant de la ville, elle témoigne de la mixité sociale et architecturale. Nous apprend Ahmed Saadaoui que «La place dans les villes morisques de Tunisie est centripète, point d'aboutissement de l'axe principal» (Saadaoui, 2009, p. 180.)



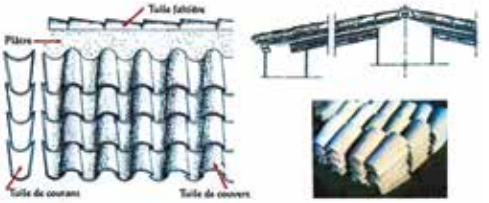


Fig.4
Relevé d'un logement au centre ancien de Testour, Source KHARRAT F. et SAMET N. (1986), p38.

Fig.4
Les tuiles de Testour.

Le tissu traditionnel andalou-morisque de Testour est un tissu régulier, dense et structuré. Les parcelles sont de formes rectangulaires. Le noyau ancien est organisé le long d'un parcours principal (en rouge), d'autres parcours secondaires sont orthogonaux à l'axe principal pour desservir le souk d'artisanat et de commerce. De nos jours, le souk (Fig. 3) compte plus d'une centaine de boutiques traditionnelles larges de 2.20m et longues de 2.80m. les façades des boutiques sont agencées avec des auvents en bois ou en tuiles creuses.

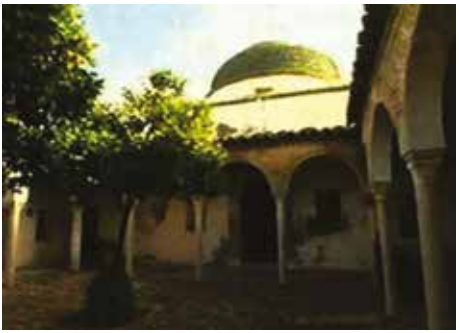
Le principe de la genèse du noyau andalou morisque obéit à une composition par addition successive des maisons groupés et introvertis (dars). Les ilots sont tellement étroits qu'ils ne permettent que deux rangées de maisons s'ouvrent sur deux voies parallèles, toutefois la présence d'une seule demeure s'étalant sur un ilot entier est attestée au noyau ancien de Testour pour les classes sociales très aisée, (Fig. 4)

Les habitations sont couvertes par des tuiles rouges alignées, situées dans les différents quartiers de la Rhiba, des Tagarins et de la Hara (Fig. 5).

Les maisons sont introverties organisés autour d'un patio central auquel on accède par le biais d'une *Squifa*. Sont juxtaposées au patio, bits et *Squifa*, un espace de service qui s'étend sur la moitié de la superficie du logement où on est en présence de cuisine, *bit mouna*, *makhzen*, wc, et *korran*. En effet, aux animaux utilisés dans l'activité agricole est réservée une bonne proportion de la demeure proprement dite. Ainsi, nous affirmons que la production architecturale de l'habitation au sein du noyau ancien témoigne de l'adaptation de la communauté andalouse aux spécificités et données locales. L'importance de l'activité agricole et l'élevage des animaux dans la vie des andalous est traduite par l'imposante proportion du *korran* par rapport au logement au sein du noyau ancien. Elle approuve la structure agraire de Testour.

De nos jours, le tissu traditionnel de Testour concentre deux monuments historiques classés à l'échelle nationale par les services compétents de l'Institut National du Patrimoine depuis le 03 Mars1915 à savoir: la grande mosquée de Testour et la Zaouïa de Sidi Nasr Gharouachi (Fig. 6).

Fig.6
À gauche : La grande mosquée de Testour et à droite : La Zaouïa de Sidi Nasr Gharouachi ; Source :http://islamicart.museumwnf.org/database_item.php?id=monument;isl;tn;-mon01;3;fr http://hamdanereligiontn.blogspot.com/2015/10/testour-mausolee-sidi-nasr-ben-ali.html.



La ville est considérée comme étant un musée à ciel ouvert, outre les monuments historiques classés, elle renferme bien d'autres monuments à intérêts historiques et architecturaux, nous citons par exemple le mausolée du Rebbi Fraji Chaouat, ce dernier atteste de la mixité sociale et le degré d'intégration entre les musulmans et juifs pourchassés d'Andalousie. Nous évoquons également l'ancienne demeure de la célèbre cantatrice et comédienne Habiba Msika (1903-1930), transformée en maison de culture baptisée au nom du saint Ibrahim Riahi.

Testeur: un contexte fragile malgré ses dimensions plurielles

Plusieurs facteurs sont à la base du danger qui guette le noyau historique de Testour et lui cause les dégâts irréparables. Dégradés depuis plusieurs années suite à un processus de transformation social, économique et urbanistique. Bien que lent, ce processus existe et a tendance à défigurer le cachet traditionnel du centre ancien. Ce dernier commence à perdre son caractère authentique, identitaire et témoigne d'une dégradation intensive avec une perte d'harmonie à l'échelle urbaine et architecturale.

Les monuments, les demeures, les legs sont en train de subir des transformations d'usage importante voire même de dégradation et défigurations physiques des bâtiments. Ces changements ont affecté la morphologie et la typologie des bâtiments.

De prime abord, certains dommages sont subis par les aléas du temps, en effet, des facteurs naturels tels que les intempéries, la température et le taux d'hygrométrie sont à la base des phénomènes d'absorption ou bien de désorption engendrant des déformations du bois, des fissures de briques, ainsi que des pathologies pour les tuiles des toitures inclinées, décollement ou effritement du liant en chaux ou en plâtre.

Ensuite, l'inconscience humaine collective est à la base de différents dégâts matériels pour les composantes du noyau ancien de Testour. De prime abord, l'auto-construction au sein de

Fig. 7
Altération du cachet architectural, Source : à gauche : Cliché SAKKA Y. (2018), p.40, à droite : Cliché ZAAFOURI J. (2020).

la médina a défiguré le cachet architectural par le biais de l'introduction des briques et le non usage de la pierre. Ensuite le changement du cachet architectural est dû à l'introduction de nouvelles couleurs, des balcons, du fer forgé.

Ces défigurations sont prononcées sur l'artère principale où les nouvelles constructions en briques rouges viennent se superposer aux constructions identitaires et conservés. En effet, le remplacement qui se fait de nos jours des couvertures des boutiques des commerçants en tuiles creuses avec un seul versant par des dalles en béton armé (Fig. 8) nuit au paysage urbain paysager et architectural du tissu ancien. La maitrise de la technique de fabrication des tuiles andalouses est malheureusement en voie de disparition.

A son tour, La transmission de l'héritage au sein du noyau ancien a aggravé la gestion des demeures, en effet, les héritiers en abandonnant, durant de longues années, les travaux d'entretien, de conservation et de réparation de leurs biens, ont contribué à l'état de délabrement et de menace ruine.

Enfin, il est important de signaler que le départ excessif des originaires de Testour pendant les années 60 a engendré le dépeuplement du centre historique. La désappropriation de ce patrimoine s'est accentuée par les nouveaux occupants locataires.

