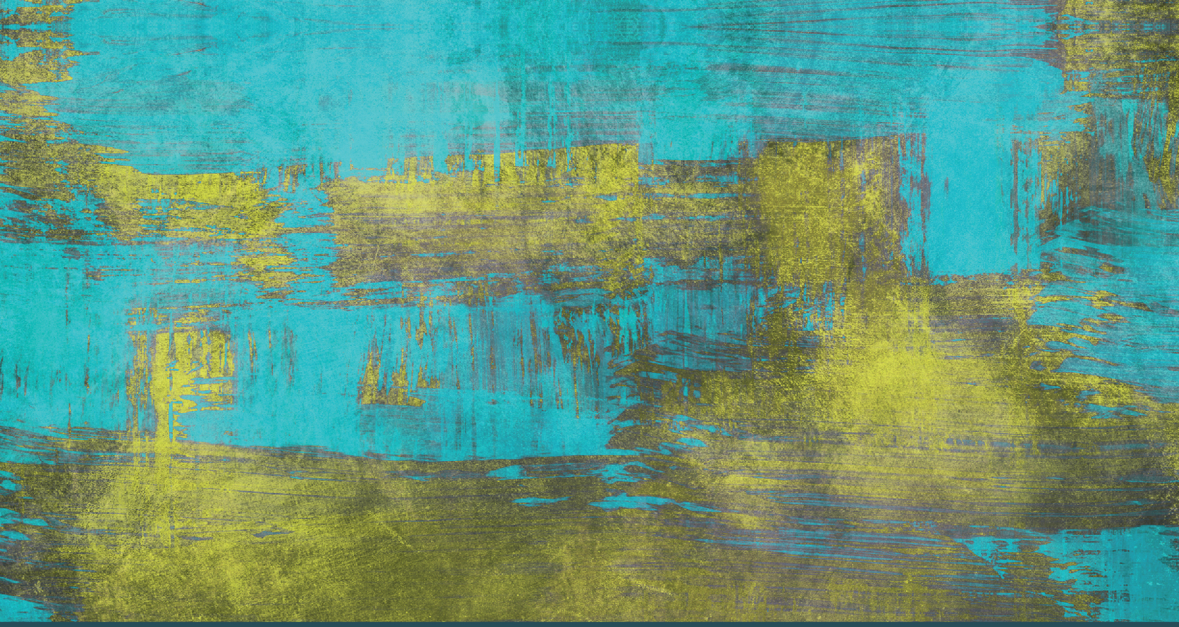

Earthscan Studies in Natural Resource Management

DRYLANDS FACING CHANGE

INTERVENTIONS, INVESTMENTS AND IDENTITIES

Edited by
Angela Kronenburg García, Tobias Haller,
Han van Dijk, Cyrus Samimi, and Jeroen Warner

ROUTLEDGE

Drylands Facing Change

This edited volume examines the changes that arise from the entanglement of global interests and narratives with the local struggles that have always existed in the drylands of Africa, the Middle East, and Central Asia/Inner Asia.

Changes in drylands are happening in an overwhelming manner. Climate change, growing political instability, and increasing enclosures of large expanses of often common land are some of the changes with far-reaching consequences for those who make their living in the drylands. At the same time, powerful narratives about the drylands as 'wastelands' and their 'backward' inhabitants continue to hold sway, legitimizing interventions for development, security, and conservation, informing re-emerging frontiers of investment (for agriculture, extraction, infrastructure), and shaping new dryland identities. The chapters in this volume discuss the politics of change triggered by forces as diverse as the global land and resource rush, the expansion of new Information and Communication Technologies, urbanization, the COVID-19 pandemic, and the spread of violent extremism. While recognizing that changes are co-produced by differently positioned actors from within and outside the drylands, this volume presents the dryland's point of view. It therefore takes the views, experiences, and agencies of dryland dwellers as the point of departure to not only understand the changes that are transforming their lives, livelihoods, and future aspirations, but also to highlight the unexpected spaces of contestation and innovation that have hitherto remained understudied.

This edited volume will be of much interest to students, researchers, and scholars of natural resource management, land and resource grabbing, political ecology, sustainable development, and drylands in general.

Angela Kronenburg García is an F.R.S.-FNRS Postdoctoral Fellow at UCLouvain, Belgium, and a Postdoctoral Researcher at the University of Padua, Italy.

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Contents

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Tobias Haller is a Professor at the Institute of Social Anthropology at the University of Bern. He studied social anthropology, geography, and sociology at the University of Zurich. He did research on institutional change in agriculture and common-pool resources management in Cameroon and Zambia and led several comparative research projects on the management of the commons in floodplains in Mali, Cameroon, Tanzania, Zambia, and Botswana; on land, water, and green grabbing with impact on gender relations in Kenya, Sierra Leone, Morocco, Ghana, Tanzania, and Malawi; on food systems in Kenya and Bolivia; on social and environmental impacts of oil and mining companies and mega-infrastructure projects worldwide; on the management of the commons in Switzerland; and on constitutionality (participatory bottom-up institution building). He is currently developing a theoretical approach combining New Institutionalism and Political Ecology (NIPE). He is the leading author of *Commons in a Glocal World* (Routledge 2019) and *Balancing the Commons in Switzerland* (Routledge 2021).

Cyrus Samimi holds a Professorship of Climatology at the University of Bayreuth, where he also serves as Vice Dean of Digital Solutions in the Cluster of Excellence Africa Multiple. His MSc, PhD, and Habilitation all had a focus on drylands, with a broad range of topics. Before joining the University of Bayreuth, Prof. Samimi held the Professorship of Geoecology at the University of Vienna, first as Visiting and then as Full Professor. His research projects have regional foci in southern Africa, the Sahel, and Central Asia. In his research, links between climate change, environmental change, and human activities are analysed with strong empirical work in the project regions and modelling approaches. Most of his projects are interdisciplinary and partly transdisciplinary, the latter with the aim of joint knowledge generation. He has published more than 60 papers and book chapters with a focus on drylands.

Han van Dijk is a Professor in the Sociology of Development and Change Group at Wageningen University, The Netherlands. He studied tropical forestry at Wageningen University and social anthropology at Utrecht University. He has a general interest in pastoralism and the politics of resource governance regimes in drylands, and on their relation to decentralization and state formation. He did research on drought and pastoralism in the Sahel (Mali); on migration and climate change; on the consequences of conflict on land use in Chad, and post-conflict land governance in Central Africa (Burundi, South Sudan, Uganda); and on the governance of aquaculture and fisheries in the Mekong Delta and Lake Victoria. Currently, he is directing research on climate change, conflict, and migration in the Sahel and Ganges and Mekong Delta, and he coordinates research on the transformation of food systems in the Sahel to contribute to conflict prevention and resolution. He was also involved in research on health systems in Ghana.

Jeroen Warner is a Senior Associate Professor of Crisis and Disaster Studies at Wageningen University, where he received his PhD (2008). A Founder Member of the London Water Research Group, Jeroen works on domestic and transboundary water conflict and cooperation, multi-stakeholder participation resource management, and water governance, especially in Europe, the Middle East, and South Asia. He has published seven books and well over 100 academic and professional articles, and is Editor-in-Chief of the *International Journal of Water Governance*. He won a CAPES scholarship as Special Visiting Professor at the University of Sao Paulo in 2015. He coordinated the European Horizon 2020 Coordination and Support Action, EDUCEN, and he was Wageningen Coordinator in two Integrated Projects funded by the Dutch Science Foundation: Dynamic Deltas and Hydrosocial Deltas.

Contributors

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Bilal Butt, PhD, is an Associate Professor in the School for Environment and Sustainability at the University of Michigan. His research is concerned with understanding the drivers and effects of violent conflicts over natural resources. He places a large emphasis on empirical fieldwork to understand the lived geographies of the interactions between people and the environment in ecologically heterogeneous regions. He combines various geospatial technologies with historical and ecological dynamics of dryland environments to understand how differential power relations between agencies, states, and other actors come together to influence the etiology of resource conflicts. He is also interested in the ways that scientific and technical appraisals of indigenous peoples and environments have misread the landscape, leading to orientalist approaches to development programmes. He has also had a long history of engagement on questions of environmental conflicts, particularly around wildlife poaching, land grabs, and green energy.

Dawn Chatty is an Emeritus Professor in Anthropology and Forced Migration and former Director of the Refugee Studies Centre, University of Oxford, United Kingdom. She is also a Fellow of the British Academy. Her research interests include coping strategies and resilience of refugee youth; tribes and tribalism; nomadic pastoralism and conservation; gender and development; and health, illness, and culture. She has edited numerous books, including *Deterritorialized Youth: Sahrawi and Afghan Refugees at the Margins of the Middle East* (Berghahn Books, 2010); *Nomadic Societies in the Middle East and North Africa: Facing the 21st Century* (Leiden, Brill, 2006); *Children of Palestine: Experiencing Forced Migration in the Middle East* (Berghahn Books, 2005); and *Conservation and Mobile Peoples: Displacement, Forced Settlement and Sustainable Development* (Berghahn Press, 2002). She is the Author of *Displacement and Dispossession in the Modern Middle East* (Cambridge University Press, 2010); *From Camel to Truck* (White Horse Press, 2013); and *Syria: The Making and Unmaking of a Refuge State* (Hurst Publishers, 2018).

Davide Cirillo holds a joint PhD in human and physical geography at the University of Padua and in social and cultural anthropology at the Vrije Universiteit of Amsterdam. He is a Member of the interdepartmental Center of Research and Technical Cooperation with Africa of the University of Torino and of the European Evaluation Society. Nowadays Davide is working as an independent Researcher and Consultant for NGOs, think tanks, and development institutions, and as a Technical Advisor for a development cooperation consulting

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Sabdio Wario Galgallo is aged 44 years old and is from the Gabbra pastoralists of Kalacha in Marsabit County. She is married and the mother of three children. She has a Diploma in community-based development and is a Student at the University of Nairobi pursuing a Bachelor's degree in public administration, political science, and psychology. Sabdio lives and works in Kalacha and is deeply involved with the Gabbra people and their culture. She was appointed as the first Gabbra Woman Chief (2009 to date) and is currently working for Kenya National Government as a Senior Chief-1 for Kalacha location, Chalbi sub-county as a representative of the President at the local level.

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Markus Giger is a Co-Leader of the Sustainability Governance Cluster at the Centre for Development and Environment (CDE) of the University of Bern, Switzerland. He has studied agricultural economics at the ETH Zurich and in Montpellier. Previously, he worked for the International Labour Office in Indonesia and FAO in Rome. Markus is specialized in development issues such as food security, climate change, desertification, and land governance. Currently, he is the Chairman of the Land Matrix Initiative, an international consortium that aims at increased transparency on international land acquisitions. He also participated in the AFGROLAND Project, an interdisciplinary project that investigated large agricultural investments in Kenya, Mozambique, and Madagascar. He is involved in the R4D Project 'Towards Food Sustainability', funded by the Swiss National Science Foundation. Markus is a Co-Author of several scientific papers dealing with land acquisitions and their impacts on livelihoods, poverty, and sustainability.

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Heino Meessen holds a PhD in landscape ecology. His work has mainly focused on transition processes in Eastern Europe and Central Asia. He has been working at the Centre for Development and Environment (CDE), University of Bern, Switzerland, for the past 22 years. Before that, he spent 15 years working for various international NGOs based on his educational background in nature conservation. As a Senior Researcher at CDE, Heino specializes in applied research on nature conservation and management of large protected areas. Through his projects, he has learned to work with local people, building on local expertise and systematically considering the needs—beyond conservation—of regions hosting large protected areas. He has supported the implementation of locally driven pilot projects—for example, the introduction of eco-toilets (Georgia), improvement of water supply (Azerbaijan), and development of mountain hiking routes (Bulgaria and Switzerland). He has also worked to promote transboundary management of large protected areas as 'peace parks'—for example, between Georgia, Azerbaijan, and Russia. In

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Monika Mętrak, PhD, is an Assistant Professor at the Faculty of Biology of the University of Warsaw. Her work is focused on the functioning of wetland ecosystems in the context of climate change and on environmental pollution with persistent organic pollutants. In her studies, she uses modern analytical techniques, such as analysis of stable isotopic ratios or chromatography combined with mass spectrometry. Since 2010 she has been engaged in scientific collaboration with research institutions in Central Asia. So far she has taken part in five research expeditions to this region, resulting in several publications on the functioning of high-altitude wetlands in extremely arid areas. She is a Coordinator of the English-taught Masters' Studies 'Environmental Management', and an Author and a Teacher of many courses dedicated to Polish and foreign students, and regularly participates in the largest Polish science-communicating events.

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Lenaai ole Mowuo is a Loita Maasai from Kenya. A Farmer, he keeps cattle, sheep, goats, and bees and grows beans, maize, and potatoes. He belongs to the Ilmeshuki age group who recently finished the *manyata* of Olorika in 2021. He is married to one wife and is a father of four children (two boys and two girls), three of whom are at school. Lenaai has worked as a Research Assistant and a *boda-boda* (motorbike taxi) Rider.

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Annemiek Pas holds a PhD in human geography from Stockholm University (2019) and a degree in international development studies from Wageningen University. During her education, she conducted fieldwork in India and Brazil at the interface of governmental policies and local realities, studying local communities' perceptions of, and responses to, development policies and processes of change. Based on long-term ethnographic fieldwork in Kenya, her PhD research focused on the shifting politics of resource access in relation to the large-scale establishment of conservation spaces. More recently she works as a Researcher on nutrition-sensitive foodscapes in India, and she is the Coordinator of an EU-funded Marie-Curie research project and two farmer networks to co-develop research and practice towards sustainable food systems at the Farming Systems Ecology group at Wageningen University. Annemiek's research interest lies at the intersection of political ecology and environmental governance, examining conservation, agrarian change, and evolving property regimes.

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Maasai pastoralists, and conservation politics and understandings of climate change among Bissau-Guinean rice farmers. She has engaged members of both communities as collaborative researchers through participatory photography and filmmaking, resulting in co-curated photography exhibits in the United States, Portugal, and Japan, and an award-winning participatory documentary. Joana taught at the University of Osaka (2016); co-chaired the 'Climate Change, Food Security, Population' working group ('Drylands Facing Change' COST Action, 2017–2021); and co-leads the 'COVID-19 in African, Asian and North American Drylands' working group, which coordinates several projects on local responses to COVID-19. Her current project explores religious–environmental changes in Kenya, Mongolia, Mozambique, and the United States.

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communities, agricultural transformation, labour migration, migration intermediaries, and migrants in the gig economy. Her research areas mainly focus on China and Sweden. She is experienced in combining qualitative and quantitative methods and in interdisciplinary collaborations. Her awarded monograph *Pastoralists and the Environmental State: A Study of Ecological Resettlement in Inner Mongolia, China* (2015) contributes new understanding on the meaning of power in political ecology and nuanced knowledge on the relationship between migration, environmental change, and reflections on resettlement as a solution to environmental degradation.

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1 Drylands, frontiers, and the politics of change

Angela Kronenburg García, Tobias Haller, Han van Dijk, Jeroen Warner, and Cyrus Samimi[1]

Introduction

Change is of all times, but it would appear that in the drylands it is happening in an overwhelming manner. Climate change, growing political instability, and increasing enclosures of large expanses of land are some of the changes with far-reaching consequences for those who make their living in the drylands. In the dryland areas of Africa, the Middle East, and Central Asia/Inner Asia, these changes are taking place against the backdrop of a rapidly growing population, a lack of employment opportunities for the youth, food insecurity, and often long-standing state failure to provide basic services such as education and health care. However, under the radar, there are also signs of wealth creation in forms that are locally meaningful (Brockington and Noe 2021), as well as an increasing number of people taking things into their own hands—for example, through social movements. This edited volume is about the changes that arise from the entanglement of global interests and narratives with the local struggles that have always existed in the drylands. The notion of 'frontier' is a useful starting point to frame this entanglement, as the term can be understood both as a narrative and as a place in flux (Imamura 2015). This introductory chapter uses it as a metaphor to paint the broader picture and as a way to bring the different chapters in the volume together. However, when digging deeper into the contemporary changes and struggles (as the individual chapters do), and in order to understand the full politics of frontier processes, we take analytical approaches that take into account historical institutional changes and different forms of power relations. While recognizing that changes are co-produced by differently positioned actors from within and outside the drylands, this volume aims to provide the viewpoint of the drylands. It therefore takes the views, experiences, and agencies of dryland dwellers as the point of departure to understand the changes that are impacting on and transforming their lives, livelihoods, and future aspirations.

Drylands as frontiers

As a narrative or discourse, a frontier refers to a 'space of opportunity' (Imamura 2015: 96), and it is typically thought of in this way by outsiders such as investors, donors, and the media when they describe the untapped riches or development

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potential (i.e. the need of development) of what they regard as faraway and isolated areas. The deserts and grasslands of Mongolia, for example, have been described as 'the new frontier' by mining investors, following discoveries of the world's largest copper and gold deposits in 2001.[2] Similarly, scholars have referred to undeveloped areas of research as new frontiers. As a place, 'frontier' refers to a geographical region that is facing a new expansive force, usually externally driven, and suggests that the area is about to be transformed or is already undergoing rapid transformation (Imamura 2015). Although the concept of frontier has primarily been used to analyse rapid land-use change (e.g. agricultural expansion), this powerful force

> could be anything so long as it is commonly understood to be expanding in a rapid and overwhelming manner: it could be neoliberalism, urbanization, democracy, Christianity, terrorism, nuclear science, or digital technology.
> (Imamura 2015: 97)

It is in this broad sense that we propose to look at drylands as frontiers. This volume will discuss the struggles and entanglements triggered by forces as diverse as the global land rush, the expansion of new Information and Communication Technologies (ICTs), urbanization, the COVID-19 pandemic, and the spread of violent extremism. There are thus multiple 'frontiers' at play in the drylands, interacting with each other and with local ongoing processes, some of which may have been shaped by the 'legacies' of previous 'waves' of transformation (Kronenburg García et al. 2022), such as those stemming from the colonial period (see e.g. Haller 2019). The changes that come out of these processes are overwhelming, because they are so many and happening at the same time or in rapid succession, and/or intensifying each other. Put slightly differently, the drylands are a frontier for different actors and interests, whose actions are driven and legitimized by narratives of opportunity (this is what articulates the two notions of frontier). Yet, because frontiers are places where actors of unequal power interact (Tsing 2005), opportunity for some may mean misfortune for others. Narratives are part of this politics of change, evident in the labelling of the location (drylands in our case) and the 'othering' of the people that inhabit it, often in a negative way. Interactions with others shape ideas of the 'self' and produce new identities (Sökefeld 1999). This volume thus also delves into the narratives that inform and legitimize many of the interventions, investments, and ascribed identities that will be described.

The remainder of this chapter (after the background section) will provide overviews of the different chapters of the volume, organized in sections in such a way that they support points made (e.g. about narratives) or distil some general patterns arising from thematically related chapters (e.g. land-based investments and interventions). The order in which the overviews appear here does not reflect the structure in which they appear in the volume.

Background to the volume

This volume came about at the initiative of Working Group 2 of the COST Action 'Drylands Facing Change: Interdisciplinary Research on Climate Change,

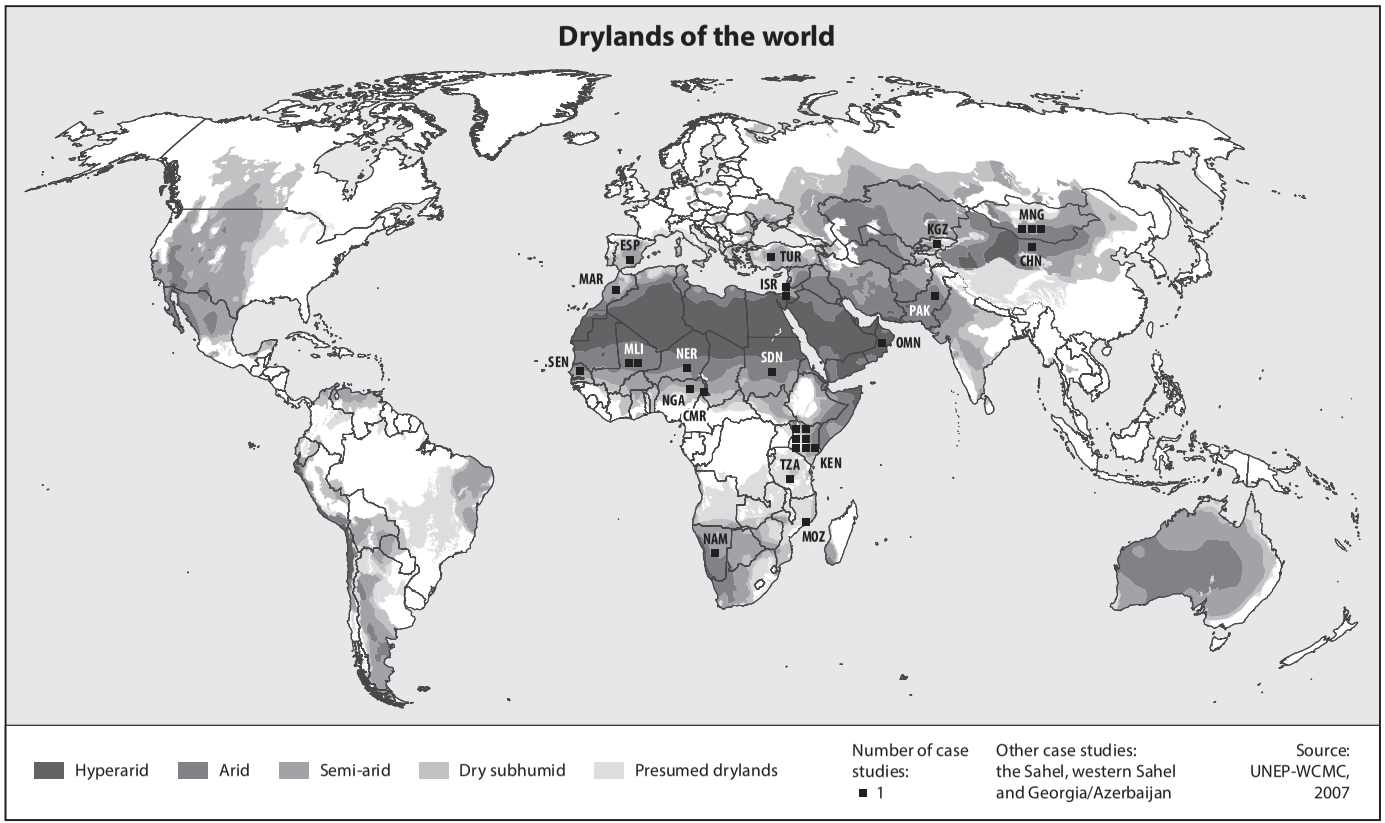

Figure 1.1 Drylands of the world.