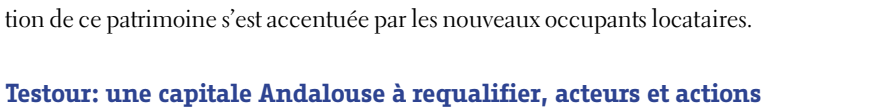


Fig. 8
Défigurations sur l'artère principale :Source, à gauche :Cliché SAKKA Y. (2018), p.40 ;à droite https://www.gettyimages.fr/detail/photo-d%27actualit%C3%A9/the-minaret-of-the-grande-mosquee-of-testour-on-photo-dactualit%C3%A9/901899096.

Testour: une capitale Andalouse à requalifier, acteurs et actions

La politique de sauvegarde et de la mise en valeur de la ville de Testour à impliqué directement l'état Tunisien, représenté par le ministère de la Culture et de sauvegarde du patrimoine à travers l'institut du patrimoine (INP) et l'agence de mise en valeur du patrimoine et de promotion culturelle (AMVPPC).

Le dispositif existant en Tunisie en matière de sauvegarde du patrimoine urbain fait référence à la loi n° 94-35 du 24 février 1994, relative au code du patrimoine archéologique, historique et des arts traditionnels tunisiens. Le code du patrimoine définit les sites culturels, les ensembles historiques et traditionnels et les monuments historiques classés ainsi

que leurs abords. Selon la même loi, les sites culturels et les ensembles historiques et traditionnels, après classement et délimitation de leurs périmètres, feront l'objet d'institution par décret respectivement soit d'un plan de protection et de mise en valeur (PPMV) soit d'un plan de sauvegarde et mise en valeur (PSMV).

En absence d'un PSMV pour l'ensemble traditionnel de Testour, la gestion du secteur sauvegardé se fait actuellement par le décret relatif au plan d'aménagement urbain (PAU) de Testour promulgué depuis 2009. Rappelons que le PAU représente un outil de planification urbaine et non de protection et de valorisation du patrimoine. La détérioration du centre historique est due, entre autres, à l'absence d'un outil juridique de gestion approprié.

Pour faire face aux dégradations et délabrements subis, des actions entreprises par différents acteurs qui se sont mobilisés soit à l'échelle nationale soit celle internationale. Parmi les acteurs locaux, la CPL de Testour, l'ASM de Testour, les citoyens et la société civile. D'autres études et actions ont été entreprises par l'AECID «Agence espagnole de coopération internationale et du développement» ainsi que par le Goethe-Institut.

Il s'agit d'un projet qui s'appuie sur le potentiel historique, patrimonial et identitaire et ayant pour objectif le développement d'un produit culturel et touristique. Il s'est lancé en 2009 par le ministère de la culture et de la sauvegarde du patrimoine (l'INP et l'AMVPPC) avec l'appui financier de l'Agence Espagnole de Coopération Internationale pour le Développement (AECID). Ce projet comptait aussi sur la participation du tourisme, environnement et artisanat. Entre autres les composantes du projet nous apprennent que: «la récupération et la revalorisation des métiers traditionnels, la dynamisation du patrimoine immatériel, le réaménagement des espaces publics et monument du centre historique par la signalétique, la réhabilitation des principaux bâtiments et la création d'un centre d'accueil (café des andalous)» (Tomé Virseda, Carmagnolle 2011, p. 38).

Dans le cadre de la valorisation-restauration et la mise en valeur de la ville de Testour à travers ses monuments historiques, la grande mosquée de Testour a subi des travaux de restauration,

sous sa direction de l'INP. Entre autres les travaux réalisés, nous citons la reprise des toitures de la Grande Mosquée, bâtie en 1610 et de sa salle de prière, ces travaux ont été exécutés, dans le respect total des techniques constructives et des matériaux locaux.

Dans le cadre du projet tuniso-allemand "Le patrimoine architectural en Tunisie", fut lancé en 2012, avec le concours de l'Institut Goethe en Tunisie et la municipalité de Testour les travaux de restauration de l'horloge (Fig.9). Unique dans le monde, -suite à panne qui a duré trois siècles- sa restauration a nécessité un montant total environ10 mille dinars. En Novembre 2014, les aiguilles de l'horloge du Minaret de la Grande mosquée de Testour ont tourné de nouveau dans le sens contraire des aiguilles d'une montre grâce à cette intervention.

COOLWART est un collectif d jeunes cinéastes œuvrant dans la communication et la production audiovisuelle axé sur l'art social. Leur projet vise à la sauvegarde du patrimoine andalou de Testour. Le projet Coolwart pour la sauvegarde du patrimoine de Testour a vu le jour suite à la production en 2015 d'un film documentaire. Ce dernier portait sur les tuiles andalouses de Testour où figure le témoignage de Mohamed Manai, le dernier artisan de la ville de tuile traditionnelle. Ce projet est à l'origine d'une action sociale culturelle dont l'objectif est la formation des jeunes de la région dans la fabrication des tuiles andalouses et des briques pleines. Cette initiative a un caractère patrimonial, culturel, social et économique. En effet, on apprend aux jeunes le processus de création et de gestion d'entreprise dans le but de créer un GDIE (Groupement de Développement à Intérêts Economiques). Ce projet a vu le jour grâce au soutien de l'Ambassade de Suisse en Tunisie et en collaboration avec l'Association de la Sauvegarde de la Médina de Testour (ASMT),

De récentes études continuent toujours pour mettre en valeur le patrimoine matériel et immatériel de Testour, nous évoquons le projet environnemental, économique et social prévue vers la fin 2020, en partenariat avec les villes françaises de Lescar et de Pau (Sud-est de la France), nous apprend Mensi, maire de Testour, En effet, le projet s'articule autour la création d'un centre de tri et de valorisation des déchets et d'aménagement des routes communales dont, notamment, celles autour des sites historiques, en vue d'une ville propre, attractive et d'un développement durable.

Conclusion

L'ensemble historique de Testour présente un grand potentiel qui la rend particulièrement adaptée pour une requalification patrimoniale, urbaine et architecturale. Afin de regagner l'attractivité du noyau ancien de Testour. Deux échelles d'interventions

s'avèrent important à distinguer : une échelle locale et une nationale. A l'échelle locale, la collectivité publique locale a peu de prise sur les transformations informelles subites par le centre ancien.

A l'échelle nationale, les grandes opérations d'urbanisme reposent sur la valorisation du tissu intramuros de Testour. Cette dernière n'est qu'une étape qui devrait être appuyée par une valorisation de son environnement immédiat, c'est à dire des territoires urbains à proximité. C'est plutôt la question du marketing territorial qui devrait être posée afin que l'ensemble traditionnel de Testour regagne son attractivité.

Différentes interventions ayant pour objectifs d'instaurer une mise en valeur du potentiel patrimonial et culturel avec des retombées positifs sur les plans économique et touristiques.

Cependant loin de répondre aux problématiques urbaines architecturale sociale et économique du centre historique, loin de satisfaire les besoins des habitants de la médina, les efforts de conservation et de sauvegarde restent en deçà des besoins de Testour.

De nouvelles approches de préservation et de mise en valeur du patrimoine qui s'appuient sur l'innovation et l'utilisation des technologies nouvelles pourront conduire à une préservation et mise en valeur des noyaux anciens en général et celui de Testour en particulier ainsi vers la construction de nouvelles potentialités territoriales. «Il est important de mettre en place un site internet dédié aux questions du patrimoine, accessible aux chercheurs, étudiants, associations, professionnels, propriétaires…etc. pour diffusion, vulgarisation des informations et recueil de suggestions» (Lesbet 2019, p. 19).

En guise de conclusion, le rôle du patrimoine de Testour s'avère primordial afin de favoriser et conditionner le développement local et touristique de la ville et de la région du nord-ouest Tunisien en général. La préservation de son identité et l'impulsion d'une dynamique dans ce village en marge appartenant à une région repoussée est faisable en s'appuyant sur son potentiel et richesses culturelles.

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International Fairground of Lebanon in Tripoli
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A MODERN NEIGHBORHOOD FOR PROSPERITY. THE CASE OF THE INTERNATIONAL AND PERMANENT FAIR OF LEBANON IN TRIPOLI BY OSCAR NIEMEYER

Joe Zaatar
Politecnico di Milano-Italia

The elliptical site of the Fair between Tripoli and El-Mina (© Google Earth Pro 10/2020).

In 1962 and following his great accomplishment in Brasilia, Oscar Niemeyer was officially invited to design the International and Permanent Fair of Lebanon in Tripoli. Back then, the idea of modernization emerged from President Fouad Chehab was meant to strengthen the territory and inhabitants. The nearly completed Fair that spread over 756.000 square meters in a prominent location is now falling to pieces. The complex architecture in reinforced concrete that was designed and built, represents an era and a vision that existed in this part of the world. Today, Lebanon is hosting a significant number of displaced refugees and going through an economic crisis, a devaluation of its currency, a popular revolution, and the Covid-19 pandemic that reared its ugly head in Lebanon in the first quarter of 2020. Things even got worst on the 4th of August with the catastrophic explosion that stunned the Lebanese capital of Beirut and inflicted damages beyond imagination. In the city of Tripoli, while we are witnessing an unprecedented increase in poverty and hostility between neighborhoods, we ask if this unique modernist neighborhood can be part of solutions for an equitable distribution of wealth and conviviality among stakeholders. What could be done with this particular neighborhood in this social, political and economic context?

Keywords: Lebanon, Tripoli, Modernism, Development, Neighborhood

The name Tripoli came from the Latin Tri Polis, which refers to three quarters separated by defensive walls and hosting three different settled populations (Bearman, 2000). Tripoli is a historic town of the Mediterranean coast in the Levant, actual Lebanon. Under the Ottoman Empire that lasted over 400 years, it was an important chief town called Elayet (Governorate) with its active port of El-Mina. In the 19th century, before the end of the Ottoman period and during the new age of westernization, the town was downgraded to a Sanjak center under the Vilayet of the modern Beirut. The new town retained this status until the British forces took the Levant in 1918. A year later, the transfer of power to the French led to the creation of the State with extended frontiers under the name of Greater Lebanon. The city of Beirut situated at 85 km south of Tripoli was its capital.

In 1943, Lebanon became independent in the so-called modern period. In the early 1950s, the capital Beirut was open to progress due to exchanges with other similar cities (Kassir, 2003). The city looked modern and eager to greet new developments. It had started to fill

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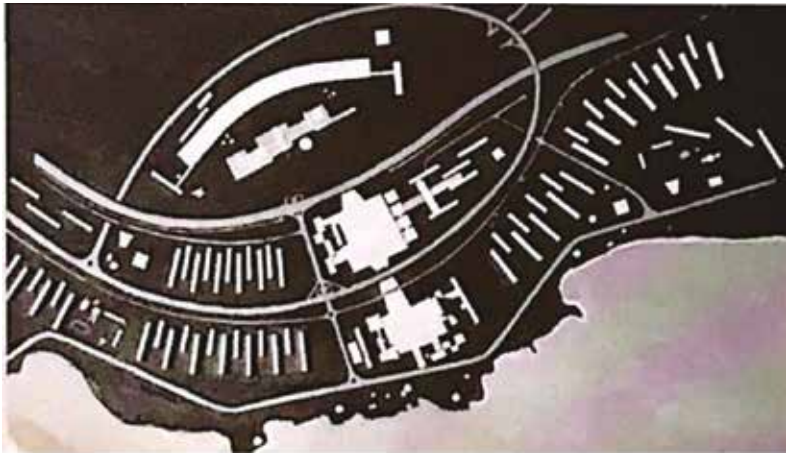

The study model by Guy L. Dimanche (collaborator of Oscar Niemeyer) in 1962 (© Architecture d'Aujourd'hui, N°105, 1963, p. 96).

empty spaces with modern, imported, and indigenous architecture. Due to rural migration, the big city of Beirut and Tripoli (at the north) were growing without any well-thought urban planning. During his mandate from 1958 until 1964, President Fouad Chehab wanted to create a nation-state by implementing strong controls on the territory and its development. The region of central Lebanon with its capital Beirut enjoyed a privileged position compared to the urban and rural "suffering" zones on the north, east, and south. In 1959, Louis-Joseph Lebret, director of the largest public research organization in France and the IRFED[1] was engaged to assist the President in the study of the territory and population. Lebret had a humanistic approach to the subject as he wrote it down in the introduction of his report: "…le développement doit être intégral c'est-à-dire de tout l'homme et de tous les hommes…" (Lebret, 1960). The main work was to provide an overall orientation for the Lebanese economy with a view to long-term economic development and social justice. The study was subject to the scrutiny of authorities and officials as an effective instrument in the development of "a prosperous and radiant Lebanon". Accurate research was needed for Lebanon's entry into the international development culture. Similar to Professor François Perroux and fellow Giorgio Ceriani Sebregondi, Lebret believed in a development that is no longer just economic, but also institutional, social, and cultural. This progress took on the characteristics of a process that is no longer only for the Western world, but for the whole planet, in a track that unknots up to the development of the people.

[1] Known as International Center for Development and Civilizations.

To plan the growth, President Chehab needed many experts. Back then, the French Lebret noticed that the human rights in Lebanon were absolute and no discipline had decisive value. The general framework of the country was made of societies within families (as clans) or political groups (nationalism versus Arabism, and cold war). Characterized by individualism, it obstructed collective life by the absence of collaboration. Moreover, the invited Europeans experts came usually from a rational and disciplined world. Their concepts, theories, and methods did not apply to a radical individual and liberal society that used to consider every constraint as injustice. These experts invited to design, draw, trace, plan, and recommend what is valid, could not do it without the state's intervention. Therefore, the operation had a huge concern to resolve the issues, which prevented the formation of a fraternal feeling between the Lebanese. Lebret was sure that only the state was able to put in place the fundamental infrastructures at a fast pace and lowest possible cost. Only the state, through coordinated objective measures, could lay the development foundations for the planning. The admiration for this difficult task was needed from everyone, even if this state had deficiencies, inexperience, and internal oppositions (Lebret, 1960).