Food Insecurity, Political Instability', a research network that brought together dryland scholars from Europe and beyond, and that ran between 2017 and 2021.[3] This backdrop explains some of the thematic, methodological, and geographical choices made for the volume. First, thematically, Working Group 2 focused on the nexus of conflict, institutions, and natural resource use; therefore, much of the volume deals with the impacts of large land-based investments and interventions on access and governance over land and natural resources. This is important because the livelihoods of dryland populations are largely land- and natural resource-based. Second, methodologically, we chose a collaborative approach that is reflected in the multi-authorship of the different chapters. Most chapters are organized around case studies, the majority of which draw from authors' past empirical research and sometimes from new unpublished research material. In this way, each chapter provides a literature review of the subject matter, while also illustrating it with concrete examples from the drylands.

Third, geographically, the 'Drylands Facing Change' COST Action focused on the drylands surrounding Europe, as the place of origin of many of the refugees and migrants in Europe. The aim was to bring nuance to simplistic explanations of the problems in dryland areas that allegedly underlie these flows of people, including a critical look at the role of European actors therein. Although this volume does not delve into the EU migration question, that question influenced the geographical focus of the COST Action. Therefore, the volume's coverage of the world's drylands is limited to the dryland regions of Africa, the Middle East, and Central Asia/Inner Asia, with one chapter including a case in southern Europe.

In terms of the extent of the drylands in these regions, we take as our starting point the most common and accepted definition of drylands, which relates to their aridity. Officially, drylands are areas where the aridity index is no more than 0.65, classified into four zones: hyper-arid, arid, semi-arid, and dry sub-humid.[4] However, there are areas with a greater aridity index (i.e. more humid than the dry sub-humid zone) that still have significant dryland features ('presumed drylands' on the map), particularly that of seasonal water shortages, large expanses of which areas are found in Africa (FAO 2019).[5] In this volume, we take a broad view of drylands that includes these non-official dryland areas (Figure 1.1).

Drylands and dryland livelihoods

Drylands cover at least 46% of the global land area and are home to around 3 billion people (IPCC 2019). They are characterized by limited water; low, unpredictable, and spatially variable rainfall that is also highly variable from year to year (i.e. droughts); and a pronounced dry season. As a result, the natural resources to base livelihoods on are dispersed, variable, and available only seasonally, particularly water. Based on knowledge produced over time, dryland populations have adapted their resource uses to these dynamic conditions, which, in turn, have shaped dryland landscapes and infused them with cultural meaning (Haller 2019). These populations include farmers, pastoralists, hunter-gatherers, fishing communities, and artisanal miners. We can find many variations (e.g. shifting

cultivation, recessional agriculture) and mixes (e.g. agropastoralism, pastoralism combined with artisanal mining) of rural livelihoods in the drylands, linked to markets to various degrees. Mobile livelihoods, however, seem to be best suited to dealing with the uncertainties and variabilities of dryland environments, particularly during prolonged dry seasons and droughts.

Chapter 2 discusses how mobility, particularly that of pastoralists, requires institutions (rules) that allow for the flexible (re-)negotiation of access and common use of resources in both space and time. Institutions to manage access to common-pool resources (e.g. pastures and water) co-exist with more exclusive and individual claims—such as those over agricultural land by small-scale farmers—and when these overlap and cannot be coordinated they may lead to conflict. The authors show that mobility and flexibility may be more important now than ever before because climate variability in the drylands is increasing and therefore also the patchiness of resources. Given these changes, the authors propose a new analytical framework for understanding resource governance in drylands that is built around the notion of institutional flexibility.

Chapter 10 shows how urban livelihoods have become an integral part of the drylands. It explores how non-linear, circular rural–urban migration to dryland cities shapes new livelihoods. Sudan has seen migration from farmers and pastoralists to Khartoum in search of opportunities as well as to escape from precarious livelihoods, droughts, and violent conflict. Most have ended up in the informal sector. In Inner Mongolia (China), disasters (heavy snowfall, droughts, dust storms) and mobility limitations increasingly compromised pastoral livelihoods. The state then introduced policies to settle pastoralists into urban livelihoods. Results were mixed; after a few years, many went back to their pastoral homes and resumed herding, while most of those that stayed maintained strong rural links, relying on both places for their livelihoods. The Khartoum case also shows a similar dynamic of rural return and multi-sited livelihoods. In drylands, rapid urbanization is increasingly shaping these interlinked rural and urban livelihoods.

Narratives

Narratives are important because they have material effects and shape identities, especially those that are propagated by powerful actors such as investors, international conservation organizations, UN agencies, state authorities, elites, and others (see Chapter 3).

One narrative that returns in several of the chapters is that of drylands as 'wastelands'—that is, regions of little economic or environmental value, inhabited by poor people that are degrading and exploiting the land—and therefore drylands require intervention (Hoover et al. 2020). Pastoralists in particular have been accused of overstocking, overgrazing, and desertification, a narrative that is plainly incorrect, as Chapter 2 explains. Pastoralism has also been described as a 'traditional', 'backward', and 'irrational' practice that needs to change (see Chapter 5). These narratives have informed all kinds of policies and development interventions in the past and still today (see Chapter 11 for the introduction of a

mobile phone app to replace 'old' ways of finding pasture and water). Another narrative that dates back to the colonial past is that of drylands as home to 'unruly' people (because mobile) that need to be controlled. This narrative has made a recent comeback in the labelling of drylands as hotbeds of extremism and its inhabitants as 'terrorists'; yet, as Chapter 9 demonstrates, there is no necessary link between drylands and extremism. The ascribed 'terrorist' identity legitimizes foreign military interventions in the Sahel and other places, but can also be used locally to prevent investments (Haller 2020).

The narrative of wastelands belongs to a particular category of 'environmental crisis' narratives, discussed in Chapter 3 with three case studies (on the water wars, Sustainable Development Goals (SDGs), and energy transition narratives). Labelling a situation as a crisis legitimizes urgent intervention and accepts the sacrifice of some for the collective good. The energy transition narrative, for example, purports to fight the global climate crisis; but in resource-rich regions where the resources required for clean technologies are found, this narrative overlooks many inconvenient effects, particularly that of displacement of rural populations. Dominant regarding the drylands is a simplistic Malthusian crisis discourse: overpopulation leads to resource scarcity leads to poverty leads to violent conflict. The water wars narrative is based on unfounded links between water scarcity and violent conflict but has justified many top-down interventions in (potential) conflict zones in drylands. Malthusian misconceptions also underlie the SDGs, particularly the idea that overpopulation, poverty, and environmental problems are produced locally and can be fixed by states and investors, a framing that depoliticizes the historical roots and the political economy of these problems.

Underlying many of the recent large-scale land-based investments and interventions is a narrative of opportunity, which strategically connects not only with other development (e.g. to create employment) and crisis narratives (e.g. the need to feed a growing global population), but also with similar narratives that have a long history in the drylands. The 'unowned and vacant lands' narrative, underpinned by a sedentary and agricultural bias, enabled most colonial states to claim lands that were not settled or permanently cultivated as their own, including the power to sell, lease, and grant these lands to white settlers and companies (Alden Wily 2012). Hence, this narrative disregarded rights to land and resources that were used seasonally and for purposes other than agriculture, such as wetlands, grazing land, hunting grounds, and forests (Alden Wily 2012), many of which resources are found in drylands. The 'unowned and vacant lands' narrative is intimately linked to a discourse of *terra nullius* that defines drylands and particularly commons as 'empty' and 'underutilized' (Makki 2014). Together, these narratives lie at the root of the invisibility of local institutions and of the importance of common-pool resources for dryland livelihoods, and, as Chapter 5 explains, they drive much of the 'commons grabbing' (Haller 2019) currently taking place in the drylands.

The narrative of opportunity links to these older narratives but also adds a new twist. It echoes the *terra nullius* discourse, with its notion of emptiness (frontiers are often viewed as sparsely inhabited areas), and the 'unruly' place narrative, with its idea that frontiers are conflict-prone and thus somewhat risky investment

destinations (Tsing 2005). But beyond this idea of emptiness (of people), this narrative also emphasizes the large opportunities offered through an 'abundance' of resources (Larsen 2015), be they 'free' or 'available' land, large graphite deposits for energy transition, wildlife for biodiversity conservation, or wind for clean energy production. Frontiers emerge when an abundance of new resources are discovered or (re)invented and become accessible, and when actors rush in to commercialize, develop, or protect these resources (Rasmussen and Lund 2018). It is this narrative of 'empty, but full' (Regassa et al. 2018: 8), supported by other narratives, that legitimizes large-scale investments and interventions in the drylands.

Land-based investments and interventions

The global land and resource rush—that is, the recent wave of large-scale land-based investments and interventions across the world—has worked its way into the drylands. Investments and interventions can come in various forms: commercial agriculture, resource extraction, infrastructural development, and nature conservation. Each form builds on its antecedents and has its own history of acceleration. The global rush for mineral extraction began in the early 2000s when many countries liberalized their mining sector (Jacka 2018), while the rush for farmland accelerated later around the food and financial crises in 2008 (Alden Wily 2012). A new wave of conservation interventions emerged in the early 1990s when community-based conservation initiatives started to spread outside national parks and reserves (Adams 2004). The most recent land-based expansion is the growth of mega-infrastructure projects, epitomized by the Chinese Belt and Road Initiative and the re-emergence of development 'corridors', especially in Africa (Chome et al. 2020; Haller et al. forthcoming). All of these take control of large areas of land by deploying more exclusionary access regimes in the form of private property or state property, which not only reduce the natural-resource base of dryland livelihoods but also run counter to the institutional flexibility that is needed to cope with the environmental vagaries of the drylands. Chapters 4–8 zoom in on the politics of resource access and governance. They explore how longstanding land uses and access institutions are being affected by large investments and interventions, and what this means for dryland livelihoods.

Chapter 4 looks at the investments and interventions that occur in wetland areas, a vital source of water and other resources for dryland populations. Based on three cases of large-scale wetland appropriation in Africa (for irrigated agriculture in the Sahel, biodiversity conservation in Cameroon, and heavy sands mining in Mozambique), the chapter discusses three processes of change: the rigidization of resource use and management (as opposed to the flexibility suitable for a climatic-variability context); the institutional changes that undermine local common property institutions and eventually lead to open access and violence; and the (anticipated) loss of resilience as historical wetland users lose or face losing access to a key source of livelihood and food security.

Chapter 5 focuses on large-scale agricultural investments. It builds on, yet critically engages with, the 'land grab' debate and discusses four blind spots that

are particularly relevant for understanding the impacts on dryland populations. One is the variability of numbers reported on single investments, highlighting the need for studying investments as processes with open outcomes. Another is how the label 'land grabbing' has obscured similar processes in regions where such labelling is not used in the scholarship. The third concerns the invisibility of common-pool resources and the importance of their loss to mobile livelihoods. The fourth relates to the scholarly disinterest in studying investment failures and struggles, which risks missing out on important post-investment dynamics. The authors conclude that thorough, on-the-ground, and longitudinal research will best illuminate these blind spots.

Chapter 6 looks at mining struggles in the Sahel (gold along the Birimian Belt, uranium in Niger) and in the Gobi (gold and copper in Mongolia). It discusses the complex relationships between large-scale industrial mining, small-scale artisanal mining, and pastoralism. The authors show that while both industrial and artisanal mining affect pastoralism (by limiting mobility, reducing access, and polluting water and pastures), artisanal mining has also emerged as an alternative, complementary, or temporary livelihood in the face of waning pastoral viability or due to other factors such as conflict-induced displacement. Without this option, the alternative, particularly for the youth, is outmigration (to other countries, urban areas) or turning to illicit activities—for example, joining extremist groups, as was observed in the Niger case.

Chapter 7 presents seven cases of mega-infrastructure projects in Africa and Central Asia developed to improve connectivity, increase agricultural production, generate energy, or to 'green' landscapes. The chapter argues that mega-infrastructure projects link to the land rush in two ways: not only do they 'grab' land and resources themselves; they also improve accessibility to previously inaccessible regions, giving land rush processes a new boost potentially larger in scale and speed than ever before. In addition, the cases show that impacts are differentiated. While elite actors often secure some gains for themselves, the most marginal groups bear the brunt of eviction, commons grabbing, and restricted access to resources, potentially leading to conflicts between and within communities, as shown in the Kenya case. Finally, as mega-infrastructure projects are often embedded in larger territorial plans, they also extend state control into drylands, sometimes purposively for political reasons (e.g. to curb Kurdish secessionism in Turkey).

Chapter 8 analyses conservation as a new green-grabbing frontier. The expansion of conservation has a long history in the drylands, which the chapter illustrates with four cases. In Oman, the reintroduction of the oryx in traditional pastoral lands was done in a top-down manner and soon led to all kinds of conflicts, including about pastures during droughts. The Caucasus presents a complex case of conflict between nature conservation and cross-border transhumance in the Vashlovani region between Georgia and Azerbaijan. The case of Kenya shows how becoming a community conservancy has been both beneficial and problematic for local agropastoralists, while the community conservancy case in Namibia, though neither perfect nor without conflict, has brought considerable benefits to the local population.

The general picture that emerges from these chapters is that dryland populations are progressively losing access to and control of land and resources and that their commons are shrinking. Faced with few alternatives, this is increasingly compromising their resource-based livelihoods and mobility, adding uncertainty to their lives and challenges to sustainable livelihoods, already under pressure from increasing climate variability and other factors such as population growth. Chapter 2 even foresees a bleak future for mobile pastoralism.

Yet, here and there we discern signs of agency and more positive outcomes. Chapter 4 shows how Nigerian farmers re-appropriated the wetlands after a large agricultural project failed, re-introducing flexible resource use but also mixing old and new practices and knowledges (an important reason behind the argument in Chapter 5 that failures must be studied). Chapter 6 notes how Mongolian herders successfully claimed their rights and came to an understanding with a large mining company, thereby reducing conflict, while Chapter 8 demonstrates that community conservancy status in Namibia can bring considerable ecotourism income as well as stronger tenure security, especially vis-à-vis external groups interested in the land.

Chapter 13 focuses entirely on stories of success. It shows that under certain conditions, new institutions for governing access to natural resources can be crafted from below in response to disruptive changes, including changes triggered by large-scale investments and interventions. In Spain, local farmers organized themselves successfully to manage groundwater for irrigation after the state threatened to take over control. The Malian case study describes a fair and successful constitutionality process, mediated by an international NGO after external actors began to cut trees uncontrollably. In Israel, a huge wildfire exposed the failure of the state to protect a forest, which in turn empowered local groups to re-gain control over it. And in Kyrgyzstan, after years of unresolved conflicts, local residents successfully (and violently) halted a mine that had degraded their land, fragmented their pastures, and polluted their water. In all cases, support by an external agent, strong institutional memory, and high esteem and self-determination by local actors emerged as important factors for successful institution building.

Entanglements

While the chapters discussed in the previous section emphasized the impacts and implications of externally driven forces, the last set of chapters (9, 11, and 12) looks more closely at the *entanglements* and *articulations* of global forces with local existing struggles and conditions.

Chapter 9 shows how this entanglement can lead to violence. It discusses the spread of violent extremism and Muslim jihadism in dryland areas over the past decades. Focusing on the situation in the western Sahel, the chapter argues that violent extremism can best be understood as the connection of Muslim jihadist groups coming from the north, the global spread of a new Salafist interpretation of Islam (providing the 'ideological fuel'), and, importantly, local grievances

stemming from feelings of marginalization, especially among the youth. Fulani pastoralists, for example, joined forces with jihadists only when international peacekeepers were unable to provide security; but these pastoralists were equally inspired by Muslim sermons that resonated with local discontent about the loss of pastures and mobility, and about exploitation by state actors and their own elites. The authors propose to see violent extremism in the drylands as a rebellion from the rural periphery against dominant powers.

Chapter 11 explores the interaction of new ICTs with (ex)pastoral societies through four case studies. The Kenya case critically evaluates the assumptions of the developer of a new app called AfriScout, which aimed to provide pastoralists with information on grazing and watering areas (through maps), as well as on diseases and violent conflict. The Israel case shows how ICTs excluded female Bedouin students even more during the COVID-19 pandemic than before, as they experienced various digital divides and gaps. The Mongolia case discusses the efforts of local and international researchers to develop an app to empower pastoral communities with information and knowledge about mining activities in their vicinity. Finally, the Mali case shows how mobile telephony was instrumental in uniting Fulani pastoralists to establish security in their region and eventually mobilize against the state by joining jihadists. In the latter case, ICTs clearly shifted power relations.

Chapter 12 presents the most recent experience in the drylands of a rapidly expanding global force: the COVID-19 pandemic and particularly the harsh lockdown measures implemented in many dryland countries. Through four case studies in Kenya and Mongolia, the chapter shows how lockdowns challenged the lives and livelihoods of (agro)pastoralists in multiple ways; there were, for example, clear gendered impacts and in some places increased food insecurity. But there were also unexpected outcomes that bespeak the resilience of pastoral systems. In Kenya there was a revival of mobile pastoralism as conservation areas allowed grazing when tourism stopped; and in Mongolia, pastoralists provided food to the capital by organizing convoys of meat, receiving new national appreciation. This chapter shows that pastoralism was a key strength to weather the crisis and even contributed to supporting urban lives.

Final reflections

Chapter 12 is a good chapter with which to conclude this introduction. It reiterates the fact that drylands are not wastelands with unproductive land uses and people, but valuable regions with considerable economic and human potential. Such insights are no surprise when research is attentive to local voices. Travel restrictions during the COVID-19 pandemic prevented in-person fieldwork, and researchers had to adopt a remote and participatory approach to study the lockdown impacts and responses. They engaged dryland (agro)pastoralist friends as collaborative researchers and co-authors, who documented their communities' lockdown experiences and digitally shared their perspectives. Although this form of knowledge co-production requires careful, ongoing methodological

reflection and is not without its challenges, it perhaps responds most clearly to the volume's aim of taking the views, experiences, and agency of drylands inhabitants as a point of departure for analysis and research. Along with the other chapters in this edited volume book, we hope to have made a contribution to sharing a drylands' perspective on the multiple changes that dryland populations are currently facing.

Notes

1 Many thanks to Patrick Meyfroidt for his very helpful comments on an earlier draft of this chapter.
2 'Special report: Mongolia's fabled mine stirs Asian frontier'. https://www.reuters.com/article/uk-special-report-mongolia-mine-idUKLNE69B05T20101012 [accessed 25 April 2022].
3 COST Actions are funded by the European Cooperation in Science and Technology (COST). Their funding covers networking events (meetings, workshops), not new research. The 'Drylands Facing Change' COST Action (CA 16233) was chaired by Prof. Han van Dijk and co-chaired by Prof. Cyrus Samimi. Working Group 2 was co-led by Prof. Tobias Haller and Dr. Angela Kronenburg García.
4 The aridity index is the ratio of annual precipitation and mean annual potential evapotranspiration.
5 Although the Pamir Mountains in Central Asia are arid, FAO (2019) classifies them as 'presumed drylands'.

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Part I

Climate, environment, and narratives

2 Climate variability and institutional flexibility

Resource governance at the intersection between ecological instability and mobility in drylands

Han van Dijk, Cyrus Samimi, and Harald Zandler

Introduction

Drylands cover approximately 40% of the Earth's land surface, and around 40% of the world's population lives in drylands (Huang et al. 2017). In an ecological sense, drylands are defined by either low annual precipitation, or a long, distinct dry season, or a combination of both. Therefore, not only is the total amount of precipitation important but also its seasonal and spatial distribution. Additional inter-seasonal variability is a central characteristic of drylands. Often lower mean annual precipitation corresponds with higher variability of mean annual rainfall, a larger inter-seasonal distribution, and a more pronounced spatial variation. Ecosystems in drylands are well adapted to these patterns, but it impacts pastoralism and to a much larger extent rain-fed agriculture. Livestock can still be sustained if the dry spells are not too long. If the mobility of livestock is possible, even longer dry spells can be managed; crops, however, are heavily affected and will react with a reduction in harvest or even total crop failure—as shown for maize, a widespread crop in many drylands (Nnoli et al. 2020). Adaptation to climatic variability is therefore more difficult in cropping than it is in pastoralism. As a result, populations of drylands have to cope with food insecurity.

We will argue that precipitation variability has important consequences for the management of natural resources and the regulation of access to land, pasture, and forage. Typically, there are two main strategies to deal with these fluctuations. One is to make the system more resilient by investing in soil and water conservation, so that optimal use is made of available rainfall and water resources by storage in the soil or directing scarce water to specific places where pasture and crops can be produced. The second main strategy is to move humans and animals to those spots that have received rainfall and can provide pasture for animals and other products. In addition, specific areas can be reserved for times of scarcity, which requires coordination of movements of people and animals in time and space.

However, these two co-existing strategies require totally different rules and institutions to regulate access to resources. This difference applies not only in space but

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also in time. Mobility over large land areas requires constant renegotiation of access rules and common use of the land and its resources. These rules change over time with changes in rainfall conditions. Farmers and stationary livestock producers are faced with tremendous variety in crop and pasture production. Rainfall conditions may dictate different kinds of movements and cropping strategies in every year. These strategies also change in space as rainfall conditions vary. Where people invest in making production systems more resilient against the vagaries of the climate, different regimes are present to relegate 'access'—defined as 'the ability to benefit from things' (Ribot and Peluso 2003: 155) by an individual or a group of individuals who invested labour, capital, or other resources in land or other resources.

These two different modes of regulating access need not be in conflict if they can be separated in time and/or space. However, especially in areas where the systems are in contact with each other, coordination problems and conflicts between mobile herdsmen and sedentary land users are a regular occurrence (van den Brink et al 1995). In many cases, very complex management systems have emerged through cooperation and contestation among different user groups. These systems are under tremendous outside pressure (see Chapters 4–8, this volume). In addition, the variability of the climate and the consequences of climate change add another threat to the resilience of dryland natural resource management systems. As a result, it will be increasingly difficult to develop the conceptual tools for analysing common-property regimes and management on private land to deal with the complexity of overlapping rights, partial rights for pasture, and non-timber tree products such as fodder, fruits, and fibres.