The lack of statistical documentation and comprehensive studies were a major difficulty for Lebret's investigation and mission, both for the conduct of the surveys and for the pursuit of general studies. However, he accepted the assignment and signed the contract on October 23, 1959. President Chehab was challenged in creating a national cohesion between the different people of his young nation. He was focused on how to develop a civic sense in citizens who belonged to various religions, social classes, had different origins and political views. He felt that trust in the state could be built progressively if people from various demographics felt to be largely recipients of the national economic solidarity. For this reason, Chehab reviewed the structure of national income and reconsidered the distribution of the state resources.

In the 1960s, economic, social, administrative, and cultural development for Lebret was only possible through human development. Development had to enhance the value of all subgroups of the population, which intended to integrate technical progress into its life while at the same time intensify its proper human quality. The first work of IRFED in Lebanon could only be a comparative study of living standards between different regions, the secondary poles, the cities, and their neighborhoods. In 1960, North Lebanon was rich in agriculture but suffered from poor water, electricity, road, and communications infrastructure, especially in its most remote areas. For instance, the route connecting the North region to Beirut was built in 1909. The North region was one of the four regions that significantly lagged behind. Lebret classified it in category B which corresponds to under-development, with a general

average of living standards below 1,5[2]. The analysis method used for the capital of this region was a view of its social structure in many neighborhoods, ranging from poor to more affluent communities. Back then, the Fair was an idea in the mind of the President and his cabinet; he was still formulating the laws[3], decrees, councils, and Ministries to build the structure that will support its creation and management. The expropriation of the lands would start in 1961.

In Tripoli, the careful survey of Lebret focused on five districts chosen according to the differences in their social strata:

1. The district of Moutran is predominantly affluent.
2. The old city center comprises 40% to 50% of the middle and working class.
3. The Bab al-Tebbane neighborhood is comprised of 90% of the working class.
4. Baal Saraqbe (today is known as Jabal Mohsen) is represented by 10% of low-income families.
5. El-Mina represented a mixed population, 30% of the middle, and 60% of the popular class.

None of the districts was adjacent to the orange groves between Tripoli and El-Mina. The site of the Fairground was going to replace the fertile citrus plains that existed even before 1906[4] (Jidejian, 2006). Baal Saraqbe neighborhood was built around orthogonal streets with residential buildings hosting few commercial activities. Bab al-Tebbane and Baal Saraqbe were centers of migrants, mainly Palestinians and Alawi. Lebret mentions evident deficient factors in the habitat of these two neighborhoods. He wrote: ānumerous unhealthy sources of contamination, like stagnant water, garbage dumps, and precarious toilets. The elevated number of housing in Baal Saraqbe inflicts inhuman promiscuity, with poorly ventilated units that have insufficient sun exposure, and are minimally equipped with water and sanitation facilities. In Bab al-Tebbane the habitat although more recent, showed an overall deficient level, such as a multiplicity of sources of contamination formed in particular by deposits of garbage and precarious toilets. Made of popular housing in its great majority, it forces certain promiscuity and unhealthy sanitary equipment. Despite the proximity to the old city center, there is a total absence of a pluvial network, parking, public places, green spaces, and a scarcity of police officers… The

[2] Mission IRFED LIBAN 1960 classifications: average < 1.0 corresponded to non-development. Average < 1,5 corresponded to under-development. Average < 2.0 corresponded to partial under-development. Average between 2.0 and 2.5 corresponded to developing. Average > 2.5 corresponded to advanced development. Archives Phoenix U.S.E.K. Liban.

[3] Law 4027/1960 implemented by decree.

[4] In 1906, during the Late Ottoman period, the German Karl Baedeker published the cartography of Tripoli and El-Mina revealing the "orangers" plains in the middle of both towns.

old city center dating from around 1650 retains a ruined character, with old, dirty, lively, and noisy souks and two-story buildings that lean against one another. The habitat also showed deficiencies in terms of the available space per person, which rarely exceeds eight square meters. In addition, the installation of sanitary facilities was generally primitive. In El-Mina, the habitat with three hundred years dwellings is between the port and the boulevard Port Saïd. Even with sufficient available space to build, due to the high number of people per family, the number of square meters occupied on average per person rarely exceeds eight. The protection of the facades and the roof is missing and the sanitary installation is generally defective. Finally, Moutran district was the place of exclusive residences of foreigners, diplomats, and wealthy people. The habitat was excellent even in the new modern stores." (Lebret, 1960).

The very great disparity between the working-class and low-income classes on the one hand and the middle strata, on the other hand, turns out to be extremely evident in Tripoli. The habitat was an issue for all three classes, and its repercussions from personal hygiene, cleanliness, care, and nutrition-safety were extremely relevant to the inhabitants' life. After the accurate studies that took into account the real conditions and needs of all social classes, the existing idea of a Fairground merged with a middle-class mass housing plan was blooming. A neighborhood for the prosperity of the citizens of Tripoli, the second biggest city in Lebanon, was becoming a priority in the presidential agenda.

In October 1961, the Lebanese President received a presidential brochure from his Brazilian homologue Juscelino Kubitschek about the inauguration of the modern capital Brasilia. A series of pictures in black and white showed the before and after but also the acclamation of the crowd for this great accomplishment. At that point, President Chehab and his government reaction to urban vulnerability was through scientific analysis, justice and fair distribution of wealth, and technical intervention in the expression of that time. Modernism in architecture was associated with ideal visions of human life and the belief in progress. For Chehab the innovation was well timed at one point in the social and technological evolution of the country, and it responded to the needs of the population. In 1962, the modernist Brazilian architect Oscar Niemeyer was invited officially to design in loco[5] the International and Permanent Fair of Lebanon in Tripoli. In his first proposal, he envisioned to start the project from the seacoast toward the orange groves, or vice versa. He came out with a combination of poetic buildings for the Fair, inspired from a Wassily Kandinsky abstract drawing, 60 middle-class mass housing, and annexed services and infrastructures for the circulation (see

[5] Oscar Niemeyer came for the first time by boat to Lebanon from 24 July until mid-September 1962.

image 1). Niemeyer established a hierarchy within the lines of circulation, the center for the Fairground, and the west side a radial organization for the residential sticks immersed in the vast landscape. The Fair remained more or less in the same initial location but the housing development was completely omitted in the second phase. This might have happened most probably for budget reasons or found rejection from some counterparts (such as the order of engineers and architects). In October 1963, the first stone was laid down and works were meant to end by 1966, and then postponed to 1967. After that, the date for inaugurating the Fair was targeted to spring 1969 at the first stage, and a second period to 1976. Without a doubt, we know an inauguration year was never reached due to the war.

Like other previous modernist and modern projects in Lebanon, the Fair represents the language and beliefs of modernism. Designed by the famous Brazilian architect Oscar Niemeyer and realized with the expertise of local engineers, the result is a variation obsessively faithful to the original concepts. Oscar Niemeyer used to interact with structural engineers like Joaquim Cardozo, and he found the same experts in Lebanon. Dr. Nazih Taleb used to sit for hours with him in his office in Verdun Beirut to discuss engineering issues and theories. The architect did not have to bring his engineers from Brazil. I wonder if this project can be slightly considered as autochthonous; designed and built by Oscar Niemeyer with the assistance of local engineers[6].

Today, the nearly completed Fair spread over 756.000 square meters (see image 2) is still falling apart. This complex architecture built in reinforced concrete was almost completed and ready for inauguration in 1976. It represents an era of optimism (answers to important questions) that existed in this delicate part of the world. The long war from 1975 until 1989 had stopped its inauguration, use, and worsened its original condition. After 1994, when the Fair stopped being a military barrack, some catalog books of exhibitions in Europe and Lebanon re-mentioned its existence and opened the debate toward the intellectuals. Since 2005, the Fair is in the list of World Monuments Watch. In 2007, at the centenary of the living legend architect Niemeyer, particular attention from the Media brought to light the Fair and the mystery behind it. It became an attraction for western tourists, an opportunity for local and foreigner speculators, and even a place to raise some extra cash for its few employees. In 2016, The European Commission funded a project to support the carpentry private sector in Lebanon as a non-profit initiative inaugurated in 2018. In 2018, UNESCO had the site for nomination for the World Heritage list. The

[6] Dar Al-Handassah Consulting Engineers, Associated Consultants Engineers, and Bureau d'études techniques Noel AbouHamad. DAR AL-HANDASAH (Nazih Taleb & Partners) replaced the first firm after 1971.

same year, The Getty foundation with UNESCO Regional Bureau started financing a group of professionals from the U.S.A. and Lebanon to study "a general conservation policy to (…) develop the guiding policies that preserve what is significant about the Fairground, (…) and identify possible adaptive reuse strategies towards the compatible development of the Fairground"[7]. Until now, their work remains in progress. Today, the work on the Fair is still on hold and every year the funds from its custodian[8] decrease. It is not open to the public.

In October 2019, the American sanctions on Syria followed by the collapse of the Lebanese economy, with its banks seizing the savings of the clients under the endorsement of the Government(s), have stimulated people to protest in the streets. The revolution, known as thawra in Arabic, has been calling loud from Beirut and Tripoli (gaining the name of the bride of the revolution) for the resignation of all politicians. It is composed of the middle and working classes fed up with corruption and patronage. They claim a drastic change in the ruling class composed of war leaders and followers. In 2020, the leader of the Party of God H. Nasrallah invited the Lebanese to "industrial and agricultural Jihad… and to look at the East". Admittedly, the supporters of his cause will follow his ideological message, but doubts arise among the rest of the people. Indeed, following this call, things worsened economically, even more, confidence no longer exists among various Lebanese and external fronts. Neither did the East provide financial aid nor were the Lebanese able to reconnect with the West, creating an impasse in any physical, material, and monetary exchange. The slight growing local production at new prices, quadrupled or even quintupled, which has demonstrated flaws in the country's system. Added to this, the Covid-19 health crisis makes the daily life of residents heavy to bear. On August 4, 2020, the explosion at the port of Beirut of the most powerful non-nuclear blast in history placed the country on its knees in the indifference of its ruling class.

In Lebanon, we are witnessing an increase in poverty, and the situation in Tripoli is directly affected. Could the Fair be part of the stakeholder's requirements (the one of the revolution) for more state services and major conviviality among multiple identities? To alleviate the pain could there be more?

Looking today at the distribution of Niemeyer's architecture in the elliptical masterplan, it seems an avant-garde idea that fits in the global pandemic. The distribution of the 17 buildings with these cosmic dimensions and large green areas in between can be suitable for the distancing strategy to fight Covid-19. This unique neighborhood has enough space to receive thousands of visitors with appropriate distancing, both indoor and outdoor. The Fairground,

[7] From Unesco.org
[8] Ministry of Economy and Trade of the Republic of Lebanon.

open to the city, would provide public spaces, non-existing in other neighborhoods, to host a considerable number of citizens if they stick to the Covid-19 pandemic restrictions. Most of the Fair's abandoned buildings, being from the international style of architecture, reveal certain flexibility. So they are adapt to host new functions, complementary to the exhibition. Some utilities from the 17 sustainable development goals could be suitable for its reuse. The list starts with No Poverty, Zero Hunger, Good Health and Well-being, Quality Education, Gender Equality, Clean Water and Sanitation, Affordable and Clean Energy, Decent Work and Economic Growth, Industry, Innovation and Infrastructure, Reducing Inequality, Sustainable Cities and Communities, Responsible Consumption and Production, Climate Action, Life Below Water, Life On Land, Peace, Justice, and Strong Institutions, and ends with Partnerships for the Goals. The objectives highlighted in bold can find easily a placement in the Fair to serve the citizen's requests.
The majority of the Fair's buildings in reinforced concrete created more than 55 years ago is suffering decay and poor maintenance. Only Conserving Concrete Heritage Experts should be the ones to intervene (noninvasively) to return it safe and bring it to its original shape. This neighborhood was made to become the place for Tripolitans, Lebanese, and all foreign-persons together. The antithesis of all that came after Chehab's mandate to feed personal, internal, and external political interests. The Fair representing rationality, justice, and progress for Lebanon was attacked for years, as the Lebanese people. It is their exact image protesting in the streets against oppression. The Fair is their Cultural Heritage. The people have the right to reclaim it and make it a living sustainable organism for the first time. Only actions coming from the ones who act fairly would save this modern Heritage.

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L'ARCHITECTURE DES VILLAGES RURAUX EN ARMÉNIE CENTRALE : RELEVÉS ET INTERVENTIONS POUR UNE STRATÉGIE DE DÉVELOPPEMENT DURABLE

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Università degli Studi di Firenze-Italia

Masterplan du projet de la manufacture de traitement du mûrier à Yegheghis. Pasquini, 2020.

The project explores the issue of villages and neighborhoods at risk of abandonment, focusing on the rural villages of central Armenia, in the internal region named 'Vayots Dzor'.
This reading highlights the study of a territory and its architectures, aiming to propose some potential sustainable development strategies respecting the local tradition and facing the most recent phenomena of abandonment that hit the territory. The output of this work is part of the university research mission promoted by the School of Architecture DIDA and the Faculty of Archaeology of the University of Florence SAGAS. The research is focused on the medieval architecture in Vayots Dzor region, developing both archaeological works and architectural drawings obtained from surveys.
In this paper, we propose the study and the analyses of the territory and the architectures of Yegheghis, a village in Vayots Dzor. In the first part, we explain the ancient history of this place to better know its current structure and to understand the reasons of this recent phenomena of migration. It shows the village's architectural and urban characteristics and analysis obtained through the architectural surveys we made. The final aim is to achieve the architectural local knowledge to suggest some possible strategies of safeguard, restoration and revitalization of these places, giving them the tools to develop their own local autonomy improving the work' and study' possibilities, thanks to a land management based on the concept of sustainable development.