In this paper, we will focus on this debate that connects ecological instability to institutional flexibility. We will first present an overview of the debate in dryland ecology, largely based on the lessons of non-equilibrium ecology, and the issues that emerge from these climate factors and the expected consequences of climate change. Thereafter, we will discuss some of the issues emerging from dryland ecosystem dynamics for institutions that manage drylands, and how they might move towards a framework able to encompass institutional flexibility by incorporating concepts such as territoriality and claim-making. They might form the basis to develop new analytical tools to analyse the regulation of access to variable resources and the existing ways of looking at institutional frameworks. Therewith, we want to emphasize that institutional flexibility has to be the basis for flexible land-use concepts, including mobility to enhance the adaptation capacity of the dryland population which faces threats by various processes such as climate change, land grabbing, mobility restrictions, and economic pressure.

Climatic and environmental variability: current status and outlook

Studies on observed precipitation changes and their links to climate change are not consistent. The reason is the lack of station data in many regions and the quality differences of gridded data (Zandler et al. 2019). Huang et al. (2017) show a drying trend in many drylands since the 1950s. Only parts of North and South

South America, northern Australia, and Central Asia see an increase in precipitation, all with huge variabilities. In a recent study on tropical and partly subtropical drylands, Abel et al. (2020) show a decrease also in Africa and South Asia. In Africa, only central Namibia and parts of Somalia are characterized by rainfall increases. Increases are also visible for Australia and north-eastern Brazil, while Mexico and the southern United States show a heterogeneous picture. A station-based analysis for Africa, covering more than 100 years in some locations, shows a downward trend, which is not statistically significant in all regions, and the time series demonstrate the huge inter-annual variability throughout the time span (Nicholson et al. 2018). Only in North Africa the stations show constant negative precipitation anomalies over the last decades. An analysis with ERA5[1] data for Africa since 1979, as an example, shows a different picture again. The Theil-Sen slope[2] estimator shows a statistically significant and considerable decreasing trend in Central Africa towards the eastern Sahel, in parts of West and East Africa, and in Lesotho. Most changes are small and not statistically significant (Figure 2.1). In Central Asia, another example, a slight increase in precipitation

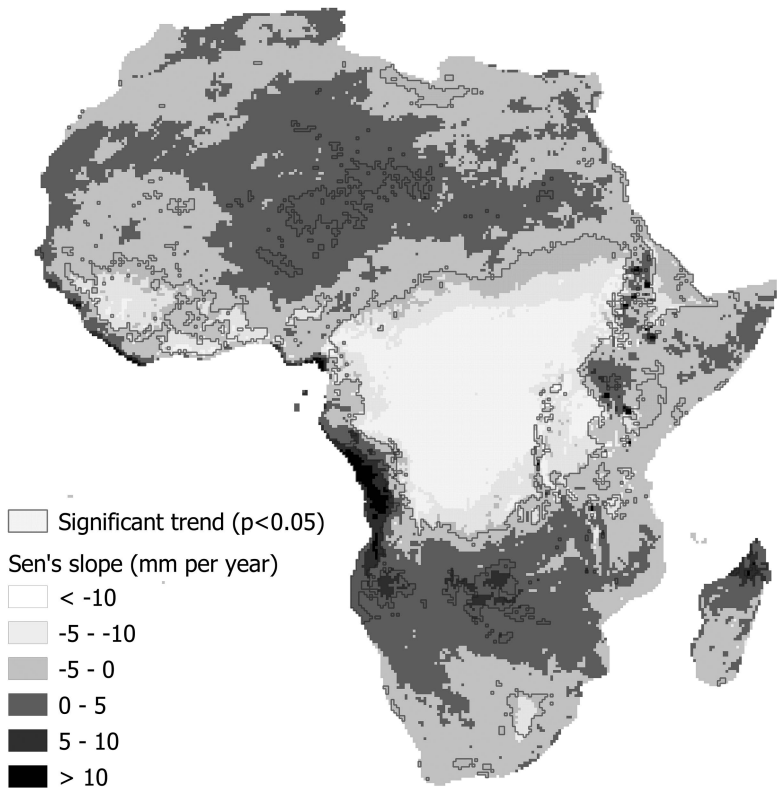

Figure 2.1 Trend of annual precipitation 1979–2020, based on ERA5 reanalysis data.

could be observed from 1950 until 2016, while the precipitation in spring is decreasing (Haag et al. 2019).

The reasons for frequently observed droughts such as those in the Sahel in the 1970s and 1980s, the eastern Mediterranean in 2007–2010, and California in 2011–2016, and whether they have a climate change signal is a focus in climate change attribution (Cook et al. 2018). The drought in the Sahel was linked to changes in sea surface temperature (Cook 2008), and rainfall increased after the droughts, yet with huge annual variabilities (Brandt et al. 2014). The very severe drought in Madagascar in 2019–2021 could not be attributed to climate change and shows that uncertainty and variability of precipitation are an inherent part of the climatology of drylands (Harrington et al. 2021).

Besides annual trends in intra-seasonal variability, shifts in the onset and end of rainy seasons are of the utmost importance for many human activities in drylands, because they determine the length of the growing season and the success of crops. The few studies on this aspect show that there are changes in rainfall patterns. Nicholson et al. (2018) show a change in seasonality of precipitation, mainly in equatorial East Africa. Dunning et al. (2018) provide a good overview of studies showing changes in seasonality, embedded in general trends of precipitation. Dry spells during the rainy seasons become longer in combination with higher rainfall intensities, as shown for most African drylands (Figure 2.2). Larger variabilities will increase the difficulties of people living in drylands and will have a huge impact on livelihoods, as harvests are impacted, and floods have frequent negative effects (Samimi et al. 2012; Dunning et al. 2018). The changing precipitation patterns in a climate that is already characterized by large variability make it difficult for local communities to adequately plan seasonal activities (Kassam et al. 2021), which is already a large challenge for climate change adaptation—and this challenge will increase (IPCC 2021).

The vegetation in drylands is largely inactive during the dry season, and additionally so in cold drylands in winter. The phenology of the vegetation follows warm and wet seasons with a distinct difference of woody and herbaceous species, which is also reflected in satellite data and indices such as the Normalized Differentiated Vegetation Index (NDVI).[3] The reaction of vegetation, and so of NDVI, shows a considerable annual variability, and therefore standardized remote sensing techniques have to be used wisely (Wagenseil and Samimi 2006). This is important for analyses of long-term developments of vegetation status. Besides long-term trends in vegetation characteristics and annual variability, the vegetation also shows an intra-annual reaction to rainfall. Especially grasses can respond quickly to dry spells and rain events. In cold drylands, the snow cover, with its large temporal and spatial variability, and the meltwater in spring are relevant for the vegetation (Zandler et al. 2020). Hence, the dynamics of the vegetation follow the precipitation variability to a large extent, with woody species showing a slower response. In addition to precipitation, other disturbances affect dryland vegetation, such as fires and herbivores. Human activities influence dryland vegetation to a huge extent—for example, through firewood collection or cutting of trees, fire management, reduction of wild herbivores, and animal husbandry.

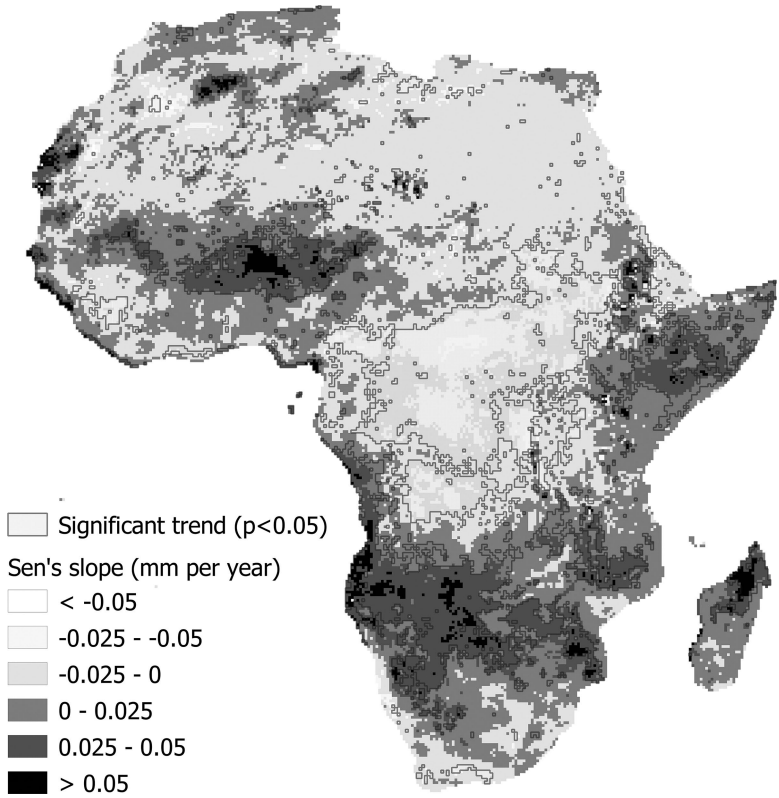

Figure 2.2 Trends of rainfall intensities 1979–2020, based on ERA5.

The dynamics of dryland vegetation are explained by the concept of non-equilibrium (Wiens 1984), which has been debated since its introduction. Illius and O'Connor (1999) criticized the concept with the argument that temporal and spatial scales are often neglected, and that dryland ecology follows an equilibrium state on a larger scale. One argument supporting their critique is the lack of grass recovery if systems are overgrazed for a long time. Sullivan and Rohde (2002) highlighted the importance of scales but gave various empirical and theoretical examples which justify the non-equilibrium concept. In a study in Mongolia, it was shown that scale defines equilibrium and non-equilibrium states in rangelands (Zemmrich 2007). All three papers agree that dry rangelands are characterized by large dynamics that require flexible concepts of resource use, and therefore both concepts, equilibrium and non-equilibrium, could be integrated depending on spatial and temporal scales.

As with equilibrium and non-equilibrium theories, browning and greening paradigms are discussed for drylands often as alternative stages (e.g. Helldén and Tottrup 2008; de Jong et al. 2011). Most regional and global studies on vegetation

changes use the NDVI from the longest available satellite time series starting in 1981 (GIMMS, National Oceanographic and Atmospheric Administration (NOAA) Advanced Very High-Resolution Radiometer (AVHRR)) and MODIS (Moderate Resolution Imaging Spectroradiometer) for studies since 2000. The greening debate first focussed on the re-greening of the Sahel, which followed the drought period in the 1970s and 1980s (Hickler et al. 2005; Giannini et al. 2008), but was then extended to global drylands (Fensholt et al. 2012). Again, we argue that temporal and spatial scales are of the utmost importance—like the time frame of the observed changes, which is mainly dependent on the availability of satellite data. Greening and browning could be observed in proximity if higher resolution satellite data were used (Brandt et al. 2014; Vanselow et al. 2021). For livelihood activities in drylands, the reasons for greening trends are also important. Many greening trends can be linked to an increase in woody species (Brandt et al. 2015; Saha et al. 2015; Tian et al. 2017). This propagates an increase in firewood availability and carbon sequestration but may reduce the grazing potential. Not reflected in remote sensing studies is the biodiversity, with a possible loss of usable plant species (Brandt et al. 2014, 2015). The causes for a change in dryland vegetation are many, as discussed above for the concepts of equilibrium and non-equilibrium, and could be linked to precipitation changes, changes in fire regimes, changes in herbivory, and CO_2 increases—all directly or indirectly influenced by human activities (Abel et al. 2020). In this context, long-term data based on the research of ILRI (International Livestock Research Institute) have shown that grazing often does not inflict long-term damage on dryland pastures (Hiernaux et al. 2009), while others show an impact especially in combination with a warming trend (Zhang et al. 2015). This shows again the complexity of dryland ecosystems in a changing climate.

Predicted changes in rainfall are often uncertain. Global projections show wetter conditions for the Sahel, Central Asia, the Middle East, parts of North America, and southern India, and drier conditions in subtropical drylands and southern Africa (IPCC 2021; Tebaldi et al. 2021). Projections of changes in precipitation are less consistent for Africa; they show a decrease in southern Africa and the western Sahel and an increase in East Africa (e.g. Serdeczny et al. 2017; IPCC 2021). Changes in the variability are predicted to increase (e.g. Dunning et al. 2018). Also, for other drylands, projected scenarios predict a greater variability in precipitation (e.g. Sun et al. 2022).

Ongoing climate change has been altering the conditions in drylands and the process will continue. The projected increase in parts of the tropics for the different RCPs[4] scenarios is slightly lower than in extra-tropical regions and much lower than in the Arctic. With an increase in mean temperature, it is highly likely that the incidence of hot extreme events will increase (IPCC 2021; Tebaldi et al. 2021). Parts of the drylands may become uninhabitable during the hot season without air-conditioning during such hot extremes (Suarez-Gutierrez et al. 2020). A downscaling for Africa of the global warming projections of 1.5°, 2.0°, and 3°C show a clear increase in hot extreme events, with the Sahel, parts of East Africa, and southern Africa affected the most (Weber et al. 2018). Scenarios also show

a clear increase of temperature with more extreme events that will change living and livelihood conditions (e.g. Serdeczny et al. 2017; Nangombe et al. 2018). Downscaled temperature projections for Central Asia show similar results, with an increase in temperature and heatwaves with regional and seasonal differences in strength (Qiu et al. 2022). Especially in high-altitude locations in Asia, temperature increases and related glacier retreats are of great concern because the irrigation in the Asian drylands depends on discharge from the mountains (Didovets et al. 2021). Downscaled precipitation scenarios also show changing patterns. Nikulin et al. (2018) predict increasing precipitation in parts of the Sahel and East Africa, and slightly decreasing to constant rainfall in southern Africa. The most important outcome of their modelling is a decrease in consecutive rain days but an increase in maximum consecutive 5-day precipitation and rainfall intensity (Weber et al. 2018). Downscaled climate models suggest an increase of annual precipitation in Central Asia, but this is compensated for by higher temperatures, and therefore drier conditions are predicted (Qiu et al. 2022). Drought events by the end of the century will likely also increase in frequency, length, and intensity, while up to the middle of the century the predicted intensity is lower, but with longer and more droughts (Guo et al. 2021). Again, the rainfall patterns tend to have higher intensities in spring, but with less precipitation intensities in summer and more dry spells (Dike et al. 2022).

The projection of the expansion of dryland ecosystems is less predictable than climate change because the shifts are multi-causal (Abel et al. 2020). Nevertheless, globally an expansion of drylands by 11% is expected for the RCP4.5 scenario (Huang et al. 2016). The combination of temperature and precipitation changes caused by climate change is also affecting biomes (Conradi et al. 2020), with expansion of biomes in Africa and a shift from wetter to drier biomes, which have a lower productivity.

Already observed and projected changes in the climate system of drylands clearly show that the variability of weather patterns, temperatures, and precipitation will increase and therefore enhance the variability characteristic of dryland climates; consequently, ecosystem responses will also show an increased variability. This will affect the livelihoods, food security, and health of people in drylands, who are adapted to the variability to a certain extent (Thalheimer et al. 2021). Restrictions in flexible adaptation strategies (e.g. via mobile pastoralism) and accelerated climate change may limit adaptation capacity, which in turn could lead to increased migration (e.g. Thalheimer et al. 2021). Up until now climate change is only one of many reasons for migration but is already affecting development (Li and Samimi 2022). Therefore, institutional flexibility is required to enhance the adaptation capacity in drylands.

The problem of institutional flexibility and ecological instability

This dynamic character of dryland ecosystems and the way in which people use resources in a flexible way were misunderstood for a long time. The main narrative

about drylands was that drylands were wastelands, rife with poverty and famine. In the first half of the 1990s, a paradigm shift in thinking occurred concerning unstable rainfall and rangeland ecology. Up until that point, aside from dissidents such as Stephen Sandford (1983), mainstream thinking about pastoralism and rangeland ecology was dominated by the assumption that pastoralism was inherently bad for dryland ecosystems. Pastoralists were accused of overstocking increasingly scarce pastures with too many animals for reasons of prestige (Herskovits 1926), thereby creating situations where these animals overgrazed these pastures to the extent that the pastures were severely degrading. Pastoralists were accused of being the creators of desertification and ecological decline. This thinking was very influential in explaining the Sahel droughts of the 1970s and 1980s, during which large numbers of livestock perished and enormous tracts of pastures and woodland simply dried out (Lamprey 1983; Mabbutt 1985).

This narrative assumed that every agro-ecosystem has a maximum sustainable yield based on measurable parameters following primary biomass production. Accordingly, livestock numbers and the level of exploitation should be adjusted to these parameters to sustainably manage drylands (Behnke and Scoones 1993). Proponents of this vision pointed at the vast tracts of dead forest and advancing sand dunes to underscore their point. In addition, overstocking led to a decrease in milk and meat production, such that domestic herds were performing at a suboptimal level (Breman and de Wit 1983). This narrative often motivated government interventions to curtail the freedom of nomadic pastoralists to move around and to limit their numbers of animals, in attempts to regulate and 'rationalize' the use of pastures (e.g. de Bruijn and van Dijk 1999; Davis 2005; Alene et al. 2021).

As was shown above, on the contrary, there are tremendous benefits attached to being mobile and flexible in drylands. Mobility, for example, allows pastoralists to bring their livestock to the place where pastures are best, where rainfall is concentrated, or where water is available for watering their animals. Given the variability of rainfall, these locations may not be the same throughout the year. Mobility also allows land users to deal with the seasonality of rainfall by grazing their animals in areas where rain has fallen, and fresh pastures provide nutritious pastures with high protein content. Mobility also allows the distribution of animals over the available pasture to reach the maximum possible stocking density. It was found that in this way, pastoralists were able to extract more energy from natural herding systems than American ranchers were (Coughenour et al. 1985).

In addition, this mobile form of resource extraction ensures that there is no overexploitation, contrary to desertification and overgrazing narratives (Hiernaux et al. 2009). Overexploitation would be illogical because animals and people always move to the best and freshest resources and do not stay put in areas where resources are exhausted, unless compelled by necessity (e.g. no water to move to) or political constraints on movement. A similar advantage of mobility applies to hunters and gatherers inhabiting drylands: they are dependent on grasses and on tubers that grow in specific places because of the interaction between natural conditions and rainfall, and they follow animals that move according to the rhythm of seasons and the availability of water.

However, the necessity of dealing with resource variability through mobility confronts society with the question of how to regulate access to the resources present in a given territory. Who is allowed to make use of pastures, wildlife, wild grains, tubers, fruits, and grasses from these drylands? And on what legal and institutional basis? Should society create boundaries? And if so, what kind of boundaries? How are they to be maintained? Who is to be allowed in and who is to be excluded? And on what basis? How do these mechanisms accommodate the required mobility and flexibility for the long-term sustainable management of drylands?

In short, the theory and conceptual tools with which we try to understand mobile exploitation of pastures, and the ways in which resources are appropriated, are not yet adapted to these new conditions of extreme variation and the flexibility that is needed by pastoralists. There is a vast literature, ranging from neo-Malthusian thinking—preaching doom for management regimes and lamenting the 'tragedy of the commons' (Hardin 1968)—to transaction-cost economics (Ostrom 1990) and institutional approaches (Leach et al. 1999). Constitutionality approaches that focus on bottom-up building of resource management institutions (Haller et al. 2015; Kronenburg García 2015) and political ecology approaches (Turner 2016) acknowledge the complexity of resource management regimes and take into account diversity, overlapping rights, and local knowledge.

However, in view of increasing climate variability and progressive climate change, there is a need to revisit this literature and to refocus on the nature of the resources managed and their variability as factors to be considered. In addition, the way in which resources are being exploited or used may play a decisive role in the establishment of the rules and institutions that mediate access to these resources. In large parts of the drylands, for example, rain-fed farming is impossible because of the erratic and low rainfall; consequently, use and exploitation of these drylands is possible only by means of hunting-gathering or extensive nomadic pastoralism. These forms of land use, rather than stationary modes of land use, place a premium on mobility.

These current frameworks for understanding and analysing institutions for natural resource management are based on a notion of boundaries and rights of use that are continuous, in the sense that a predefined group of people has specific rights to a given set of resources, within a given territory (Ostrom 1990). Theoretically, the stability of these resource management regimes is assumed to depend on various design variables, such as the stability of membership, homogeneity of group composition, clearly defined boundaries, and rules. Sometimes, as in the case of the management of mountain pastures, these boundaries are quite natural, being defined by the massif around which people live. However, in the case of nomadic pastoralism in flat areas (e.g. in parts of Central Asia and Africa) or in the case of multiple use (e.g. of wetlands), these boundaries, territories, and groups are fluid, as many studies have shown (Haller 2010). With fluctuations in rainfall, the size of the territory these groups need varies in accordance with biomass production. They may even use different territories in various years because of spatial variations in rainfall. Territories of distinct groups also overlap, and resource access regimes may also vary depending on the type of resources and the time of the

year (van Dijk 1996). It has also been observed that over time pastoralists such as the Fulani in West and Central Africa 'drift' from one region to another as they constantly adapt to new conditions, conditions related to climate as well as to the relations the pastoralists maintain with sedentary groups (Stenning 1957; Boutrais 1990).

Claims, territoriality, and practice

Therefore, we need to look at management not only as a social and political process of boundary-making and distribution, but also as a natural process in which herds of domestic animals have to be distributed over the available pasture and fodder resources in space at any given time. What we need is a kind of intermediate conceptual framework to better understand the connection between ecological conditions, herding (and perhaps even hunting) strategies as a natural process, and the ways in which mobile groups 'create' access to pastureland and coordination of herd movements as a sociopolitical process. In order to do so, it would be better to start from the perspective of mobility than from the perspective of institutions, boundary-making, and management. In this perspective, institutions, rights, and boundaries have a processual character rather than being fixed entities. They have to be constructed and remade constantly, not only by political negotiations, claim-making, and boundaries (cf. Kronenburg García and van Dijk 2020), but also through the practices of pastoralists and hunters-gatherers. We propose to do this by looking at two sets of twin concepts—property and access (Kronenburg García and van Dijk 2020), and territoriality and tenure (Ingold 1986)—to help us understand the dilemma between boundary-making and flexibility and the issue of different scale levels. Hereafter, we will look at herding and mobility as a form of territoriality and claim-making and at the possibilities to reconcile stationary forms of resource appropriation with mobility and flexibility.