Mots clefs : Arménie, villages ruraux, relevés, développement durable, stratégie de valorisation

Introduction

On contribue au débat sur la problématique des villages à risque d'abandon en présentant l'étude des villages arméniens, en particulier les villages de la région centrale Vayots Dzor. On propose avec cette lecture l'étude d'un territoire et ses architectures, analysées et relevées afin de proposer des potentielles et plausibles stratégies de développement durable conformément à la tradition locale, en mettant ainsi un frein aux phénomènes d'abandon les plus récents qui ont touché le territoire. Il est précisé que le travail présenté ici naît à l'intérieur de la mission de recherche promue par le Département d'Architecture DIDA et la Faculté d'Archéologie de l'Université de Florence SAGAS [1]. La recherche, commencée en

[1] La mission de recherche "Silk Road", active depuis 2014, est promue par la faculté d'archéologie SAGAS de l'Université de Florence, avec pour responsable Michele Nucciotti. La recherche voit la collaboration du département d'Architecture DIDA de l'Université de Florence à travers un group de recherche avec pour responsable

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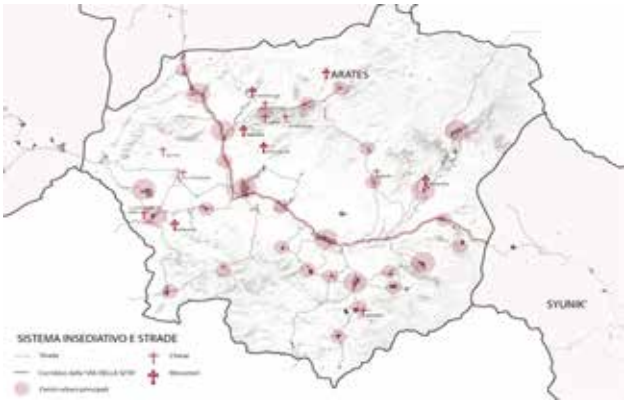


Le Vayots Dzor et ses frontières. On évidence le système d'implantation et infrastructurel. Vezzi, 2020.

Cartographie du territoire de la région Vayots Dzor. On évidence l'hydrographie, les voies de communication, les noyaux urbains, les églises médiévales. Vezzi, 2020.

2014 et toujours active, intéresse les architectures médiévales qui traversent le territoire de la Vayots Dzor, en associant au travail archéologique une importante rédaction de graphiques architecturaux obtenus à travers des campagnes de relevé. Un type de collaboration interdisciplinaire et internationale qui a guidé la recherche dans le temps jusqu'à l'étude d'un territoire avec un important passé historique et à l'étude de ses anciennes architectures cachées. Ce qu'on propose est l'étude et l'analyse d'un des aspects qui caractérise ces villages, c'est-à-dire un état d'immobilisme évident qui, aggravé par les récents phénomènes de métropolisation, pousse les villages vers un progressif dépeuplement.

Context historique et géographique du territoire

Pour entrer dans le débat et avant d'analyser le phénomène d'abandon dans les villages arméniens, il faut ouvrir une brève parenthèse pour encadrer géographiquement et historiquement ce territoire et ses particularités. La région Vayots Dzor, au sud du lac Sevan, est composée par un territoire rural, caractérisé par les montagnes rouges du Caucase et des terres riches en ressources naturelles, exploitées par les habitants de ces lieux pour l'agriculture et l'élevage de subsistance, grâce aussi à la présence du fleuve Arpa et de ses nombreux affluents qui caractérisent géographiquement la province.

Cartographie du village de Yegheghis. Relevé urbain. Pasquini, 2020.

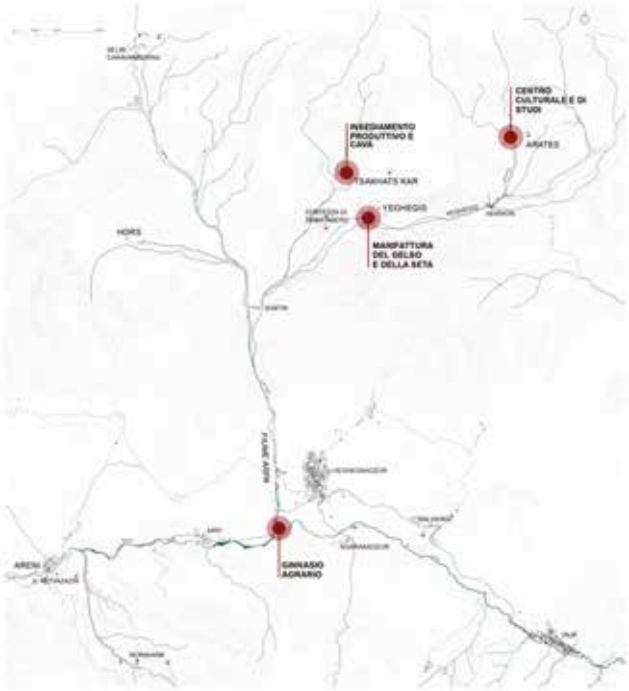
A' confirmation du caractère agricole de cette zone, les villages qui se rencontrent le long des routes et qui occupent les vallées le long de la rivière Arpa et ses affluents, ont des connotations rurales. Malgré le tourisme qui a envahi ces dernières années des régions

inexplorées comme celle-ci ait déclenché une brusque et inexpérimentée tentative d'accueil (en risquant une exploitation du territoire sans d'abord le protéger et le développer durablement), les villages de l'Arménie centrale sont encore structurés avec les caractéristiques architecturalement archétypales.

La dimension rurale des villages, et plus généralement la sphère agricole ancrée à une architecture et une infrastructure pas développées, semble être le résultat de l'histoire du lieu dont les racines plongent loin dans le temps. On se demande enfaite d'où il vient cette situation, comparée à la richesse de l'histoire d'un territoire qui fut le Royaume d'Arménie.

En effet, les villes arméniennes, comme celles qui se rencontrent dans la région de Vayots Dzor, se montrent comme un reflet direct de l'histoire qui y a vécu toute la population[2]. Elles

[2] Pour mieux comprendre le rapport entre population et territoire, on rappelle que l'Arménie a une population de 2 974 693, dont 1 093 485 habitent dans la capitale Erevan. La densité de population dans tout l'état est de 101.5 ab/



Cartographie de la Vayots Dzor, en soulignant les sites de projet.