Starting on the ecological side of the issue, mobility and territorial behaviour in general can be considered as functional adaptations to situations of resource variability—and all other forms of behaviour, such as conflict and aggression, are part of these functional adaptations. However, the process of appropriating pastures is also a sociopolitical one. Therefore, we need to better understand the role of ecological variability, and the connections between scales and mobility in the ways in which pastoralists access resources.

On the other side, private property rights are the most legalized and fixed way of distributing rights of exploitation of natural resources over the members of human society. In a Hobbesian view, they have been created to prevent a free-for-all situation in which there is the threat of a war of all against all and the degradation of the resources (Hardin 1968). Looking back in history and looking at the many conflicts and wars over territory and natural resources, property rights can also be regarded as a form of condensed violence. At the same time, property rights are a form of violence because they create two categories of people: those who have rights and those who have not. If necessary, these rights are sanctioned

by violence. Those who do not respect property rights are faced with violence (in the form of sanctions of any form) by the state or the group in which the property rights are vested. There can be no unlimited free riding as is the case in the natural state of humanity. In this reasoning, people have to be fixed in space in order to prevent conflicts and have to be assigned a position in the political order.

Ingold (1986) starts his discussion of the relation between the natural process of herding with the notion of appropriation. In order to get access to pasture and fodder, control first has to be established over a given territory. This control can be ritual, military, or legal, but also physical—for example, in the form of control over a water point such as a well (Thebaud 1990). In Ingold's vision, this appropriative act is largely symbolic and is a form of communication and contingent upon natural conditions. Territoriality is a form of resource access based on the act of appropriation and is defined as a succession of natural states (Ingold 1986: 186), a form of being and moving.

However, people operate not in isolation, in a pristine state of nature, but are part of society and encounter other people in their movements that restrict their mobility. This leads us to a first dilemma in the case of drylands and resource fluctuations that require mobility and flexibility. Too many restrictions on mobility (e.g. control over wells and associated territory) will inevitably lead to problems, as this will create too much difference between those that have access and those that do not at any given time (e.g. in the case of localized drought). In addition, the haves of today may be the have-nots of tomorrow if they encounter bad luck and are confronted with localized drought.

The first solution might be to enlarge the number of haves, by increasing the number of people and establishing tenure, which is defined as a system of social relations determining the rights that people have and that are vested in a group of people—what we typically call common property creating common resources (known as the commons). Yet, from an ecological point of view, this is an imperfect solution because it still restricts mobility through the creation of social and political boundaries. Here the issue of scale comes in. As is implied in the conditions of non-equilibrium ecosystems, there can be a form of equilibrium if we increase the scale (the space in which pastoralists are able to move) to increase the chances that each member of the group can be sufficiently mobile to maintain his herd. So, the manoeuvring space needs to be defined in a flexible manner.

A further issue is how to determine the membership of the group in which property is vested. Group (or ethnic) identity can also give rise to tensions and conflicts, especially if groups are defined at various levels, as segmentary lineages are. Here, the solution is to make group membership flexible and identities fluid, in order to ensure that individual herders have access to a sufficiently large territory and can be sufficiently flexible and mobile.

However, with both flexible boundaries of group membership and the space in which herdsmen can operate, we need another set of conceptual tools to do justice to the processual character of the rights and access to pasture, fodder, and arable land. We propose here conceptualizing property and access as a process of claim-making. Rights and access are constituted through a continuous process of

making claims. These claims can be legal and fixed in space, but also impermanent and renewable. They can be constituted through membership of a group, but also through being physically present and forms of communication (Kronenburg García and van Dijk 2020). The idea of claim-making also allows for fluidity and impermanence, because claims can also be lifted and transported to elsewhere.

Discussion: the nature of resources and management, and current issues for dryland inhabitants

Thus, the characteristics of resources matter. Drylands are characterized by high variability in rainfall both in time and space, and therefore the availability of pasture, fodder, and other resources requires flexibility and mobility of dryland inhabitants. Management of fluctuating resources can be conceived as a double process of, on the one hand, negotiation with nature, and, on the other hand, political negotiation with other dryland inhabitants and the outside world. As a result, the institutions mediating access to these resources need to allow for this flexibility and mobility and should have a processual and fluid character. For farmers, who are sedentary, other forms of flexibility should be developed that allow them to become more resilient.

First, this has consequences for social organization. Impermanent, unstable, and moving resources require a form of collective organization that will allow for collective appropriation but also for flexible membership. This will be more effective and reduce transaction costs such as patrolling. Therefore, membership rather than a relation with a specific resource will determine access. This will give rise to kinship groups, such as lineages, clans, and tribes—a common way of organizing society among pastoralists (e.g. the Nuer, Somali). These organizational forms require that the territory can be defended but should also contain political institutions that allow for negotiation and higher-order forms of organization that help to maintain flexibility and adaptability. This will allow dryland inhabitants to exploit large territories and deal effectively with non-equilibrium ecosystems and the patchiness of resources. Climate change makes this need for mobility and flexibility all the more urgent.

However, this approach runs counter to institutional development in modern-day drylands. Through modern state-making, increasing pressure on resources, creation of administrative boundaries, and associated authority over natural resource management, mobility and flexibility are increasingly hampered. Over the past decades, pastoralists have lost vast areas of open space to expanding farms, mining, and other causes (see Chapters 4–8, this volume). Sometimes these limitations on mobility are imposed on purpose to achieve assumed sustainability benefits, because of the supposition that mobile pastoralists are a danger to ecological sustainability. Governments also limit mobility to gain more political control over pastoralists, as the latter are considered to be 'unruly' people. In short, the prospects for the sustainable exploitation of drylands by pastoralist look rather grim. In contrast to that outlook, more institutional flexibility is required to enhance the adaptation capacity of the dryland population under

climate, economic, and political change. As discussed in the paper, the people in drylands have long-established concepts to cope with the climatic and ecological dynamic, and therefore it is of utmost importance to include local and indigenous knowledge into research but also planning through transdisciplinary approaches.

Notes

1 ERA5 is a climate re-analysis dataset of the European Centre for Medium-Range Weather Forecasts (ECMWF). Re-analysis data retrospectively combines various observations with state-of-the-art forecast models based on physical principles into a harmonized product. Studies found better performance of such datasets in regions with poor meteorological infrastructure compared with pure weather station-based products (Zandler et al. 2020).
2 The Theil-Sen slope represents the magnitude of a trend and is a more robust calculation method in the case of non-normally distributed residuals, compared with the common linear-regression trend estimation (Haag et al. 2019).
3 NDVI is an index ranging from -1-1 using the different reflections of vegetation in the red and near-infra-red spectrum. Healthy, dense vegetation has a high NDVI.
4 RPCs (Representative Concentration Pathways) represent changes in radiative forcing based on changes in greenhouse gas concentrations, used in climate modelling. The main RCPs are 2.6, 4.5, 6 and 8.4 W/m^2.

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3 Environmental crisis narratives in drylands

Jeroen Warner, Angela Kronenburg García, and Tobias Haller[1]

Introduction

Drylands are where the world's first civilizations developed and still sustain millions of livelihoods. Yet they are persistently portrayed in policy and development literature as marginal, fragile, disorderly wastelands, prone to desertification, overexploitation, and constraints on productivity. Drylands are instrumental to a range of current 'crisis narratives' such as climate change, migration, and conflict. Less conspicuous crisis narratives also underlie the Sustainable Development Goals (SDGs).

There are of course other, contending storylines celebrating resilient resources and resourceful pastoralists, making the most of the diversity and variability of their environment that 'induces an inherent ingenuity' in the dryland users (if still 'outsider' narratives). Meanwhile, persistent findings of increasing vegetation have started to appear, contradicting 'irreversible' desertification as an 'undisputed fact' (Sullivan 2000: 15; Reenberg 2012). The resulting picture led Behnke and Mortimore to claim:

> If desertification denotes an environmental crisis consisting of irreversible degradation on a sub-continental scale, then the most significant thing about desertification in the Sahel is that it never happened.
>
> (Behnke and Mortimore 2016: 3)

While quite successful in other domains, resilience narratives appear to have made few inroads into the prevailing Malthusian[2] crisis discourse on drylands. Framing situations as crises gives the latter an 'edge' over alternative narratives. Global narratives dominating agricultural policy, Kratli (2013) notes, rest on crisis scenarios, presenting drylands as 'wastelands' (Hoover et al. 2020: 37), not belonging to anyone, low on production efficiency, unable to meet future food demand, complicated even more by 'global climate change and food price spikes'. Crisis scenarios 'generate extra-ordinary consensus, open up new avenues of legitimacy and stretch thresholds for accepting sacrifice' (ibid.)—that is, when collective survival is at stake, people will accept more hardship than normally, even if it hurts them.

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Other elements of winning narratives (Box 3.1) like these are intuitiveness and an appeal to simple, causal, and explanatory beliefs (Molle 2008), clothed in neutral scientific language (Dreyfus and Rabinow 1982; Shore and Wright 2003). The basis of these narratives, however, may not be all that scientific (Sullivan 2000; Verhoeven 2014), though scientists' involvement provides an aura of 'scientistical' (Ribot 2004: 74) objectivity and truth and a buffer against counterevidence (ibid.).[3]

Not everyone has the same 'say' in what knowledge is (Sullivan 1998) and which knowledge counts. Indeed, these narratives have 'bankrolled decades of development interventions, research and international debate in drylands around the world' (Batterbury and Warren 2001: 3).

This chapter will examine the evolution of narratives in some of these domains: the myth of water and climate wars, the resource curse, the allure of energy transitions and the inconvenient effects it hides, and the misconceptions underlying the SDGs. In the field of the environment, some aspects of the global lexicon of sanctioned buzzwords and narratives tend to change at a breakneck turnaround speed, while others adaptively persist, mutate, or merge. Actors may pragmatically and strategically mix and match (elements of) institutions and related discourses to justify courses of action (Haller 2019).

We will briefly illustrate the 'life cycles' such labels and narratives go through—and assess the *effects* of such narratives. New narratives appear, take centre stage for a time, and then fade away, prompted, boosted, and buoyed by specific actors, coalitions, and epistemic communities. If received wisdom claims drylands are unruly, the implication is that they need to be controlled, regulated, and homogenized (Sullivan 1998). However, hegemonic narratives always leave spaces for contending narratives to be heard, opening up the scope for debate, and promoting 'polyphony'—the inclusion of many voices (Scott et al. 2018).

Box 3.1 Winning narratives

According to Kratli (2013) winning narratives contain the following:

1 A crisis scenario, to generate extra-ordinary consensus, open up new avenues of legitimacy and stretch thresholds for accepting sacrifice. The global narratives that have dominated agricultural policy are built on crisis scenarios around meeting projected food demand, now complicated by global climate change and food price spikes. The role given to drylands and pastoralism in these narratives shows little consistency, aside from characterizing them as lacking in some way—for example: unproductive, resource scarce, fragile, marginal, remote, and using resources that are uninteresting for other uses. A closer look reveals pastoralism's many positives. The increasing recognition that

pastoralist systems in the drylands can work with environmental variability, rather than against it, opens up an alternative storyline for global food security under climate change.

2 A logical structure firmly rooted in a world-view that is simplistic, powerfully intuitive, and widely held (e.g. the Malthusian argument on food and population; the 'tragedy of the commons'; resource scarcity in the drylands; economies of scale).
3 A politically neutral concern. Narratives are political in their making and operations but favour arguments that allow them to steer clear of the political arena and avoid inconvenient questions.
4 A fertile ground for programmes of scientific research. Support from scientific networks provides a narrative with the aura of apolitical authority associated with the objectivity of scientific methods, and it cushions the challenge from contrary scientific evidence.

Some theory on narratives

Environmental issues are almost inherently discursive, characterized as they are by 'a complex and continuous struggle over the definition of the meaning of the environmental problem itself' (Hajer 1995). Hajer has therefore championed looking at environmental policies through a narrative lens, as a framing contest. This narrative turn builds on thinkers such as Lukes, Foucault, Gramsci, and Bourdieu, who have contributed to the recognition that ideas and concepts articulated through discourses[4] and ideologies are part and parcel of the expression and effectuation of power. Ideas can have a direct political impact, and power relations are in large part about ideational processes, especially the capacity to convince other actors to mobilize and coordinate their efforts in a certain way because it is in their perceived interest to do so (Béland 2010).

Narratives provide a 'deep structure', filling uncertainty gaps in understanding the world we live in. Narratives are sense-making constructs on how situations and contexts have evolved, in which the sense-making is a precursor to action. Narratives persuade others to take certain kinds of action (Czarniawska-Joerges and Joerges 1988; Haller and Galvin 2011).

To make sense of the world, we cannot live without narratives, myths, and 'fairytales' (Van Eeten 1997). Narratives fill in the blanks to simplify and rationalize decision-making. They evolve in order to make sense of a messy reality and to point the way forward (e.g. development project discourse, conservation discourse, poverty eradication discourse). Policy narratives are 'scenarios (stories and arguments) that stabilize the assumptions for decision-making in situations of high turbulence and dynamics' (Roe and van Eeten 2004: 36).

However, some narratives are actively promoted internationally at the expense of others. Blaikie (2009) notes a reflexive relationship between the power of the author of the narrative and the narrative itself. A resonant narrative will have to be disseminated and concretized by social actors with divergent agendas. This

requires welding actors and discourses together as a discourse coalition, an *alliance* between catchy rhetorical devices, normative values, and sources of expertise. Those in authority have better means of broadcasting the narrative, as they have a network of allies and, if necessary, the means of coercion. 'Narrative framing' is a strategy to crystallize certain meanings at the expense of others, by developing narratives with a view to making a certain discourse of future actions hegemonic and legitimate (Haller and Galvin 2011). Once a narrative has become hegemonic, everyone will have to draw upon the hegemonic storyline if their contribution is to be taken seriously (Hajer 1995).

Narratives take the form of a story of how a situation came to be, and related discourses present a normative perspective of what should be done. Narratives thus have the following components:

1 –a beginning (e.g. assumptions, problem framing, and choice of issues)
   - intrigue and tension
2 –a development or 'plot' (e.g. argumentation, supporting evidence, justifications, troublesome side issues, and other relevant circumstances)
   - complications, reactions, resolution; and
3 –a conclusion: the moral (what should be done and policy recommendations on the way forward).

Narratives are thus populated with characters (heroes, villains, and victims) and their relationships/dynamics, entangled in plotlines, with complications, reactions, and a resolution. These plotlines unfold in particular settings (Scott et al. 2018) and have resonances.

Here, we look at a particular class of narratives – the crisis narrative:

> [a] rhetorical strategy by means of which the shadows of past catastrophes, or an impending one, are invoked to authorize particular forms of political power, or the use of collective power and resources, while depoliticizing the catastrophe in question.
>
> (Vázquez-Arroyo 2013)

Catastrophization—that is, invoking an impending catastrophe—lifts an issue out of normal democratic debate to life-and-death level, for immediate intervention with extraordinary measures (Warner 2013). In so doing, such narratives can be argued to set in motion an 'anti-politics machine' à la Ferguson (1990) (see e.g. Symons 2014). This fast-tracks measures and resources but takes place at the expense of a considerable loss of accountability.

Imaginaries

What Molle (2008) has called 'Nirvana concepts' underpin overarching frameworks that promote or strengthen particular narratives or storylines and that legitimize specific blueprints or models of both policies and development interventions. Nirvana concepts, narratives, and models/icons are 'all ideational

and ideological objects which emerge at some point in time to typify a certain view, approach, or "solution"' (Molle 2008: 131). These concepts and narratives are 'warmly persuasive' (Williams 1976) and endowed with 'almost unimpeachable moral authority' (Cornwall and Brock 2005). They create or strengthen

> social and political values and institutional practices that limit the scope of the political process to public consideration of only those issues which are comparatively innocuous to actors creating or reinforcing the narratives.
>
> (Bachrach and Baratz 1962: 948)

They are fed by 'imaginaries', which can be understood as the set of institutions, logics, values, and visions that spur ideas on what best fosters development in response to crisis narratives. The 'energy transition' is one such powerful imaginary (e.g. Movik and Allouche 2020).

Next to the paradisiacal 'attractors' we posit stand concepts and narratives with fear appeal—the 'repellents' spurring the idealized imaginaries. Environmental and climate mass migrations, environmental and climate wars, and deforestation and desertification myths are popular narratives, often rooted in colonial and Eurocentric beliefs of 'the South' as the site of backwardness, disease, and disaster (Bankoff 2001). Narratives of 'insecuritization' spread widespread unease and dread, and in so doing legitimize providers, 'dispositifs', and infrastructures of protection and defence. Securitizing (Buzan et al. 1998) and catastrophizing/crisification narratives (Ophir 2010; Warner 2013) open up space for radical change but also for authoritarian clampdown (Lebel et al. 2005; Pelling and Dill 2010), by calling into being a live-or-die situation overriding all other considerations, procedures, and checks and balances, seeking to jolt authorities into immediate, extraordinary defensive action.

The spread of ideas through policy transfer

Crucially, narratives travel (Gabriel 2016), among organizations and discourses; they can 'colonize other narrative spaces, they grow, they shrink and eventually they die' (Gabriel 2016: 209). The study of the 'social life' of narratives (Molle 2009) is closely related to several strands of policy-transfer studies

> concerned with the process by which knowledge about policies, administrative arrangements, institutions and ideas in one political system (past or present) is used in the development of policies, administrative arrangements, institutions and ideas in another political system.
>
> (Dolowitz and Marsh 2000)

Policy transfers contribute to policy convergence and can be spurred by a range of processes, including *emulation* (borrowing and adapting ideas and policy approaches or tools), *penetration* (when transfer is the result of coercion or injunction

to conform), *harmonization* (made necessary owing to political interdependence), and *transnational policy communities* of experts and professionals

> that share their expertise and information and form common patterns of understanding regarding policy through regular interaction (international conferences, government delegations and sustained communication) […].
> (Stone 2001)

Relevant organizations in this process may be think tanks such as the OECD, UN agencies (e.g. UNESCO, FAO), aid agencies (e.g. American USAID, German GIZ), consultancy firms (which 'package' reports and recommendations according to the lexicon used by the agencies and ministries that employ them), international NGOs (e.g. World Wildlife Fund, International Union for the Conservation of Nature and Natural Resources, International Rivers), academia, the various promoters of regional and global expert meetings (e.g. on water), and multilateral development banks (most prominently the World Bank).

While adopting policy ideas may be an explicit conditionality for receiving aid, such policy transfer may feel anything but voluntary when not presented as a conditionality. Transnational actors have the direct capacity to influence national policymakers largely by shaping their perceptions of what is good for them (Biersteker 1992; Orenstein 2008). Gatherings such as bi-annual COP global climate conferences and the triennial World Water Forum are conveyor belts for such ideas (Warner 2000; Mukhtarov 2014). Strategic elements in this endeavour are 'emulation', institution shopping, and selection of related ideologies with discourses and narratives, and 'penetration' (the activation of legal and legitimacy-producing ideologies). Especially, when it is a case of 'one-size-fits-all', this can be entirely inappropriate for the recipient context (Stone 2017).

Words themselves do not shape or change social reality; they need to be spoken in a complex context to 'work'—that is, to be 'performative'. To be 'felicitous', a 'speech act' needs to be spoken from a position of authority and resonate with the historical and cultural context of its intended audience (Austin 1975). While there is an obviously asymmetrical power relation between speaker and audience, the audience is not entirely powerless. As Butler (1997) has shown, meaning is not fixed and rigid; a speaker cannot control a hearer's interpretation, and a hearer can subvert and 're-inscribe' the intended meaning to perform differently.

For counterclaims to make an impact, they will need to develop into coherent counternarratives, which by their existence draw attention to the fact that there is a hegemonic narrative in the first place. In this sense, Gabriel (2016) claims, narrative and counternarrative require, co-create, and define each other. Stories of suppression will only reinforce the persuasive power of counternarrative (Gabriel 2016); see also our 'water wars/peace' example below. But suppression is not necessary; 'rendering technical' (Li 2011) appears to be a potent process to obscure and depoliticize a narrative and to make it travel. Let us see how this works.

Depoliticizing narratives

Just as in the world of politics, where words such as *reform*, *modernization*, *productivity*, *competitiveness*, *flexibility*, and *value creation* are used as assumedly neutral, positive, and desirable terms and contribute to depoliticizing a debate, the environmental world is permeated by a number of such concepts—for example, the *water–food–environment nexus*, *energy transition*, and *benefit sharing*. Another example of a globally hegemonic 'applause' concept is 'resilience', which has remained wildly popular despite having been amply shown to cover a multitude of sins and legitimize state retreat. The meanings that such buzzwords and labels acquire implicitly tell a larger story. Resilience, for example, implies that we have become too dependent on the welfare state, which has repressed people's own resourcefulness, and this resourcefulness will supposedly manifest once we give people space to show their true selves (Grove 2014).

The following examples will focus on:

1 the selection of discursive elements in a narrative
2 the interpretation and presentation of these elements as a convincing narrative ('label')
3 the use of scientific and expert information to strengthen the narratives and its extensions to discourses
4 the rise, reproduction, and (if any) decline of a (counter)narrative
5 the effect of narratives 'on the ground'.

The water wars narrative

The media-friendly 'water wars' narrative appeared after the fall of the Berlin Wall. It combines a Malthusian scarcity narrative with a Hobbesian state-centric anarchy narrative, leaving no choice but top-down intervention in (potential) conflict zones, the prime candidates for which are all in drylands: the Middle East, South Asia, and southern Africa. Kaplan's (1994) popular 'New Anarchy' article, a hallmark of this narrative, notably depicted Africa as a dreary place, fraught with chaos, violent contest over scarce resources, desertification, and deforestation. With global environmental consciousness on the rise, there was a receptive audience for doomsday scenarios such as that of the Club of Rome (Meadows et al. 1972).[5] These scenarios began to focus on water when the 1977 UN Mar del Plata conference highlighted local scarcities, but things really took off in the 1990s with Gleick's *Water in Crisis* (1993), which was updated annually. A host of books and articles followed in the 1990s, carrying a simple 'Water wars' title, echoing also in NGO and politicians' discourse.

At the time, riparian states made belligerent noises over both the Nile and Euphrates, while Israel saw its Palestinian 'water intifada'. While passions ran high in the 1990s, it certainly cannot be ruled out that garnering international attention and lavish funding was part of the contesting governments' plan. Attention and funding came in large doses as the Clinton Administration established an

environmental security directorate at the US State Department, and the UN and bi-national donors funded the Nile Basin Initiative, including large infrastructure. To our knowledge, the Jonglei Canal project in Sudan is still on the agenda.

Four major university groups—based in Oregon, Toronto, Oslo, and Geneva—have carried out decades of extensive research seeking to link resource scarcity to violent conflict, including water wars. None of these groups managed to find a solid relationship between scarcity and violent conflict.

The water wars narrative has never gone away; it gets repeated in media stories every so often and has re-emerged as 'climate wars' (Welzer 2015). A 'growing consensus of global warming as a driver of violence' (Verhoeven 2014:786), as most recently expressed by European Commissioner Timmermans (Harvey 2021). The civil wars in Darfur, Sudan,[6] and Syria have been labelled climate wars (refuted for Syria by Selby 2019). Notably, however, water scarcity was *not* the key issue in these countries. On the contrary, it can be argued with equal force that water scarcity has brought countries together (e.g. in East Africa) rather than caused war.

Indeed an influential 'water peace' counternarrative from Oregon's Aaron Wolf (Wolf 1995) has appeared, claiming, so far without serious contest, that countries have not fought only over water; even the 1967 Six-Day War was primarily about non-water issues. Wolf's narrative has spectacularly reversed the water wars narrative. Nevertheless, the 'water peace' argument does seem only to have reinforced the search for water wars' potential in order to prevent such wars.

The prediction of water wars in drylands has taken a continuing hold on researchers and government and UN agencies. In 2019, The Hague Water, Peace and Security initiative, involving well-regarded The Hague-based institutes such as the World Resources Institute, IHE, the Clingendael think tank, and Deltares consultants, is funded and tasked by Dutch authorities to predict resource conflicts and migration flows. In the process, they reproduce the image of the problematic South (water conflicts somehow never take place in Europe) and invoke the spectre of coming catastrophes. Presented even to the UN Security Council, the consortium promises an early warning tool using climate data to predict 'conflict hotspots'. Given that an explicit action link with the military is made in the baseline report, one wonders whether pre-emptive intervention is also on the menu.

The Sustainable Development Goals narrative

The SDGs narrative, recently (2015) produced by the UN General Assembly, comprises a set of 17 interlinked global goals designed to be a 'blueprint to achieve a better and more sustainable future for all', to be realized by 2030.

While the Millennium Development Goals (MDGs) are still far from realized, the new environmental crisis narrative propagates a claim that the crisis is produced locally and that (under)development issues need to be viewed as entwined with environmental issues. As Escobar (1999, 2005) shows, these terms have been defined externally to the global South and, especially, dryland areas.

This narrative not only flows from a Malthusian storyline of poverty and hunger induced by overpopulation and underdevelopment, similar to the above water wars narrative; it is also based on the premise of 'independent' sovereign states free to choose their development path as a matter of just getting the right projects implemented, rather than on problems of local unequal resource ownership relations and global exploitative systems. Local actors (the rural poor and pastoralists) are framed as the problem, and states should fix their destructive actions by addressing the 17 SDGs and a plethora of sub-goals. These goals range from the eradication of poverty and hunger, and via health and gender issues, clean water and energy, working conditions, industries and infrastructure, to clean cities, responsible consumption and use of land and water, and the reduction of CO_2 emissions.

Four of those goals especially—inequality reduction, peace, justice, and labour relations—invite issues of power analysis but are void of any such analysis, while the approach to participation in dealing with these topics is on the level only of what states will do. There is no attempt to analyse local realities or to reflect on how inequality was created and is perpetuated in the first place, no power analysis on what triggers continued conflicts, and no attempt to identify who defines participation.

Specifically, the SDGs do not address property rights issues, the dismantling of common-property systems and institutions and their transformation into state and private property since colonial times. Furthermore, the SDGs do not engage with continued multiple resource grabs (Allan et al. 2012) by states and companies, legitimated as beneficial development based on Corporate Social Responsibility (CSR) schemes since the global food, finance, and fuel crisis of 2007–2008 (Haller 2019; Gerber and Haller 2020), and worsening underlying poverty *and* environmental degradation. Last but not least, there are no gender and local-level minority-specific reflections in the SDGs on involving local innovations or crafting innovative local institutions for resource governance (see Haller, Acciaioli and Rist 2016).

A literature study (Haller et al. 2018) confronting SDGs with newer publications in social anthropology, geography, development studies, political ecology, and political science revealed that the SDGs would need at least a reformulation and a more bottom-up approach to make these goals truly sustainable (Box 3.2).

Box 3.2 SDGs deconstructed

- The selection and combination of 'poverty out of the blue' and the persuasive combination with environmental degradation that obscures power constellations, as analysed by political ecologists (see Robbins 2004; Blaikie and Brookfield 2015), marks the beginning of the SDGs narrative centred on states and investors as main actors to fulfil these goals.
- The SDGs present the convincing hegemonic narrative that the environment has to be fixed now, which is based on a labelled 'pure

nature' ideology, as if no people had ever lived in these environments, as if these were not cultural landscape ecosystems (see Fairhead and Leach 1996), and as if there has been no local development, no property rights institutions, and therefore no resource management—but only a 'tragedy of the commons'. The ideological basis is therefore not just that these lands are *terra nullius* (no one's land) but *terra nullius naturalis*.

- The SDGs are based on disconnected, scientific expert-driven natural science and neoliberal economics narratives from scholars who are legitimate champions in their field but are used to producing a scientifically legitimate framing of the crisis.
- Finally, the SDGs are also 'productive', as they legitimate 'grabbing' processes in the framing of conserving the environment and ushering in an environmentally sound resource governance and management based on new legal environmental-friendly frameworks (Larsen et al. 2022). This can be seen as 'institution shopping' (Haller 2010) on the part of powerful local, national, and international actors. They have the option to use these narratives and the discourses emerging from them to tap state and international funding.

The energy transition narrative

The energy transition narrative can be traced back to Germany in the 1980s, when the term *Energiewende* (Ger. 'energy transition') was first coined (Krause et al. 1980). The term entered the German policy debate for the first time following the Chernobyl nuclear accident in 1986 (Leipprand et al. 2016). Four decades later, the term has spread across Europe and around the world; and although at first it was linked to the anti-nuclear-power movement (Leipprand et al. 2016), today the energy transition narrative is largely an imaginary that speaks to the climate (change) crisis narrative.

In the energy transition narrative, the problem is climate change and the use of fossil fuels (the villains in the story), and the solution is a move towards renewable energy sources and e-mobility (the heroes). The narrative fits into a larger debate on climate action and is supported by scientific projections of global warming and the catastrophic impacts if insufficient action is taken to reduce fossil fuel (carbon) emissions (IPCC 2018). 'The future' looms large in climate change studies and debates, and 'sustainability'—a concept that means different things to different people—has emerged as the way forward to counteract this apocalyptic future (Bryant and Knight 2019). The energy transition narrative resonates with these debates, as it contains a vision of a decarbonized and sustainable energy future.

The energy transition narrative has entered the public and policy domain in the global North. Following the 2015 Paris Agreement, the EU, for example,

committed to climate neutrality by 2050 and in the European Green Deal (the EU's overarching climate policy framework), a pathway towards a 'sustainable future' was set out, including provisions for a transition to clean energy (EC 2019 COM 640). However, in stressing the urgency of climate action and the 'good' (High and Smith 2019) of the energy transition, certain struggles and dynamics go unnoticed. Energy transition policy narratives influence consumer demands, restructure global markets, and travel beyond the policy world to the private sector. Companies and investors, in turn, react to energy-transition-influenced market changes by developing new technologies and rushing to the areas that hold the resources (wind, sun, minerals) necessary to bring about the energy transition, often in the global South, including in dryland areas. The largest renewable energy projects in Africa with European investors—for wind power in Kenya (Cormack and Kurewa 2018; Achiba 2019) and a solar project in Morocco (Ryser 2019)—are both located in drylands; they are also both controversial projects accused of local land grabbing (see Chapter 7, this volume). Projects such as these tap into an energy transition narrative and the closely related 'green' rendition of the SDG (particularly SDG 7, which promotes clean and sustainable energy) to legitimize their investments. However, such powerful global narratives typically hide detrimental impacts, especially at the local level.

Policymakers tend to be country-centric—Eurocentric in the case of EU policymaking—focusing on changing the businesses, households, and behaviours of their citizens, while paying less attention to the corporate responses and problematic consequences that their policies may have in other parts of the world. One of the sectors that have been heavily targeted by European energy transition policies is the transport sector, in particular the automotive industry. On the one hand, this is because road transport accounts for most of the emissions in the transportation sector (EC 2016 COM 501); on the other, it is attractive for policymakers to focus on a specific industry (ICTSD 2017), as it offers a simpler target compliance (Kent Weaver 2009). It follows that numerous countries and cities in Europe have announced future bans on petrol and diesel vehicles. These announced bans, in combination with policies such as the plan to roll out a European network of publicly available electric recharging points (EC 2016 COM 501), have contributed to an increase in the demand for electric cars. Also, European citizens feel 'good' about contributing to the energy transition by acquiring an electric vehicle.

Key minerals required for the rechargeable lithium-ion batteries of electric vehicles include lithium and graphite, and these are both found in dryland areas. Most research has focused on the 'lithium triangle' in the Atacama Desert and neighbouring dryland areas of South America (e.g. Agusdinata et al. 2018). Graphite, however, which the EU declared a 'critical raw material' in 2017 (EC 2017 COM 490) and which is found in the southern African drylands, remains largely unstudied; hence its local impacts have been neglected to a large extent. Northern Mozambique has one of the largest deposits of unexplored, high-quality graphite in the world. Over the past years, this dryland region has seen a corporate rush by graphite mining companies. Graphite mining, however, often involves the displacement and resettlement of local populations. It is widely acknowledged

around the world that people's livelihoods are frequently undermined and social life irrevocably disrupted after resettlement (Cernea 2003; Vanclay 2017). Mining-induced displacement and resettlement are thus among the hidden effects of policies geared towards an energy transition.

Unlike other narratives discussed in this chapter, which claim to describe or intend to 'fix' a drylands-specific problem, the energy transition narrative targets a global challenge. Nevertheless, it circulates primarily in the global North (there is no energy transition debate in Mozambique, as of writing in 2020). Yet the narrative informs policies and investments that have far-reaching indirect and problematic effects in dryland areas, which may be minor in relation to the historical and contemporary impacts of the fossil fuel industry in the drylands (e.g. coal mining in South Africa, oil prospecting in the Okavango Delta) but nevertheless need to be discussed. This is not to say that the energy transition narrative causes nothing but problems—indeed, it also creates opportunities and brings benefits; but because it is framed as being inherently 'positive', it tends to brush aside the cross-scale politics and inconvenient effects of a process that is complex and heterogeneous, in the name of the fight against climate change.

Discussion and conclusion: ears to the ground

Discourses help us make sense of chaotic reality, but they come at a cost: their normative content is far from neutral, and the sender is not merely mediating the narrative. Discourses have consequences: in the case of drylands, these consequences often lead to policy action intended to minimize variability and heterogeneity in the environment (Hoover et al. 2020). Rendering narratives in technical and scientific jargon lends force and felicity to development narratives; at the same time, counternarratives can evolve, subverting or challenging and uncovering hegemonic narratives.

In narratives and discourses, certain words, labels, and images are chosen as 'hooks'. For example, the narrative of local environmental destruction of 'pure (pristine) nature' by local people (i.e. poachers) and the discourse of conservation in the form of fortress or top-down 'co-management' are loaded with words. The narrative of 'wasteland' and the discourse of sustainable green development that can be realized there (see also Gerber and Haller 2020) legitimizes the denial of common-property rights and the use of common-pool resources in these areas, as if they can be 'grabbed' for free. Examples are solar or windmill fields in Morocco and Kenya.

An especially powerful hook propelling a narrative is the crisis label, a 'claim of urgency employed to characterize a set of contingencies that, taken together are assumed to pose an immediate and serious threat' (Spector 2020: 1). Proctor urges us to ask if the claim-maker benefits from the crisis label, from the events that are bracketed in or out and how this is legitimized. A crisis legitimizes problem-solvers—for example, the 1990s water-war narrative legitimized US military deployment in various 'hotspots'.

We have provided brief examples of pervasive drylands narratives, or global narratives with effects in drylands, that are power-blind, a-historic, ignore highly unequal distributive outcomes and are often based on assumptions that are plainly wrong. They reflect a deliberate or more subconscious elimination, obfuscating power relations (cf. Ferguson 1990). Among these narratives, the SDGs and Paris Agreement on climate change are quite recent, both surfacing in 2015, but older narratives such as the energy transition and water wars have proved persistent. These narratives, however, are not immutable; they may change, receive new meaning (energy transition), be challenged, or be overtaken over time in response to challenging narratives. For example, exploiting competition between donors may provide spaces to challenge or modify conventional development wisdom. It has indeed proved possible to challenge the anti-politics processes with alternative discourses for development in co-conservation schemes (Galvin and Haller 2008), land-based investments as commons-grabbing processes, and the development of bottom-up alternatives; these possibilities spark hopes of viable counternarratives.

Counternarratives can successfully find discursive alliances, though not necessarily followed up by more than symbolic action. The water wars narrative of the 1990s was contested by a liberal-institutionalist (power-blind) water peace narrative, while in the desertification domain, ideas about indigenous technical knowledge and common-property management rules became current in the aid bureaucracies (Swift 1996). Such counterpoint has not been particularly audible in the domain of the energy transition and SDGs; however, governments in the global South, such as Mozambique, are asking themselves why they should transition to renewable energy while sitting on deposits of coal, when the global North relied on this fossil fuel to strike it rich. We note that counternarratives often bring an explicitly historical lens that unsettles the dominant narratives.

Highlighting such emerging domains—where empowering drylands narratives remain uncontested and fossilized and their effects on the ground obscured—can help to reveal how narrative space is taken up, challenge these narratives, and uncover budding counternarratives. An analysis of power relations in the selection and the shaping of narratives—for example, with the help of Gaventa's (2006) Power Cube—may also point to the conditions and niches for a more inclusive co-shaping of narratives, an unveiling of voices, and an imagining of alternatives that otherwise remain hidden from sight.

To be clear, narratives can be useful and productive, mobilizing people into necessary action. Analyses such as those in this chapter risk picturing the arena as one of the misguided narratives contested by worthy counternarratives. In real life, narratives and counternarratives form a discursive ecology, a nexus of all kinds of interacting discursive life forms in various stages (Gabriel 2016). Subaltern counternarratives are not, by definition, more equitable and sustainable than dominant ones. Also, to highlight depoliticizing processes is not equivalent to calling for re-politicization of everything. Extreme politicization can lead to ritual 'tribal' standoffs for the sake of opposition, as we are currently witnessing in US politics.

Nevertheless, obscuring the strongly socially distributive effects of discourses and the interventions they legitimize can be no less destructive. Showing how dryland narratives occupy spaces and render value-laden ideas technical may help to make such narratives and attendant policies more polyphonic, thus '(re)politicizing' them in the sense of 'the imagination of alternatives' (Guzzini 2005).

Notes

1 We thank Martina Bozzola, Svetla Bratanova, Cyrus Samimi and Han van Dijk for engaging with the authors about the chapter and Jesse Ribot for his thoughtful review of a previous version. All ideas and argument contained here are of course solely the authors' responsibility.
2 After Thomas Malthus (1766–1834), who assumed that exponential population outpaces the linear growth of available resources, leading to a steady reduction in living standards and, to some, inevitable violent conflict.
3 Ferguson (1990) has shown the importance of policy discourses in depoliticizing development problems into technical problems that can be solved by the development business. In the process, territories are simultaneously turned into objects in need of intervention. See also Engström and Hajdu (2018).
4 Discourse is defined as '[a] specific ensemble of ideas, concepts, and categorizations that is produced, reproduced, and transformed in a particular set of practices and through which meaning is given to physical and social realities' (Hajer 1995: 60) or '*an institutionalised way of talking that regulates and reinforces action and thereby exerts power*' (Link 1983: 60, in Wodak and Meyer 2015). Discourses not only express how social actors envision the world, but also significantly contribute to how they shape and constitute the world (Wodak and Fairclough 2004). A discursive formation is like a screen on which hopes and fears, perspectives and demands are projected (Torfing 1998). For this formation to gel, concepts necessarily have to be somewhat ambiguous, nebulous, so that it can be 'all things to all people', uniting disparate interests in a 'concept of control' (Overbeek 2004). This interpretative flexibility however also makes such concepts bound to disappoint (Warner and van Buuren 2011).
5 The Club of Rome is a private foundation established in 1969 by a group of European scientists concerned about the future of the globe. Their 1972 report, *Limits to Growth*, caused a global stir.
6 'Water scarcity root of Darfur conflict': https://www.voanews.com/africa/water-scarcity-root-darfur-conflict [Accessed 2 March 2021].

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Part II

Resources, institutions, and power

4 Wetlands in drylands

Large-scale appropriations for agriculture, conservation, and mining in Africa

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Introduction

In regions where water is scarce, wetlands stand in stark contrast to the surrounding dry environments. 'Wetlands in drylands' come in many forms: they may be large and linear as they follow rivers (floodplains, riverbanks, interior deltas) or small and dotted across the landscape (isolated inland lakes); they may be permanent or temporary, and disappear (due to siltation) or appear in new places; they include highland swamps and lower-lying areas where rainwater accumulates or streams converge; and they may be modified by small-scale users through the excavation of wells, the construction of small dams, and the digging of canals or ponds. In a context where rainfall is low, unpredictable, and seasonal, wetlands are key for human life because they remain wet throughout—or at least far into—the dry season, and during periods of drought they may be the only source of water available in a wide region. The presence of water also means that other important resources accumulate in and around wetlands (e.g. fish, pastures, fertile soils, and wildlife) and become useful to people, depending on the period of the year. Wetlands thus constitute a crucial source of livelihood for people living in the drylands, and to benefit from them local populations have developed institutions that allow for the flexible, seasonal, and common use of resources (Scoones 1991; Adams 1993; Woodhouse et al. 2000; Haller 2010a; Haller 2016).

Because wetlands in drylands hold such valuable resources and act as safety nets in times of drought, they are prone to conflict and competition (Scoones 1991; Woodhouse et al. 2000; Haller 2016). Conflicts may arise from resource pressure and resource use overlap (e.g. due to population growth), resource scarcity (e.g. drought), or because resources gain economic value and become attractive to new, commercially oriented actors (Scoones 1991; Woodhouse et al. 2000; Haller 2010a, 2010b). The literature has identified a variety of changes that may underlie these conflicts: climate change (affecting resource availability, such as that of fish); greater commoditization, monetization, and commercialization of

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resources; diversification, intensification, and expansion of wetland agriculture for cash cropping; government and donor-sponsored 'development' projects and schemes that introduce new technologies (e.g. pumps) and management systems (e.g. paddocked grazing schemes); growing demand for rice and other crops due to ongoing urbanization; and, last but not least, institutional changes since the colonial period that gradually eroded local institutions of access and use (Scoones 1991; Adams 1993; Woodhouse et al. 2000; Brouwer 2002, 2014; Haller 2010a, 2010b, 2016).

The literature on wetlands in drylands has mostly focused on the resource use dynamics that emerge from the gradual and diffuse processes of rural differentiation, market integration, and institutional and agrarian change described in the previous paragraph. Less studied are the large-scale interventions and investments that suddenly appropriate or claim control over whole wetland areas (or large parts thereof) and that interact with these processes of rural change. Whether in the name of development or conservation, or for the private gain of companies and investors, these interventions dramatically affect local access and resource use. In this chapter, we present three cases of large-scale appropriation of wetlands in Africa and discuss what they *do* on the ground to the wetlands and dryland populations. We contribute to the 'wetlands in drylands' emerging field of study that recognizes the importance of wetland use for dryland livelihoods, especially during droughts and dry seasons, highlights the seasonal complementarity of wetland and dryland resources, and thus approaches wetlands as an integral part of wider dryland resource use systems (Scoones 1991; Adams 1993; Brouwer 2014).[2] Each case of wetland appropriation will illustrate a process of change related to resource use, institutions, and livelihoods. The first case, on large-scale irrigation schemes in the Sahel, will illustrate a process of rigidization of resource use and is based on the work by authors Marina Bertoncin and Andrea Pase, who together with colleagues studied several irrigation projects between 2000 and 2018 in the Lake Chad region (Nigeria and Cameroon) and along the River Nile in Sudan. This research has been published in a number of works (Bertoncin and Pase 2012, 2017; Bertoncin et al. 2015, 2019, 2021). The second case, on conservation in Cameroon, exemplifies a pathway of institutional change (from common property to state property to open access) and is based on fieldwork carried out by Gilbert Fokou in and around the Waza National Park in the Logone floodplain in 2005–2006, which was supervised by author Tobias Haller and published as a book chapter (Fokou and Haller 2008). To complement this work, we also draw from two publications (Kelly 2013, 2014) based on more recent research (2008–2011) in the same area. The third case, on mining in Mozambique, will show how wetland appropriation may lead to less resilient livelihoods, and it draws from field research carried out by authors Angela Kronenburg García, Sá Nogueira Lisboa, and Luís Artur in 2018, which followed the public consultations on resettlement and compensation in the context of a new mining project in a wetland area. It also draws from an analysis of resettlement planning

documents and studies commissioned by the mining company. This research has not been published yet.

Institutions and wetland resource use by dryland populations

Junk et al. (1989) and Odum et al. (1995) have referred to wetlands in drylands' hydro-periods as 'pulses'.[3] The strong seasonality of rainfall in the drylands endows wetlands with a seasonal pulse and the year-to-year variability (i.e. droughts) with an inter-annual pulse. In floodplains, for example, seasonal rains (locally and in remote mountainous areas) feed the rivers so that large areas adjacent to the rivers inundate; towards the dry season, the water gradually retreats to the riverbeds. The rainy season and the flood season do not coincide; in the Sahel, for example, the rainy season is between June and September, while the floods are between September and December. This succession of seasons allows for the availability of different natural resources throughout the year, while the dynamic of flooding and recession gives local users differential access to resources, which may vary from year to year (Haller 2010a). Based on knowledge developed over time, dryland populations have adapted to this highly variable pulsing dynamic with flexible, mobile, and multiple resource uses, which, in turn, have shaped these landscapes and infused them with cultural meaning (Haller et al. 2013). Wetlands may be used by single user groups or by different groups for farming (wetlands hold rich soils), for the grazing of livestock, for fishing, for hunting and gathering, and for wood collection (Scoones 1991; Adams 1993; Haller 2010a, 2016; Bertoncin and Pase 2012; Brouwer 2014). In some places, wetlands accommodate sacred sites, such as cemeteries and prayer sites.