Masterplan du projet d'intervention sur le territoire du fleuve Arpa. Prodi, 2018.

se présentent à nous comme des lieux "coincés" dans un temps passé, auquel n'a jamais succédé un développement de croissance (qu'elle soit technologique, économique, ou infrastructurelle), mais plutôt un progressif phénomène d'abandon qui a poussé une partie de la population à migrer vers la capitale. Les siècles de domination que la population arménienne a subie, des anciennes dominations sassanides jusqu'aux plus récentes soviétiques, ont empêché à cet État de développer sa propre indépendance sinon à partir des trente dernières années, où, en déclarant son indépendance à l'URSS en 1990, celle-ci lui est officiellement reconnue seulement un an plus tard. Dans le dernier siècle de domination sous le contrôle de l'Union des Républiques Socialistes Soviétiques, la politique d'aménagement du territoire visant au développement industriel a appliqué des planifications et des projets de transformation du territoire : des plans d'urbanisation de la capitale actuelle (voir le projet de l'architecte A. Temanyan) à la réalisation des travaux d'infrastructure dans tout l'état (routes, viaducs, méthanoducs, barrages, centrales hydroélectriques, etc.).

km2, par contre la densité de population seulement dans la capitale est de 4 903,52 ab/km2.

Si dans un côté cette politique a conduit à une période de développement territorial, dans l'autre côté il a coupé de ce système toutes les réalités périphériques qui ne constituaient pas une ressource potentielle pour le pays. Cela a nécessairement creusé l'écart, déjà existant, entre les villages ruraux et la capitale. Dans ce contexte, on peut mieux comprendre les récents phénomènes de migration qui voient la capitale comme un modèle de plus en plus occidentalisé et moderne, et de plus en plus éloigné des situations locales qui s'y trouvent en dehors. Après avoir brièvement décrit le contexte qui accompagne les processus d'urbanisation arménienne, on explore à travers l'analyse et les relevés des villages la mémoire qui les lie au territoire.

L'urbanisation de la region Vayots Dzor

Aujourd'hui, les villages sont habités par une partie de la population et ils constellent le territoire le long des anciennes voies de commerce ou dans des points stratégiques, souvenirs d'un temps riche et florissant, à témoignage qu'un sens implicite et loin de l'identité d'appartenance n'est jamais abandonné du tout.

A cet égard, la recherche est partie du relevé et de l'analyse territoriale, en mettant en relation les villages étudiés avec l'urbanisation du territoire dans ses époques les plus florissantes, C'est le cas des anciennes voies de communication et de leurs caravansérails, qui faisaient de l'Arménie un territoire équipé d'échanges et de commerce.

La Route de la Soie, principale voie de commerce traversant l'État, semble être l'élément fondateur de la naissance des différents centres urbains de la région Vayots Dzor, et malgré la configuration actuelle, leur position stratégique n'est pas oubliée par certaines architectures médiévales de type religieux qui constituent le patrimoine historique arménien, laissant des traces évidentes du passé historique du lieu.

En témoignage de l'identité culturelle et du sentiment d'appartenance que les citoyens nourrissent vers ces lieux, on note que les anciennes églises sont encore utilisées pour la célébration des rites de culte arménien orthodoxe, Elles sont donc reconnues comme lieux de culte, de dévotion et de prière par le peuple (Luschi, Zerbini, 2020). En effet, la mémoire historique d'un lieu est traçable dans le paysage constitué autour, et le fait que des noyaux urbains fidèles à ces terres persistent encore, malgré les effets des phénomènes de dépeuplement, c'est un signe d'attachement bien plus profond et enraciné.

La recherche donc peut aller dans une direction de connaissance pour de possibles stratégies de sauvegarde et de développement pour un territoire riche en ressources et avec une forte tradition rurale. Après avoir contextualisé le contexte de l'urbanisation de la Vayots Dzor, la recherche se déplace d'abord dans le sens d'une reconnaissance cartographique territoriale,

Masterplan du projet d'intervention sur l'ancienne installation monastique de Tsaghats Kar. Esposito, 2020.

Masterplan du projet du centre de formation culturelle et universitaire sur le site du monastère d'Arates. Vezzi, 2020.

géolocalisant les différents centres habités, puis dans le relevé territorial de l'un d'eux, le village de Yegheghis, présenté ici comme étude de cas.

L'étude de cas : le village de Yegheghis

Dans une lecture à grande échelle on voit que les villages en Arménie représentent un fort témoignage physique de la valeur culturelle d'un territoire vierge de toutes les interventions de transformation qui auraient pu trahir ou cacher cette valeur identitaire. C'est pourquoi il apparaît encore plus important d'intervenir avec une stratégie de réhabilitation pour valoriser le village en lui fournissant des lignes de développement possibles.
Cela signifie planifier une intervention seulement après avoir étudié toutes les particularités locales propres, soit du paysage (matières premières, ressources hydriques, flore, faune et possibles productions connexes), soit de l'architecture (typologies de construction, technologies de construction, matériaux utilisés).
La campagne de relevé effectuée sur le village de Yegheghis a permis d'élaborer et de restituer la cartographie de ce terriotire, en mettant en relation la conformation morphologique du terrain avec le noyau urbain construit (campagne de relevé 2019).
Le relevé confirme ce qui a été étudié à partir de l'analyse historique du village : Yegheghis semble en effet être l'un des centres les plus riches et les plus florissants sous la

période de domination romaine. En témoignage de cela, l'analyse évidence une importante présence de structures médiévales de type religieux éloignées l'une de l'autre quelques centaines de mètres. Il est évident qu'il s'agit d'un excédent par rapport à la taille actuelle du village lui-même (Aiello, Lecci, 2018).

La restitution cartographique permet de visualiser comment les églises médiévales, de Zoraz ("des chevaliers"), de San Karapet (ou surb Nshan) et de San Astvatsatsin, s'insèrent dans le tissu urbain de Yegheghis, en faisant émerger l'empreinte de l'ancien village par rapport à la conformation actuelle. On note aussi la différence architecturale (système de construction et matériaux d'usage) du bâtiment résidentiel par rapport aux anciennes constructions lapidées des églises, avec la conscience que partir du patrimoine matériel est toujours à poser à la base des stratégies de valorisation et de revitalisation.

L'activité de relevé se concentre sur l'analyse des matériaux locaux et des techniques de construction traditionnelles, différentes par typologie de bâtiment et époque de réalisation. On peut evidencer la différence qu'il y a dans la sagesse constructive des différentes typologies de construction et ensuite on peut comprendre les techniques de construction relatives de manière à pouvoir penser une oeuvre de sauvegarde et de restauration qui soit cohérente avec la restauration traditionnelle.

Comme ça le projet de réhabilitation est soit correct d'un point de vue scientifique, soit il garantit la faisabilité de la réalisation par la main-d'œuvre locale, tant pour ses connaissances techniques que pour la disponibilité des matériaux de construction.

L'analyse typologique du bâtiment a divisé donc le bâtiment en deux groupes: l'architecture résidentielle et l'architecture cultuelle. Quant à la production architecturale des églises, elle concerne les périodes du IXe au XVIe siècle. Les constructions montrent une habile main-d'œuvre et une sage maîtrise de la connaissance constructive, les tannages en pierre sont travaillés et extraits des carrières présentes dans les montagnes voisines. Une généralisation typologique ne peut cependant pas être faite, car elles présentent des caractéristiques compositives et spatiales profondément différentes les unes des autres (Cuneo, 1988).