Wetlands function as 'pools of resilience' because they provide common-pool resources that may be vital for the survival of sedentary and mobile dryland populations (Haller 2016).[4] Common-pool resources include fish, pastures, wildlife, woodlots and natural products (e.g. honey, edible herbs, and roots), fertile soils, and water for agriculture (Haller 2010a; Haller 2010b; Haller 2016). Farmers, for example, may survive dry seasons by complementing rain-fed agriculture with dry season recessional farming in wetlands (i.e. when crops are sown in the moist soil as water recedes). In addition, wetlands provide the opportunity for diversification into crops that cannot be grown in the surrounding drylands (Scoones 1991). For transhumant pastoralists, who use particular wetlands only during a limited period of the year, wetlands are vital for the survival of their herds. Without access to wetlands, especially during extreme dry seasons when fodder is unavailable, their pastoral livelihoods may even collapse (see Haller 2020). Thus, wetlands not only facilitate the use of the surrounding drylands (Scoones 1991; Adams 1993; Brouwer 2014), but they also give the opportunity to buffer (climatic) risks through diversification and to foster resilient livelihoods, as they provide crucial resources when farming is otherwise impossible and pastoralism is under pressure.

In the drylands, access to the common-pool resources of wetlands has historically been regulated by rules that coordinate the different uses of different

users and user groups (Kouassigan 1966; Mizzau 1988; Lavigne Delville 1998; Pase 2011). Although these institutions mostly take the form of a common-property regime, wetland resources may sometimes be open to all (open access) or be held as private property. For example, in floodplains, fisheries and wildlife may be subject to an open-access regime during periods of high flood (because they are spread widely), a common-property regime at the beginning of the dry season (when water retreats and fish and wildlife are found in and around standing ponds), and a private property regime in dry times when families exclude others from use (Haller 2010b). Control over access and use typically lies with the 'first-comers', who enforce the locally developed rules and regulations and resolve conflicts (Haller 2010b, 2016). Access is thus not equal, as first-comers take precedence, but they also often grant those in need reciprocal access and coordinate the use of other groups (e.g. seasonal users, 'late-comers'), when protocols for asking permission are followed (Haller 2010b; 2016).

Large-scale wetland appropriations

The expansion of large-scale irrigated agriculture in the Sahel

Sahel wetlands have a long history of being targeted for large-scale irrigation projects. These projects, initially state-run and donor-supported and later under private investment (Kuper 2011; Bertoncin and Pase 2017), targeted the riverbanks and floodplains of major rivers, or major lakes and interior deltas. Large irrigation projects implemented during the colonial period include the Gezira in Sudan (Gaitskell 1959) and the Office du Niger in Mali, primarily for the production of cotton and rice (Morabito 1977, 1995). Under the creed of agricultural modernization, they involved huge infrastructures such as massive pumping systems, large dams, and hundreds of kilometres of channels; promoted mechanization and monocultures; and employed thousands of people. This trend continued after independence with a new wave of mega-irrigation projects, such as the Semry in Cameroon, and the Managil extension of the Gezira and the Rahad scheme in Sudan. If at first, these irrigation schemes seemed successful, they soon became marred by managerial and financial problems (often only a few years after the start of cultivation). In combination with fierce international competition (particularly cheap rice from Asia) and declining agricultural commodity prices, the strict work discipline imposed on project beneficiaries or 'allottees' (often consisting of both local and immigrating farmers), and the introduction of the structural adjustment programmes that reduced public funding in agriculture, they slowly collapsed. In some projects, production stopped completely; in others, large areas that had been prepared for irrigation were abandoned; and in yet others, operations continued but with considerable difficulties.

One wetland area intensively targeted by mega-irrigation projects has been Lake Chad, a very large but shallow lake located at the boundary intersection of the countries Niger, Chad, Nigeria, and Cameroon. One of the most significant projects implemented along the shores of the lake is the South Chad

Irrigation Project (SCIP) in Nigeria (Bertoncin and Pase 2012, 2017). It was part of a larger programme in the 1970s that sought to develop irrigation agriculture in the north-eastern region of the country to, on the one hand, counter a growing trend of rural-to-urban migration by offering migrants an alternative as project allottees, and on the other hand, to consolidate the local economy in what was considered a strategic (because peripheral) area along the international border. SCIP targeted a floodplain along two tributaries of the lake, comprising an area of about 9,300 ha, which was used intensively for the cultivation of sorghum through recessional agriculture, and millet, onions, okra, and peanuts through rain-fed agriculture, as well as for grazing and fishing, by 18 villages with a total population of about 10,000. In a very short period of time, channels and pumping stations were constructed for the mechanized production of wheat, rice, and cotton, as well as offices, warehouses, and 'modern' villages for the allottees. More than 3,000 workers were employed.

After a peak harvest in 1983–1984, nothing was harvested the following year and the project stopped. An important reason for this failure was the lack of water due to a receding lake in the context of the 1980s' droughts. When the water returned in 1988, the structures, having been inactive for so long, no longer worked effectively and there was no money available to repair them. Nigeria had been thrown into an economic crisis, following a drastic reduction of petroleum income, and the government had ceased to fund agricultural modernization. In the following years, the pumps were reactivated from time to time to irrigate ever-decreasing areas of land, and many former allottees moved on to other places. Some of the farmers that stayed, however, gradually re-appropriated parts of the project for productive use. Inside the project area, they used improvised pumps to irrigate a few hundred hectares, and in the lower zones where rainwater accumulates or inside the channels of the project, they returned to cultivating sorghum. Outside the project area, but along the intake channel, which draws water from the lake and which started working again after the droughts, farmers installed small pumps to irrigate land. In the surrounding floodplain, they have resumed recessional agriculture.

Although significantly transformed by irrigation infrastructure, the (re-)claiming of wetland areas by local farmers and immigrant allottees from failed mega-projects has also been observed in Cameroon's Semry II project (Bertoncin et al. 2015). In Sudan's Gezira scheme, one of the largest irrigation projects in Africa, the Sudan state handed over the management of the Gezira scheme to the allottees and recognized their autonomy and land rights—although the state still manages the dams that feed the Gezira and therefore continues to control the availability of water for cultivation (Bertoncin et al. 2019).

Large-scale irrigation in the Sahel received a new impetus in the context of the 2008 global land rush by investors, following the abrupt rise of agricultural commodity prices. Host governments in Africa welcomed these investments, seeing in them a new opportunity to realize old ambitions of agricultural modernization (Woodhouse 2012). Different from the 'solid and heavy' projects characteristic of the earlier mega-irrigation schemes of the colonial and postcolonial period,

domestic and foreign investors set up 'light and mobile' hydro-agriculture projects that were medium to large scale. They tended to avoid large costs for infrastructures (favouring light irrigation systems instead) and employed a very small number of personnel, which was possible thanks to the push towards complete mechanization. Most investors and entrepreneurs avoided the lands once developed by the earlier mega-projects, re-occupied as they often were by local farmers, but also because of the bad state of the infrastructure and the complicated bureaucracy to acquire them legally.[5] As a result, they targeted the wetland areas next to or near the old mega-projects or totally new areas far from rivers, targeting groundwater for large, mechanized irrigation agriculture and creating, in the latter case, new, artificial, and extremely fragile wetlands in the middle of the desert.

A case in point is the 'green circles in the desert' along the River Nile in Sudan, named after their central pivot technology, which creates round irrigated fields (Bertoncin et al. 2019) (Figure 4.1). While the Gezira and other irrigation schemes are located south of Khartoum between the White and the Blue Nile, to the north of the capital city new irrigation projects (ranging from 2,000 to 100,000 ha in area) started to appear in the early 2000s. This trend accelerated following the food price spike of 2007–2008 and received a new boost in 2013 with the passing of investor-friendly legislation. These projects, driven by foreign investors, mainly produce fodder (alfalfa) for the Gulf countries, who are outsourcing their agricultural production owing to water shortage at home. The potential for expansion of alfalfa cultivation in Sudan is enormous, as the demand for fodder in countries such as Saudi Arabia and the United Arab Emirates is ever-growing, and

Figure 4.1 Irrigated area with central pivot system in River Nile State, Sudan, for the production of fodder destined for the markets of Saudi Arabia (2015). Photo taken by Marina Bertoncin.

therefore these irrigation enclaves are likely to continue multiplying northwards from Khartoum and outwards from the River Nile. Even though these projects are not located immediately adjacent to the river—sometimes they are even tens of kilometres away into the desert—and may also make use of groundwater, they still often have to acquire the strip of land that connects their project to the river to access water from the river through underground pipes or canals. The lands along the river are usually densely populated and intensively used for horticulture and cultivation of fruit trees, while the more inland areas are used for nomadic and semi-nomadic grazing. These projects, with their fences and sometimes police checks, are clearly separating irrigated areas from the surrounding drylands and creating new agricultural spaces completely controlled by investors, to the exclusion of former users.

Shifting conservation approaches in the Waza National Park in Cameroon

With the Ramsar Convention in 1971,[6] an international treaty for wetland protection, the issue of wetlands in drylands was placed squarely on the conservation agenda. Initially valued as habitats for migratory water birds and later for their 'ecosystem services' (Tooth et al. 2015), protected wetlands in Africa have undergone various institutional changes in line with changing international conservation priorities and discourses. 'Fortress conservation', a conservation model that rests on the belief that a strict separation between local populations and conservation areas is best for biodiversity protection, excluded all consumptive use of protected areas and was for a long time the dominant conservation approach in dryland areas and elsewhere (Neumann 1998; Brockington 2002). Following criticism of this approach, a shift occurred towards participatory and more community-inclusive conservation in the 1970s and 1980s (Adams and Hulme 2001; Galvin and Haller 2008; Bollig and Lesorogol 2016). Conservation approaches then took two different trajectories. On the one hand, there is a so-called back to the barriers tendency, advocating for stricter preservationist measures (Wilshusen et al. 2002; Hutton et al. 2005). One of the most significant examples of this new trend is the 2014–2019 banning of trophy hunting in Botswana (including areas around the Okavango Delta and the Chobe floodplain), which represented one way in which local people could benefit from wildlife conservation, as community trusts were entitled to a percentage of the trophy-hunting revenues (LaRocco 2016; Mbaiwa 2018; Blaikie 2019). On the other hand, starting in the early 2000s, there was a move away from 'biodiversity hotspots' and charismatic megafauna to conservation strategies accommodating climate change scenarios (Kelly 2013). The case we present below suggests that as a result of this latter development, conservation funding for wetlands in dryland areas started to dry up as international environmental organizations shifted their attention towards more humid and forested ecosystems.

The Logone floodplain is located in the southernmost tip of the Sahel and forms part of the Lake Chad basin, covering over a million hectares of land in

Figure 4.2 Channels for catching fish when the flood recedes from the Logone floodplain, Far North Region, Cameroon (2021). Photo taken by Aboukar Mahamat.

Chad and Cameroon. It is considered one of the most productive inland fisheries of Sub-Saharan Africa (Figure 4.2). The floodplain also supports a rich variety of wildlife and birds, including migratory birds from Europe. It is for this high biodiversity that the Waza National Park was created in Cameroon, which is partly situated in the Logone floodplain and covers an area of 170,000 ha (Fokou and Haller 2008). The park was initially established as a French colonial hunting area in 1934 to gain control over the highly mobile people of northern Cameroon (Kelly 2014), and it was declared a UNESCO Man and Biosphere Reserve in 1979 (Fokou and Haller 2008). The strict 'fortress' approach adopted by the park affected several specialized user groups that had long profited from the rich diversity of natural resources in the area. These included sedentary Kotoko fishermen and Musgum agro-pastoral-fishermen, and the pastoral Choa Arabs and Fulbe coming in from the north (including from Nigeria and Chad) during the dry seasons in search of lush pastures and watering sources (Fokou and Haller 2008). As the first settlers in the Logone floodplain, the Kotoko claimed common ownership of the land and, as such, regulated access to fishing and pastoral resources. Fisheries were managed as the common property of the village. The Fulbe and Choa Arabs had to request permission to access pastures and they paid taxes and tributes, while the Musgum had to follow different rules for different seasons and also paid taxes. Local Kotoko chiefs decided over and coordinated the activities of the various users regarding timing, intensity, and seasonal conditions. This flexible coordination of resource use during and between seasons was important in limiting conflicts between the different user groups (Haller 2020).

Waza National Park was known for its strict and violent enforcement of fortress conservation, which banned all local resource use inside the park but kept the area open to tourists (Kelly 2014). While historical users lost agricultural fields and legal access to pastures, fisheries, and hunting grounds, and those living within the perimeter of the park were evicted without compensation, they never really stopped using the resources of the park, going there overnight or during the flood season when it was more difficult for the guards to patrol the park boundaries (Fokou and Haller 2008). Continued access to the park was important to supplement their food supplies, especially during the dry seasons when resources were scarce elsewhere but still abundant in the park. Also, as Kelly (2014) explains, some people were able to maintain limited access to the park through their relationships and negotiations with park guards, gaining advantage over people who lived further afield and were thus unable to foster relationships with guards. It was these 'outsiders' that were violently excluded from the park, suffering from the brutal and sometimes deadly punishments by guards for trespassing into the park (Kelly 2014).

In the 1970s and 1980s, severe droughts and the construction of a dam upstream of the Logone River for a large-scale rice irrigation project (Semry II) had a major impact on the Logone wetland (Bertoncin and Pase 2012). Flooding area was reduced by 30% (IUCN 2013 in Fokou and Haller 2008), which severely decreased the availability of fish, pastures, and wildlife in the floodplain. Poaching increased in the park, and resources in the larger floodplain became overexploited. Eventually, about 40% of the population that depended on the wetlands' natural resources left the area (Scholte 2003 in Fokou and Haller 2008). In the mid-1980s, as Cameroon entered a prolonged economic crisis and government funding for the park was cut, park infrastructure slowly deteriorated and the pay of park managers and guards was severely reduced. In response to declining government control of the Waza National Park (Kelly 2014), but also to mitigate the changes caused by the dam, international actors stepped in and in 1992 an IUCN-led co-management project was initiated that integrated conservation and development through a 'return of the water' policy (Fokou and Haller 2008). The project targeted the buffer zones around the Waza National Park and was in line with a more participatory approach to conservation adopted by the park authorities (following new international conservation discourse), which aimed at involving local communities in the decision-making process of a new management plan. The plan included new rules for fishing and allowed the consumptive use of some resources (wood, resin, thatch), but hunting, agriculture, and grazing continued to be forbidden. Although the IUCN re-flooding programme improved the ecological condition of the larger wetland, the implementation of the management plan was very slow, and while some use of resources in the park was now officially permitted, for local communities the losses (crops and livestock, due to lions and elephants) continued to be far greater than the gains from conservation (compensations, tourism, and trophy-hunting revenues).

As climate change mitigation became the new international conservation focus in the early 2000s, donors and international NGOs involved in the IUCN

project shifted their attention towards Cameroon's southern—more forested—areas (Kelly 2014). The IUCN project was phased out, and by 2008 the Waza National Park was practically abandoned. Without national or international control over resource use in the Waza National Park, 'outsiders' (i.e. those formerly excluded from the park) began flooding the area and included

> agriculturalists and pastoralists leaving places like Chad and Niger due to drought, political refugees from surrounding nations, decommissioned soldiers from places like Chad, militants from Nigeria, and the unemployed (Cameroonian and foreign-nationals alike) created by the region's economic crisis.
>
> (Kelly 2014: 739)[7]

While some of these new actors were drawn by the newly accessible natural resources of the park, other more violent actors (thieves, kidnappers) used this now unprotected and unsupervised area to hide. As a result, local resource users who had enjoyed limited access to the park (illegally or through arrangements with guards) not only saw their food security being threatened by the uncontrolled use of resources by outsiders, but—because of the presence of violent actors in the park and increasing insecurity—were increasingly unwilling to enter the park at all.

Mining, resettlement, and compensation in Mozambique

Africa has experienced a boom in mining and extraction since about 2000 (Chuhan-Pole et al. 2017). Growing interest by investors and international companies in the region's abundant natural resources, ranging from oil and natural gas to all sorts of metals and minerals, has led to increased resource exploration, new deposit discoveries, and increasing mine openings. Although large-scale resource extraction in Africa has a longer history associated with imperialism and colonialism, what makes this boom new is that it is being facilitated by host governments through the introduction of new, investor-friendly policies in the name of socioeconomic development (Jacka 2018). Reforms in the mining sector, often under pressure from structural adjustment programmes, have pushed commodity prices up and have spurred a global wave of international mining companies targeting resource-rich countries in Africa and elsewhere (Jacka 2018). Wetlands in drylands are increasingly being affected by this corporate rush in search of mineral wealth. Often this happens indirectly, such as when extractive activities elsewhere have a downstream impact on wetland areas.[8] But sometimes, the wetland itself holds resource wealth and is the target of mining operations. We present such a case from Mozambique, a country whose economic model of development has taken an 'extractive turn' (Wiegink 2018) following the discovery of enormous reserves of coal, natural gas, heavy mineral sands, graphite, rubies, and gold since 2003 (EITI 2008).

Kenmare Resources PLC ('Kenmare') is an Irish company and the first one to exploit Mozambique's large deposits of heavy mineral sands. The company has

a relatively good reputation in Mozambique.[9] Heavy sands are primarily found along the coast and contain zircon and titanium minerals, which are important for the construction sector and are used in paints and coatings, PVC piping, decorative laminates, and ceramic tiling. Kenmare began constructing their first mine in 2004 on the coast of Nampula Province in northern Mozambique and first achieved production in 2007. About a decade later, as the mine's ore concentrates were diminishing, it redirected its attention to a new deposit further south, in a heavily utilized wetland area along the coastline but separated from the sea by dunes, and acquired a land-use right (called DUAT) of 3,263 ha, of which it planned to mine 1,267 ha. This inland wetland area extends over a lower-lying stretch of land of no more than 2-km wide, containing a large lake and a river running in parallel to the coastline, which is fed by numerous smaller rivers coming from the higher-lying land and forming a floodplain and swampland in the northern part of the area.[10] Overlooking this lowland are five villages of shifting cultivators and fishermen who make intensive use of the wetland area. Many villagers (approx. 40%; see CES 2018a) have agricultural fields in the wetland, where they grow crops such as cassava, beans, peas, okra, groundnuts, and pumpkin, as well as crop trees such as cashew, banana, and mango trees. Many families also grow water-hungry crops such as rice and sugarcane, and some have excavated vegetable gardens in the swampy areas. Maritime fishing is an important livelihood activity, and crisscrossing the wetland are a number of pathways to reach the sea. When coastal fishing is not possible (e.g. due to weather conditions), fishing takes place in the lake and rivers, which are also used for bathing and washing. The area is a source of firewood, building materials (wood, grasses, reeds, sand, clay), and wood for making furniture and boats, and a place for gathering fruits and plants for consumption and for medicinal use. There are some boreholes, and several cemeteries, individual graves, and sacred sites for ceremonies and prayers. Although most families live in the villages, a few live in the wetland area on a permanent basis. Along the coastline, there are a number of temporary shelters used by people who live further inland on an ad-hoc basis throughout the year for fishing.

The mining process would involve a drastic transformation of the landscape and included stripping the land of its vegetation, removing the topsoil, diverting half of the river, and dredging the swampy areas in order to excavate an artificial pond to extract the zircon and titanium from the sand. But before these activities could begin, people living in the wetland area and using its resources would need to move and stop using the area.

Government regulations in Mozambique require companies to resettle and compensate anyone who lives on or uses the targeted land. A guiding principle in resettlement practice is to ensure that no affected person or community is worse off after resettlement. In early 2017, Kenmare hired a specialist consultancy company to develop a Resettlement Action Plan (RAP) in consultation with government authorities and affected community members. Numerous meetings were held in this process, including the four legally required public consultations with the affected villages, and numerous studies were carried out to identify potential

impacts and losses. An important task of the consultancy company was to take inventory of all 'assets' in the wetland area that would be affected by the new mine and to determine whether and how to resettle or compensate its owners. For this, Mozambican legislation on land and resettlement was followed closely,[11] the most determinative principle being that as the land belongs to the state, it cannot be bought or sold and hence it cannot be compensated for. Instead, what is compensated for is the *use* of land, or more precisely what is *on* the land (i.e. the assets: houses, crops, etc.), and lost agricultural fields should be replaced with new agricultural fields. Thus, while land ownership is not recognized (even though local users consider themselves the owners of the land), ownership of assets is. The consultancy company identified 14 houses that would need to be physically resettled[12] and 4,224 agricultural fields for which new land of the same size would need to be found. Compensation would be paid for lost crops and crop trees and for secondary structures (e.g. outside kitchens, crop storages, livestock enclosures). However, the loss of communal resources would not be compensated. Instead, the consultants advised the company to reserve as much as possible of the lake, cemeteries, and sacred sites (those cemeteries and graves that could not be preserved would need to be relocated) and to create access routes to these sites as well as to the rivers and coastline for fishing. It was also proposed to create access corridors for harvesting other common-pool resources such as firewood, grasses, medicinal plants, and fruits. The RAP also detailed special support to vulnerable individuals, additional cash payments to resettled farmers (e.g. for the effort of preparing the new field), financial assistance for registering their new landholdings, and agricultural extension services for two agricultural seasons. Finally, all five villages would be integrated as CSR beneficiaries of the company-funded NGO.

Processes of change

All three cases of wetland appropriation presented above have brought (or were about to bring) drastic changes to the lives of the local populations in terms of resource use, institutions, and livelihoods. We distil and discuss three processes of change (rigidization, institutional change, loss of resilience) apparent in all cases to a greater or lesser extent, and we illustrate each by digging deeper into one of the cases.

Rigidization

Large-scale irrigation projects brought rigidity to wetlands where flexibility had previously reigned (Bertoncin and Pase 2017). As we have seen, dryland's irregular seasonal and inter-annual rainfall and the strong variability in river water levels affect the resource dynamics in wetland areas. Based on knowledge developed over time, local populations have adapted to these dynamics with flexible and mobile practices and institutions that accommodate multiple resource uses and users at different times and seasons. Mega-irrigation projects dismissed this flexible resource use, introduced rigidity that 'intercepts and blocks space, relationships,

knowledge and organizations' (Bertoncin and Pase 2017: 245), and created boundaries of exclusion. The SCIP in north-eastern Nigeria brought modern technology that radically modified the landscape into geometrically partitioned spaces, controlling what entered and left (water, people, produce), when, and how much. It also introduced new institutions and power hierarchies imposing an iron discipline, techno-scientific expertise that comes from the global North, and agro-industrial production practices and procedures (e.g. monocultures) directed from above through scheduled timetables. In the process, it marginalized local institutions and authorities; ignored local knowledge of the land and the rhythm of the water; and kept the natural floods, traditional crops, and the herds outside the project perimeter. SCIP's rigidity was unable to deal with the Sahel's climate variability, which eventually added to its failure. Even though its hydrographic interventions had managed to master the wetland's seasonal pulse, it was unprepared for its inter-annual and longer-term pulsations. Lake Chad is capricious, and its surface changes rapidly depending on how much water comes in through its tributaries. There are in fact three Lake Chads, depending on the water level; the Small, the Medium, and the Great Chad. The SCIP was designed for the conditions that existed in the 1950s and 1960s (i.e. those of Medium Chad). However, with the 1970s and 1980s droughts, the lake rapidly switched to Small Chad and the project was left without water for agricultural irrigation. SCIP's rigid water control structures turned out to be inappropriate for a climate characterized by the erratic rainfall of the Sahel and the unpredictability of river floods. We also saw that farmers re-appropriated the wetland area. In doing so, they challenged the rigidity of the project by 'planting where it was not expected, accessing water where it was not allowed, [and] growing what was not permitted' (Bertoncin and Pase 2017: 251). In effect, they reintroduced flexibility and common use by repurposing project infrastructures, coming up with innovative solutions, and taking advantage of project expertise. This was thus not a 'going back to the old ways' but a creative and unexpected integration of modern knowledge and traditional expertise. This hybrid form of resource use combined the flexibility that seasonal rainfall demands (recession agriculture after the rainy season) with new technologies and project infrastructure—namely, using small motor pumps along the intake channel to draw the only water available in the area during the dry season (Bertoncin et al. 2015).

Institutional change

While the failure and defunding of Lake Chad's irrigation project led to re-appropriation and re-use, in the case of the Waza National Park in Cameroon it led to insecurity and open access. At the heart of this unfolding lies the violent nature of the institutional transformations that this portion of the Logone wetland underwent as it followed the tune of international conservation discourse. In the course of these developments, the very institutions that for a long time had quite effectively regulated the common use of resources by different groups were weakened and undermined (Fokou and Haller 2008). When the Waza National

Park was created, the designated conservation area became state property, and state rules now dictated the terms of access. Institutions enforcing fortress conservation were introduced that criminalized local resource use—particularly livestock grazing, which was seen to compete with herbivores during the dry season (cattle found in the park were shot or confiscated). However, as we saw, even though local institutions were replaced and local chiefs lost resource control, this new institutional framework *did* allow for some local resource uses—however limited—in the park during different periods. Between 1930 and the late 1990s, park authorities tolerated some access by local users, while violently excluding those living further away from the park (Kelly 2014).[13] In the more participatory era of the park, in the 1990s and early 2000s, when international actors stepped in to fill declining state funding, a new management plan legalized some resource uses, while it continued to prohibit others. What was declared participatory conservation was thus still very much a top-down approach (Fokou and Haller 2008). However, when these international actors also withdrew funding and left the park, local chiefs whose villages had previously been within park boundaries lacked the authority to retake control and re-introduce their institutions of use and access (Kelly 2014). Nomadic pastoralists, for example, coming from outside Cameroon to graze their animals in the Logone floodplain, no longer recognized Kotoko institutions, because they had been paying taxes to the state; and once paid, they were told by state authorities that they were free to go wherever they wanted, an argument they used to ignore local rules of access and use (Fokou and Haller 2008; Haller 2020). Thus, more than 70 years of enforcing biodiversity conservation had effectively erased local institutions, and as conservation actors left, an institutional vacuum was created (Kelly 2014). By 2008, the park became a *de facto* open-access space characterized by uncontrolled overuse (Kelly 2014). It also became a hideout for violent actors, deterring local resource users from entering the park (Kelly 2014). With this, long-term users finally lost the little access they still had. As access to the relatively abundant resources in the park had been important for them in times of food shortage, it also critically threatened their food security—a major problem in an environment where resources fluctuate drastically, both seasonally and annually (Haller 2020).

Loss of resilience

While the Sahel and the Cameroon cases concern appropriations that took place a long time ago (allowing us to assess long-term impacts and changes), the Mozambique case covers a recent appropriation. Also, because the last field visit was undertaken before the resettlement took place and the new mine was established (in 2020), we cannot comment on the actual impacts of this large-scale wetland appropriation. We can, however, apply a 'wetlands in drylands' lens to analyse the pre-resettlement public consultations and the RAP and show how this appropriation will likely undermine the resilience of local livelihoods, despite Kenmare's best intentions and intensive engagement with stakeholders to ensure that livelihoods are maintained or improved after resettlement.

In developing the RAP, Kenmare made sure to adhere to Mozambican regulations. In doing so, however, it also incorporated some biases inherent in national legislation that account for a number of 'invisible losses' (Witter and Satterfield 2014), some of which reduce the capacity of local resource users to cope in dryland environments. One bias is the snapshot understanding of agricultural land use—that is, considering only land that is under cultivation at a certain point in time, with the result that fallow land is not replaced or compensated for, even though it is an integral part of the agricultural system of shifting cultivators. The standard answer during public consultations to questions by villagers about fallow land was: 'The land belongs to the government, and fallow land is not compensated'. Another bias is the narrow understanding of 'asset' and property, with the result that only those assets with clearly identifiable (individual) owners were considered for compensation. The loss of common-pool assets or resources (e.g. medicinal plants, woodlots) was not slated for compensation. Yet access and use of some common-pool resources are key to people's year-round food security. Wild fruits and roots, for example, are mostly gathered at the end of the rainy season and during the dry season to complement cultivated food supplies. Reduced access to these resources thus threatens people's resilience in times of food scarcity.

These two examples illustrate how the RAP took no notice of the seasonal and inter-annual use of land and natural resources in dryland livelihoods, uses which are crucial when the main economic activity is rain-fed agriculture. On top of this, it overlooked how the use of certain resources forms part of a wider system of natural-resource use—meaning that when access is reduced to one resource, the whole system is put under pressure if no adequate compensation is provided. Although some resources (e.g. wood) can be found both in the lower-lying wetland area and in the drier upland, a number of key resources (fish, an important source of protein for the local diet) are particularly abundant in the wetland, illustrating the 'niche' (Scoones 1991) function of wetland use in dryland areas. This nuance—that is, the relationship between wet lowland and dry highland and its socioeconomic significance—was missing in the studies, with the wetland impact assessment (CES 2018b) focusing exclusively on ecological functions, while the study on land and natural resource use (CES 2018c) insufficiently emphasized the wetland particularity of resource use. The most problematic consequence of this oversight is that agricultural fields in the wetland were replaced with agricultural fields in the dryland. In this process, resettled people lost wetland-specific agricultural resources, such as fertile land and water for irrigation, and the opportunity to grow water-hungry crops (rice, sugarcane, bananas), thus losing an important diversification option and the ability to spread food security risks. Income from bananas in particular is key during poverty cycles and hunger months.

In summary, by failing to consider the significance of wetlands in drylands as 'pools of resilience' (Haller 2016) for local livelihoods, people's resource needs during times of stress (e.g. dry seasons, droughts, food scarcity) were not taken into consideration in the resettlement planning process.

Conclusion

Large-scale appropriations of wetlands in drylands by powerful actors (states, companies, international environmental organizations) restrict access to natural resources that are vital to the livelihoods and food security of dryland populations. Sometimes negotiated or stealthy access is still possible (albeit at the risk of violent retribution, as in Cameroon), but in other cases appropriations involve such drastic changes to the landscape (mining in Mozambique) that there are simply no resources left to access, even illegally. When large-scale investments or interventions in wetlands fail or end and their proponents leave, either wetland resources can be re-appropriated by the local population (irrigation projects in the Sahel), or wetlands can become ungoverned spaces such that those who had retained limited access now lose all access, while other more violent actors (re-)gain (new) access (Cameroon).

Reduced or lost access to wetlands has impacts in the wider region, as former users move elsewhere or overuse nearby resources to compensate for lost resources, potentially triggering conflict and competition over resources. Further work could better tease out how sudden changes due to large-scale appropriations interact with the well-documented piecemeal and gradual changes of rural differentiation, market integration, population growth, and so on that underlie many of the resource use conflicts and competition in and around wetlands in drylands.

Large-scale appropriations set processes of change in motion that have important implications for wetlands and their long-time users. New actors often introduce rigid ways of using and managing resources that are out of sync with the climatic variability of drylands and the pulsations of wetlands, supplanting the flexible resource use practices of dryland inhabitants. Along with changes in resource use and access, institutions for managing and governing resource use in wetlands also change, as new institutions undermine and sometimes erase local rules of access, coordination, and conflict resolution. Last but not least, dryland users stand to lose resilience as wetland appropriation takes away common-pool resources that are vital for surviving the variable climatic and low rainfall conditions of drylands. Overall, we may conclude that large-scale appropriations of wetlands in drylands displace and dispossess historical dryland users from a key livelihood resource and thus further marginalize a population that is already among the most marginalized and food-insecure in the world.

Notes

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2 See also, The Wetlands in Drylands (WiDs) Research Network: http://wetlandsindrylands.net [Accessed 2 July 2021].

3 Hydro-periods are the number of days per year that an area of land is wet.
4 Resilience is broadly understood here as the capacity to recover from times of emergency (e.g. droughts, political insecurity, economic crises).
5 In a few places, as along the Blue Nile River (Bertoncin et al. 2021), new investments *do* take place in former irrigation schemes.
6 Named after the Iranian city where the convention took place.
7 For nomadic pastoralists, whose access to dry season grazing elsewhere in the floodplain had been gradually reduced over the decades (owing to agricultural expansion, more fishing canals, conflicts, large-scale irrigation projects), going to the park may have been the only option available (Haller 2020).
8 As is the case of oil exploration in Namibia, which is impacting the Okavango Delta in Botswana: https://www.nationalgeographic.com/animals/article/oil-company-reconafrica-accused-of-ignoring-communities-concerns [Accessed 9 June 2021].
9 In a study on social impacts of heavy sands mining in Mozambique, it compared favourably with the other company (Chichava et al. 2019), and in 2020 it was proclaimed the most transparent company in the extractives sector in Mozambique by watchdog organization *Centro de Integridade Pública* (CIP).
10 The wetland study (CES 2018b) follows an ecological and narrower definition of wetland, focusing exclusively on the marshes, peatlands, and water bodies in this lower-lying area, while our understanding of wetland is broader, taking into account its social and livelihood functions, and includes the adjacent areas, thus covering the general lower-lying area. The other study we draw on is the soil, land, and natural resource use study (CES 2018c), which focuses on all the natural resources that the affected villages rely on, both in the higher-lying and the lower-lying lands.
11 Performance Standard 5 of the International Finance Corporation (IFC) was also followed, which defines best practices in terms of resettlement.
12 Eventually only eight required resettlement.
13 Pastoralists, also 'local' users, appear to have been tolerated less than sedentary users, whom interacted with guards stationed in their villages on a daily basis and hence were able to forge stronger relationships (Kelly 2013).

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5 Large-scale agricultural investments in drylands

Facing some blind spots in the grabbing debate

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Introduction

Large-scale agricultural investments (LSAIs) surged following the 2008 food and financial crises and increased climate change concerns. Driven by alarming news of price spikes of food and biofuel crops, a plethora of actors began investing in farmland in an attempt to spread financial risks and safeguard access to agricultural commodities. The acceleration of land investments soon caught the attention of scholars and civil society organizations (Cotula et al. 2009; Borras and Franco 2012; Woodhouse 2012; Schoneveld 2017), and the term 'land grabbing' was introduced to conceptualize this phenomenon, even though a number of investors acquiring land complied with host countries' legal frameworks. Consequently, some studies on 'land grabs' used the term without accurate empirical insights, assuming that land was acquired illegally. Another series of studies used the term to denote perceptions of injustice (even if formal laws were not violated), as land was often allocated to external investors at the expense of local populations. This especially happened in areas of the global South and global East, where historical land users often lack state-recognized titles yet consider the land and its resources to be theirs (Alden Wily 2013).

At the (initial) height of academic and media attention to large-scale land acquisitions, 'land grabs' were primarily understood and associated with foreign investors' hunger for farmland and natural resources, and the thus observed and documented 'land rush' triggered a 'literature rush' (Oya 2013). As researchers felt the need to call for direct attention and action, some of the early and quickly commissioned reports and publications were unavoidably marred by untested assumptions and inherent biases (Oya 2013). The urgency to draw attention to 'land grabbing' may also have motivated civil society organizations and activist scholars to somewhat exaggerate 'land grabs'. After all, 'big' numbers help to raise attention. More rigorous and sometimes nuanced analyses and discussions followed shortly after the earliest series of reports. Various characteristics of later work exemplify this evolution.

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First, the geographic scope broadened. Whereas scholars and international media initially focused on Africa, Southeast Asia, and Latin America, scholars working elsewhere in the world soon joined the debate and raised attention to the fact that similar phenomena also took place in their research locales, such as in Eurasia (Visser and Spoor 2011; Petrick et al. 2013).

Second, studies started to highlight the diversity of 'grabbers'. Thus, a more nuanced approach to understanding the characteristics of actors acquiring land appeared. While the Chinese and Gulf states were initially foregrounded as primary actors driving the land rush—China was particularly put under a global magnifying glass (Hofman and Ho 2012; Bräutigam and Zhang 2013; Bräutigam 2015)—over time other investors were recognized, including European pension funds and domestic elites (Fairbairn 2013; Keene et al. 2015). The varying roles of host states in land acquisitions also gained more attention (Bertoncin et al. 2019). These studies highlighted that, on the one hand, the state can be the financer (or one of the financers), thus an investor in large-scale agricultural projects and on the other hand, the state can act as an initiator by attracting investors, or it can act as a facilitator by, for instance, amending state law, allocating land, improving infrastructure, and/or mediating between land users and investors. Of course, these respective roles are context-specific, and the state can wear diverse hats over the course of time. States, elites, and investors are, in turn, internally heterogeneous, with diverse sub-groups pursuing different interests and investment logics (for investor heterogeneity, see Abeygunawardane et al. 2022). In recent years, scholarly literature on LSAIs has also pointed to variations in states, elites, and investors' relationships. They may form alliances and team up or compete, as occurs when investors want land for purposes that conflict with state interests. Importantly, regardless of status, background, or role played, these actors typically perceive the targeted land as empty and underutilized. This understanding or framing goes back to colonial and earlier postcolonial times, when portraying land as 'wasteland' or 'abandoned' justified state appropriation of customarily owned and used land (Haller 2019; Haller et al. 2019). Today, it justifies the transfer of state land to investors (see also Baka 2013; Keene et al. 2015).

Third, following questions about the 'newness' of the global land rush (Edelman et al. 2013), concerted efforts were made to historicize the 'land grab' phenomenon by reference to colonial times and earlier waves of land acquisitions (Alden Wily 2013; Edelman and León 2013). And fourth, the 'land grab' literature came to encompass studies of a wider array of struggles over land going beyond only land acquisitions, which could be interpreted as 'control grabs' in various ways (Oliveira et al. 2021).

In this chapter, we build on and engage with this debate and provide a 'drylands' perspective. We identify a number of tenacious analytical blind spots in the literature that appear when thoroughly exploring some anomalies related to the maps, the labels, and the numbers that circulate in debates on LSAIs in the drylands. We argue that to illuminate these blind spots, more rigorous, longitudinal, and 'on-the-ground' studies are imperative (as also argued by, among others, Lu 2021). A drylands perspective is important, as LSAIs are increasingly targeting

dryland areas, especially the localities where water for irrigation is available—the so-called 'wetlands in drylands' (see Chapter 4, this volume), such as river banks, areas that are flooded annually or seasonally, and/or places where investors can draw on aquifers. After all, aridity means that water, rather than land, is the key resource. Yet wetlands in particular are also essential for dryland populations, whose often mobile livelihoods and complex tenure configurations are frequently overlooked in analyses of the impacts of LSAIs. Our focus is on historical and contemporary large-scale investments in agriculture in the drylands of Africa and Central Asia. In the Land Matrix dataset,[2] a large-scale land acquisition is defined in terms of surface area as an investment of 200 ha or more; the maps contained in Figures 5.1 and 5.2 follow this definition.[3]

The first blind spot concerns the variability of numbers reported on single land acquisitions, raising questions of reliability and accuracy. This appears a stubborn blind spot. It was already noted by other scholars (Edelman 2013; Oya 2013), but is still observable in the literature today, and relates to large-scale land investments in general (not only those oriented towards agriculture), including in the drylands.

The second blind spot emerges when comparing the maps in Figures 5.1 and 5.2. While the map of Africa shows many land acquisitions in dryland areas, the second map, that of Central Asia, appears almost blank, suggesting that only a few land acquisitions have taken place in the region. Yet, as we discuss below, similar struggles over land may exist in both regions—but when not labelled as 'land grabs' or raised publicly and observed so by outsiders, acquisitions may not receive international scholarly attention.

The third blind spot derives from the perception of land as an undivided space, which obscures the subtleties of what an LSAI may mean to (former) land and land-related resource users. First, the focus on land alone conceals the fact that LSAIs may involve the expropriation of a wide range of rights over land-related natural resources that are not easily captured under the 'land' category, particularly common-pool resources such as water, pastures, forests, fisheries, and wildlife/hunting grounds (Haller 2019). The term 'commons grabbing' has emerged in the literature to address this limitation (Haller et al. 2013; Dell'Angelo et al. 2017; Gerber and Haller 2021). In addition, the scholarly focus on the *local* impacts of 'land grabbing' misses out on the relevance of common-pool resources to distant and mobile groups that may use these resources seasonally and intermittently, such as pastoralists. The importance of common-pool resources and the rationale underlying mobility and intermittent use of natural resources are not always sufficiently understood or acknowledged.

The fourth blind spot emerges from the fact that quite a few LSAIs do not fully materialize or are not realized at all. However, instances of failure have rarely been studied, thus concealing the fact that some projects may be less mammoth than the initial figures suggested or even did not take place at all. By neglecting struggles and failures one may miss out on important dynamics and questions: What happens if previously acquired land is de-annexed when an investment fails or scales down? Does the land revert back to the local communities, or does the state take over? And what does this mean for local use and access to resources?

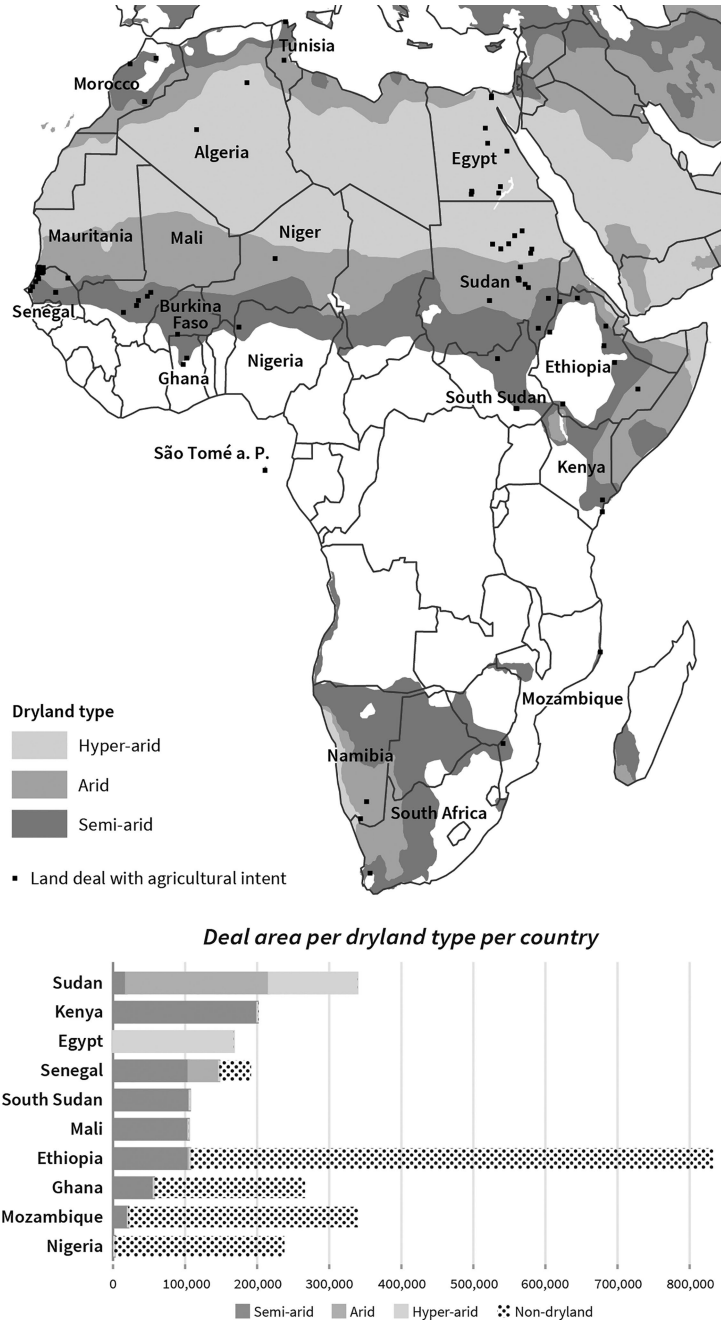

Figure 5.1 Land deals with agricultural intent in Africa (Land Matrix 2020; UNEP-WCMC 2007. Map composition and design by M. Abebe).