En ce qui concerne la construction résidentielle du village par contre, on peut différencier l'ancien tissu de matrice romano-byzantine des suivantes réalisations d'époque plus récente, qui ont oublié toute logique compositive du système "ville" laissant place à une agrégation "chaotique" de bâtiments. À partir de là, on peut cependant généraliser sur la typologie de construction de ces derniers, en trouvant comme plus petit dénominateur commun, la technique de construction utilisée.

Stratégies de valorisation: projets de développement durable

A' partir des analyses effectuées on a pensé des possibles stratégies d'intervention pour sauvegarder et valoriser ces réalités en abandon. Un type d'intervention envisagé est une exploitation rationnelle du territoire et des ressources, en appliquant une gestion territoriale favorable à la population, capable de développer une économie locale autonome et subsidiarie. C'est le cas d'un projet d'implantation le long de la vallée du fleuve Arpa qui prévoit la réalisation d'un Gymnasium Agricole à l'intérieur d'un système d'aménagement du territoire : de l'exploitation et de la transformation agricoles, de l'exploitation de l'eau pour l'aquaculture et l'énergie hydroélectrique, de l'exploitation de terres agricoles à l'école, à l'élevage de subsistance et à la production d'énergie. L'intervention se situe dans le cadre du développement durable local, en créant un pôle attractif qui soit de formation et professionnelle, en garantissant une revitalisation locale capable de générer économie, production et travail. (Prodi, 2018)

Une autre intervention de planification sur le territoire, toujours dans le cadre des logiques de planification décrites ci-dessus, prévoit la réalisation d'une manufacture de traitement du mûrier, avec des terres agricoles pour les plantations (Pasquini, 2020). Le projet, situé dans le village de Yegheghis, s'implante sur une préexistante construction agricole en prévoyant sa restructuration et son agrandissement. Après avoir approfondi une étude tant sur les essences forestières locales que sur les potentialités offertes par le territoire, on a structuré un projet qui pourrait constituer un centre de traitement et de production d'une matière première locale.

Par conséquent, l'installation a prévu à la fois l'aménagement des terrains en cultures de mûrier, à transformer ensuite en confitures et en distillats typiquement locaux, et la réalisation d'une serre pour les mûriers et pour l'élevage des vers à soie, avec lesquels ouvrir ensuite la filière de production de la soie elle-même. Un système d'approvisionnement en énergie a également été mis en place grâce à des méthodes d'exploitation des ressources renouvelables offertes par le site, telles que mini hydraulique et biogaz, favorisant ainsi l'énergie durable au service de l'ensemble du village. Un projet qui souligne les concepts d'une économie basée sur la subsidiarité qui tente dans la pratique d'encourager la revitalisation des petites réalités en réinvestissant sur le territoire même.

Conformément à ce qui a été dit jusqu'à maintenant, on propose deux autres projets qui se présentent comme des stratégies d'intervention pour la revitalisation du territoire.

Le premier concerne une intervention sur l'ancienne installation monastique de Tsaghats Kar, dans les montagnes au nord de Yegheghis (Esposito, 2020). Le projet consiste en une série d'interventions, telles que la réalisation d'un habitat proche de l'ancien site

archéologique, la réouverture et la mise en service de l'ancienne carrière et l'installation d'un téléphérique reliant Tsaghats Kar et Yegheghis, soit pour le transport du matériel extrait en carrière, soit à l'usage des citoyens et des touristes.
Dans ce cas il s'agit d'un centre productif économique qui réactualise une antique installation, aire historiquement à vocation productive, en utilisant la technologie disponible aujourd'hui pour surmonter les écarts géographiques du lieu qui l'ont conduit à l'abandon total dans le temps, suite à une importante décroissance désomographique du dernier siècle causé par les phénomènes de métropolisation.
Le deuxième projet concerne la revitalisation d'un autre complexe monastique abandonné à Vayots Dzor, le monastère d'Arates, en prévoyant la restauration et le projet d'y établir un centre de formation culturelle et universitaire (Vezzi, 2020). Les deux hypothèses partent du relevé élaboré au cours des différentes missions de recherche et se développent toujours à l'intérieur des concepts d'économie circulaire, à la différence que, dans ce deuxième cas, le pôle attractif se concentre sur le profil culturel et de formation, en offrant un accueil aux chercheurs locaux et étrangers à travers l'agrandissement du site avec des lieux dédiés à l'hôtellerie.

Conclusion

Cette analyse montre comment l'acquisition de données passe nécessairement par la connaissance approfondie de l'architecture historique, qui est mise à profit pour proposer des interventions de récupération à travers les matériaux locaux et les technologies que la population peut reconnaître et utiliser.
La stratégie que nous proposons est fondée sur une subsidiarité et une interdépendance d'interventions capables d'offrir à la population les instruments de développement à partir des ressources locales et des potentialités du lieu.
La mise en service d'une ancienne carrière dans les montagnes, le travail de la pierre de construction, l'installation des fabrications pour traiter les matières premières, l'exploitation des énergies, la requalification des connexions routières, la construction de maisons, d'écoles et de places : interventions toutes liées les unes aux autres, qui récupèrent mémoire et tradition pour en faire un instrument de développement. Ces actions génèrent un accroissement du travail et un développement d'une autonomie locale.
Les quatre projets proposés enfaite forment mutuellement un système fondé sur le principe d'économie circulaire. La caractéristique de subsidiarité qui y est mise à la base les rend dès lors capables d'être eux-mêmes des pôles attractifs et en même temps de fournir ce dont les autres centres ont besoin pour fonctionner.

Cet enchaînement non seulement évite le danger d'isolement de chaque centre, et donc lutte contre les phénomènes d'abandon, mais devient aussi un moteur actif pour l'économie locale, qui, en respectant le territoire, le relève et y réinvesti. On crée ainsi des services utiles et nécessaires à la population locale qui est incitée à habiter activement le village, où elle peut y trouver des possibilités d'éducation pour chaque degré, de travail et de logement. Il génère ainsi un système territorial en réseau qui relie les projets individuels et met les caractéristiques de chacun d'eux au service de l'ensemble de la communauté.

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Villages et quartiers à risque d'abandon sont aujourd'hui une problématique commune à des nombreuses régions de la Méditerranée, considérée comme un point stratégique dans les nouvelles politiques européennes. L'abandon progressif des zones internes est une constante dans les pays caractérisés par le sous-développement économique, avec les phénomènes d'émigration et de fragmentation du patrimoine culturel. Cela entraîne des problèmes d'architecture et de gestion du territoire. L'objectif principal de ce travail de recherche est de créer un espace de discussion qui comprend l'étude du patrimoine architectural et du paysage ainsi que les témoignages démo-ethno-anthropologiques.

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