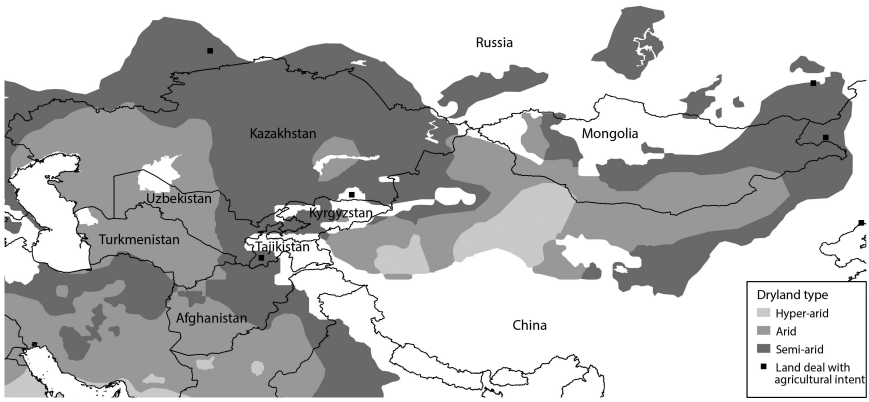

Figure 5.2 Land deals with agricultural intent in Central Asia (Land Matrix 2020; UNEP-WCMC 2007. Map composition and design by K. Hurni).

In the remainder of this chapter, we discuss these blind spots in more depth and illustrate them with concrete examples.

Lost in numbers

Single investments are often quantified in diverse ways, with regard to the extent of land (area) subject to investment. This confuses, and it raises questions: What do the figures actually represent and tell us? Do reported numbers refer to the land that *has been acquired*, or do they refer to the *intended* surface to be acquired but *not yet realized*? And, if realized: How much of the acquired land is actually brought under production, if any at all? Beyond those questions and, perhaps even more important: conflicting, varying numbers raise questions about reliability. Oya (2013) and Edelman (2013) problematized the reliability of data in reports that resulted from the rush to publish. Some of the early studies on LSAIs were published without 'fact checking' on the ground. A part of the studies or reports were cited with numbers being recycled, risking the further dissemination of numbers, which were then subsequently taken for granted (for a critique, see also Bräutigam 2015).

The case of a large-scale investment by a foreign actor in Mozambique illustrates the problem of varying figures. This investment has been subject to various reports on 'land grabbing' (Justiça Ambiental and UNAC 2011; The Oakland Institute 2011; FIAN 2012; Koordinierungsreis Mosambik 2016). It was initiated in 2005 and initially carried the name of Chikweti. In 2014, Chikweti merged with a company called Green Resources, acquiring the latter's name. An overview of the various studies that evaluated this investment sheds light on the fact that

the investment's land area has been reported in various ways, as demonstrated in Table 5.1. Not all reports included data on the categories we identified, and where they included similar categories the figures varied greatly.

The significant variety of numbers and the somehow vague descriptions attached to these numbers paint a confusing picture. Obviously, large figures tend to be foregrounded, and we also observe the recycling of figures, likely without fact-checking. However, reports may also include inconsistencies because researchers faced obstacles in obtaining accurate data. In this regard, we identify several reasons that might explain the discrepancies and contradictions in quantitative reporting of LSAIs. First, data on land investments tend to be controversial, and investors, state, and elite actors may conceal facts in order to prevent protests and international attention. For this reason, investment details may remain opaque, or figures are downplayed. Investors may also wish to hide corrupt agreements or seek to deflate figures to avoid paying high taxes and limit demands for compensation. In summary, data provided, if given at all, can be inaccurate. As stated in one of the studies included in Table 5.1: 'It is difficult to obtain precise information about the exact number and size of DUATs [land-use right titles], since authorities are reluctant to provide access to DUAT titles and the related documents' (FIAN 2012: 17). When the LSAI is a state project, we may observe other dynamics. Diverse state agencies, departments, or ministries may have and/or provide conflicting data. Moreover, agencies responsible for coordination and management may be reluctant to share land-related investment details—for instance, to hide operational inefficiencies and unmet project objectives from higher-level authorities. For all these diverse reasons, numbers may deliberately be manipulated (inflated or deflated) by the various actors involved. One remedy to better assess details about an investment's land area is to undertake research on the ground, perhaps supported by GPS tools or drone technologies, as well as by satellite images.

A deeper look at Table 5.1 highlights another important issue. A chronological order of the numbers, according to the studies' publishing date, shows that the studies were carried out at different times. The studies' timing may partly explain the diversity in numbers, reflecting the investment's trajectory over the course of the years. Indeed, the Chikweti/Green Resources investment changed its project plans several times: it extended its plantations at various times, faced damages due to fires, and underwent a merger that resulted in an increase in the surface area of the project (Kronenburg García et al. 2022). This trajectory exemplifies the fact that investments have lifetimes and evolve or develop over time in sometimes unintended directions. This complicates quantitative assessments, as each phase may involve a distinct category of land. In addition, land investments may involve specific categories of land, some of which emerge as investments mature. For example, when LSAIs are announced, given figures typically refer to the 'intended project area' or the 'potentially irrigated land'. Later on, numbers may come to refer to the land that is actually brought under cultivation, which is often smaller in size than the initially projected surface area. Thus, the variability of figures may also be due to the classification and types of land. For

Table 5.1 Studies reporting numbers (in ha) on the Chikweti/Green Resources investment

Study/report (in order of publication year)	*Intended*	*DUAT (land-use right title)*	*Preliminary DUAT*	*DUAT application in process*	*Planted*	*DUAT revoked*
Åkesson et al. (2009)	100,000 'area to be planted'				6,000	
Fundação Malonda (2010)	100,000 'project area'				13,000	
The Oakland Institute (2011)	140,000 'proposed'	28,970			32,000 'illegally occupied'	14,000
Justiça Ambiental and UNAC (2011)	140,000 'intended expansion'	31,000			32,000 'illegally occupied'	
FIAN (2012)	140,000 'to be managed'	51,000	35,430 (13,454 planted)	45,371	13,000/14,400; 32,000 'illegally occupied'	
IIED (2013)		32,217.77		12,040		
Blid (2014)		28,970		20,000		
Koordinierungsreis Mosambik (2016)	140,000 'concession area', of which 68,500 intended for tree plantations				32,000 'illegally planted'	
World Bank (2016)	258,000 'ambitioned'	63,040			14,250	

this reason, utmost care is required in the quantification of specific investments, and details on categories of land must be meticulously provided. In-depth research and fact checking that take the temporal dimension of projects into account are imperative to quantitatively report on LSAIs.

Lost in labels

The comparison between the two maps (Figures 5.1 and 5.2) points to another quandary that requires attention. While we observe many LSAIs in Africa, Figure 5.2 suggests that there are only a few in Central Asia. Is this correct, or are we overlooking something here? Has Africa really been 'the primary target of land deals' (Keene et al. 2015: 133)? What do maps reveal and what do they conceal?

Significantly, the term 'land grabbing' has not often been pitched in the academic literature on Central Asia, and the region has remained relatively underexplored in critical agrarian studies, one of the main fields of study that has looked into LSAIs. This is not to say that processes of land concentration and illegal seizing of landed wealth—that is, processes which could be categorized as 'land grabs'—have not taken place in the region. This brings us to the importance of attending to context-specific discursive frameworks. Grounded approaches are essential to identifying common processes that occur across the globe, and such processes are sometimes captured in distinct vernacular, or in non-English (and thus less read) publications. As Keene et al. (2015: 132) also noted, 'the language and definitions of drivers is overly structural unless accompanied by an in-depth understanding of the interests motivating different actors in specific land deals'.

In Central Asia, post-socialist agrarian change since the early 1990s generated opportunities for private wealth creation and concentration of land. International donors played an important role in this process, as various organizations pushed for privatization and demarcation of land plots (Petric 2015; Hofman and Visser 2021). While diversity exists in state ownership and land tenure, in most countries the state or ruling elites have sought to control the fragmentation of former state and collective farms' land in the last decades, in which the state, in some instances, granted rural wealth (fertile lands and pastureland) to capitalized, politically well-connected elites, while limiting access to land for the (less capitalized segments of the) rural population. Some of these elites held powerful positions in the Soviet state's administration in the late Soviet period; others emerged in the years afterwards. In Tajikistan, for instance, these include former bureaucrats and bankers, and former chairmen of collective and state farms, who had privileged access to 'grabbable' resources in the early 1990s. They were able to instrumentalize political and social capital to seize control over land and thereupon gradually accumulated wealth. The less privileged Soviet farm workers often had few opportunities to obtain (access to) land and farm assets. As a result, in many localities, post-socialist agrarian transformation triggered processes of land accumulation, and this has often been an incremental and concealed process (what we could call 'slow grabbing').

Two other more pronounced and related yet less recorded dynamics have taken place in Central Asia. First, besides the concentration of arable land ownership, urban elites have gradually accumulated control over pastureland over the past decades, in tandem with, and driven by, their investment in livestock. This trend has been observed by various scholars from and working in Central Asia but has not been recorded in academic literature (Hofman personal communication). Livestock is of high importance for rural livelihoods in most of Central Asia, as 'living capital' sold in times of crises or lifecycle events. Thus, the loss of or shrinking access to pastureland has significant implications. Second, instead of seizing land, elites in Central Asia have captured control over agricultural revenue streams. In Tajikistan, for instance, the Soviet-planned agricultural economy was replaced by a privately controlled planned economy. What thus happened was that—without dispossessing the rural population, but withholding autonomy over farm labour—elites who had co-opted the state could capture revenue streams, such as the revenues derived from cotton, while simultaneously showcasing a restructured countryside, with which they met international donors' demands to liberalize the rural economy (Hofman 2021; Hofman and Visser 2021). These processes of incremental seizure of pastures and control grabbing have been noted by scholars working in and on the Central Asian region, but some did so before the height of the attention paid to 'land grabbing' and perhaps more important, often did not use the 'land grab' vocabulary. Another important aspect is that most of the Central Asian societies have had few links to global social movements (until recently), as authoritarian rulers have been stifling connectivity to external actors, and the political climate discouraged people from openly expressing grievances. As a result, major changes in control over and use of land that have taken place in Central Asia in the wake of the breakdown of the Soviet Union and more recently, concerning pastureland as well as arable (rain-fed and irrigated) land, have often not been picked up in the literature on 'land grabbing'.

Another, yet related factor that explains why Central Asia has not received much attention from scholars focused on 'land grabbing' is the fact that in Central Asia, compared with Africa, only a few cases of 'foreignization' (Zoomers 2010) of land have been observed—that is, land acquisitions by foreign investors. Until recently, only a couple of foreign investors have been engaged in large-scale farming in the region. Chinese land investments were reported in Tajikistan since 2012 (Hofman 2016), and there a number of foreign investors (indirectly) engaged in Kazakhstan's agricultural sector (World Bank 2017). Notably, after lengthy and repeated protests in Kazakhstan in earlier years—mainly driven by fears over the growing presence of Chinese actors—the government of Kazakhstan banned foreign ownership of land (Reuters 2021). Uzbekistan, another Central Asian country opening up its economy since the passing of president Karimov in 2016, has recently been receiving growing attention from foreign investors, but references to 'land' or 'control grabbing' remain few (see Schweisfurth 2021 as an exception).

At any rate, compared with African countries, the relative absence of foreign direct involvement in the rural economies of Central Asia is evident and may be related to several factors. First, Central Asia does not have strong historical links

to Europe or the United States, which reverberates in the region until today in terms of private trade and private investment from Europe and the United States, as well as of scholarly relationships and the presence of international NGOs. There is a broad array of NGOs present in Central Asia (mainly focused on the poorest economies—i.e. Kyrgyzstan and Tajikistan), but these organizations are oriented towards socioeconomic changes and development, and they do not seek to appropriate landed resources for private (profit-oriented) goals. Most of these organizations deliberately approach problems in an apolitical, technical way, including land concentration by elites, and, for instance, the elite-controlled cotton sector of Tajikistan. In other words, these NGOs abstain from engagement in political affairs, assumed to be an implicit requirement to secure a presence on the ground (Hofman and Visser 2021). Second, private companies (as potential investors) from Europe and the United States may consider the political risks of investment in agriculture too high.

Hence, various factors explain why Central Asia has remained more or less outside of scholarly as well as international media attention on 'land grabbing', even though one can observe pronounced inequality in access to land and in elites' control over land in several parts of Central Asia. In Central Asia, instead of transnational corporations or pension funds, it is mostly domestic elites who, sometimes gradually and sometimes instantly, have accumulated land and seized valuable former state assets. The 'land grab' discourse may be geographically confined and shaped, but this is not to say that these developments do not take place in localities where the specific terminology is not used.

The invisibility of common-pool resources

Social impact assessments of LSAIs in drylands tend to overlook the fact that users of land or other natural resources may lack formal titles while holding common access rights and may use the resources together with other (groups of) people. Some users, such as pastoralists, may access and need these resources only intermittently. For pastoralists and shifting cultivators, access to those parts of land is essential, but they may remain invisible in studies conducted only once—that is, in snapshot studies.

A recent study based on Land Matrix data concludes that LSAIs may gravely affect common-pool resources (Giger et al. 2019). The impact of LSAIs on common-pool resources (e.g. pastures, water, fisheries) has long been overlooked in the literature (for a critique, see Mehta et al. 2012; Haller 2019; Gerber and Haller 2021). However, attention is warranted: common-pool resources are key, especially in the drylands, where local communities and social groups depend on these resources for food security, sources of income, and thus livelihood resilience.

Common-pool resources in much of Africa and Central Asia have been subject to major transformations over the past decades, if not centuries. In Central Asia, the most significant overhauls in access rights to land and other natural resources started with the intrusion of Tsarist Russia, and more significantly when the region became part of the Soviet Union. However, this is not to say that there was

no inequality in landed wealth before, but major changes took place in the early 20th century. The Soviet leadership tried to eradicate pastoralism and industrialize arable as well as livestock farming, resulting in larger herds. Over the years, the Soviet state sought to introduce strict pasture use rights based on the units of large-scale farms, which allowed, for instance, (newly built) farms in Tajikistan's lowlands to practise transhumance and bring flocks to the highlands in the summer period, and vice versa. As Cameron (2018) described, groups in Kazakhstan experienced radical changes in the early Soviet years, resulting in a famine in the 1930s that has long been silenced and continues to receive little international attention. All land was nationalized, and the population was forced into Soviet state institutions.

In many countries in Africa, the colonial state started a process of state appropriation and centralized governance as well, that ignored the complex institutions that people in drylands had developed to govern common-pool resources—including different ontological views on what was meant by 'land'—and thereby maintained complex cultural landscape ecosystems (Haller et al. 2013; Haller 2019, 2020). These institutions coordinated users and user groups' access to common-pool resources with relatively few problems, as they incorporated and appreciated the dispersed, variable, and seasonal availability of natural resources characteristic of the drylands (as was the case in parts of pre-Soviet Central Asia as well). In doing so, they guaranteed flexible and mobile resource use and were underpinned by a conception of space as constituted by a constellation of 'places'. These places were continuously reconfigured by the movements of pastoralists, shifting cultivators, and fishermen, according to the availability of resources (Retaillé 1998, 2000; Retaillé and Walther 2011; Haller 2020). Land was not seen as a separate resource but as interrelated with all other resources (Haller 2019).

Colonizers in Africa introduced a different notion of space based on their own understanding, one that was strongly sedentary, based on a two-dimensional geometry and the idea that territory is divisible into political-administrative partitions and land parcels (Pase 2011). This notion was the basis for a key institutional change that would see the transformation of common property into state property. First, colonial authorities divided territories into categories (e.g. land for colonial settlers, protected areas), resulting in a disconnect between 'land' and land-related common-pool resources (e.g. wildlife, pastures, water). This process of resource management fragmentation furthermore separated common-pool resources into units that were governed by separate statutory laws and regulations, units whose management thereupon fell under different state departments and administrative organizations (e.g. department of fisheries, of forestry, etc.; Haller 2019). In this process, 'land' (particularly farmland) became a privileged category subject to property rights, while rights to common-pool resources were denied (becoming invisible to outsiders) as they were nationalized (Haller 2019). Such understandings of land are also evident in much of the literature on 'land grabbing', with its emphasis on 'land' and concomitant invisibility of impacts on common-pool resources and their users.

This classification of and bias in understanding land fed into the ways in which the postcolonial state understood and dealt with 'land' after independence, and

this came to play an important role in the neoliberal privatization policies of the 1990s, as it solidified a preference for private property and individual ownership of land and relegated common property and common-pool resources even further into the shadow (Haller 2019). International donors entering Central Asia after the breakdown of the Soviet Union pushed for legal fragmentation in similar ways through agrarian reforms geared towards land individualization and demarcation. Thus, historical institutional changes and fragmentation processes, in combination with a biased representation of mobile pastoralism as 'traditional' and 'backward' (Pouillon 1990; Ancey and Monas 2005; Haller 2020), have formed the legal basis for past and present appropriations of land and common-pool resources in these different parts of the world (Alden Wily 2013).

In the drylands, LSAIs have particularly affected transhumant pastoralists, whose mobility often reflects a rational, calculated response to seasonal climatic fluctuations (see also Gillin 2021). The impact of enclosures on groups that do not have a permanent presence in the area is often not recognized. Transhumant pastoralists regularly reserve particular pastures and watering places for periods of drought, and they may not frequent these places for years. Losing access to these resources may mean the collapse of their pastoral livelihoods during dry spells (Haller 2020). As a result, investors may not only 'grab' land, but also affect local actors' resilience (Haller et al. 2020). This can happen gradually, when resources are cumulatively taken away under successive waves of commons grabbing, such as experienced by the pastoral Peul in the Senegal River Delta (Benegiamo and Cirillo 2014, 2016, 2018; Cirillo 2017). This river delta was historically inhabited by several Peul lineages of transhumant pastoralists (Audru 1966). The availability of water in this dryland region made the delta attractive for colonial rulers who were interested in developing a large-scale plantation economy using local labour (Boone 2003). Indeed, since the colonial period, several projects to build irrigation systems have been pursued. These projects restricted pastoralists' access to water and pastures, reducing the local grazing capacity (Corniaux et al. 1998). The Peul lost access to collectively used water and land and were forced to adapt by changing their mobility patterns and livelihoods. Some started to engage in sedentary agriculture and reduced their herds to preserve access to the river. Others moved to 'residual zones' not yet affected by agricultural expansion, but this meant that they had to intensify their transhumant movements over shorter distances to navigate circumscribed access to resources (Cirillo 2017). One of these frontier areas was a protected zone, called Ndiael, demarcated around a wetland, where agriculture was forbidden but grazing was allowed. Eventually, this area became the last refuge in the delta for pastoralists pushed away by land enclosures for agriculture. However, in 2012, at the height of the renewed global interest in farmland, the national government allocated 20,000 ha of the protected area to a Senegalese–Italian agricultural company without consulting the resident pastoralists, justifying their allocation by referring to the 'emptiness' of the area (Cirillo 2017) (Figure 5.3). The LSAI threatened pastoralists' already limited access to common-pool resources—hence threatening their pastoral livelihoods (Benegiamo and Cirillo 2018). Following

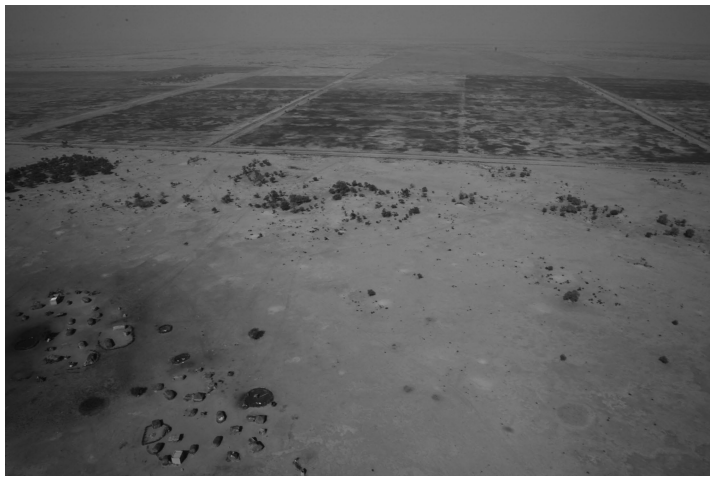

Figure 5.3 Expansion of the agricultural frontier in Ndiael, Senegal (2014). Photo taken by Giada Connestari and Davide Cirillo.

resistance and activist mobilization by a local grassroots movement, supported by national and international NGOs and think tanks, the Italian investor withdrew in 2017. The government of Senegal reduced the area of land allocated for investment to 10,000 ha, which stayed in the hands of the Senegalese investor. In recent years, pastoralists have continued their efforts to reclaim their rights to the land and have protested the lack of support from the government to develop their activities (Cirillo personal communication).

The invisibility of common-pool resources implies that the loss of access to these resources are often not fully or not at all included in compensation schemes. Investors involved in LSAIs regularly compensate local communities for the loss of agricultural land, but they do not always consider the loss of access to common-pool resources. Some investors also implement socio-economic development projects as part of their corporate social responsibility (CSR). When these are provided to people collectively, one could argue that they introduce new or alternative commons—in the form of, for example, schools, health services, community funds, and (irrigation) infrastructure (Haller et al. 2019; Gerber and Haller 2021). Case studies on such interventions in some countries in Africa, however, have shown that these provisions tend to fall short, as they cannot compensate for the resilience that the former (old) commons provided (Haller et al. 2019, 2020; Haller 2020; Gerber and Haller 2021). Compensation payments are often one-off and insufficient, and development projects are of a limited durability. Sometimes promises do not materialize. What is more, gains are often not well distributed (i.e. elite capture), such that those who most depended on the old commons lose most.

In short, the focus on '*land* grabbing' and *local* impacts in the literature on LSAIs and in compensation schemes seems to build on a tradition that neglects

the significance of common-pool resources for rural populations—particularly for non-sedentary periodical users and user groups—and the common-property institutions that regulate their use and access. In the drylands, commons grabbing is at least as important as, if not more important than, the grabbing of 'land' alone.

Forgotten failures

LSAIs do not always materialize or develop according to plan, yet 'failures', of any kind, have often remained invisible or hardly touched upon in the literature (for recent exceptions see Bräutigam 2015; Nolte 2020; Kronenburg García et al. 2022). This may be a result of snapshot studies, as organizations or researchers are unable to conduct longitudinal studies to evaluate how projects evolve over time. The emphasis tends to be on the early stages of development and expansion, often highlighting the impact investments have on local populations. However, attention to failures and operational struggles are of great relevance as they may reveal new and unexpected dynamics. As mentioned earlier, LSAI processes are far from linear: plans can be amended, interrupted, or sometimes completely fail. A range of (external and internal) factors, in isolation or combination, can cause such failures. External factors may include a change in commodity prices, difficulties in accessing international and domestic markets, financial issues, problems in electricity or fuel supply, and so on. Investors often do not report on their difficulties, but some recent studies have highlighted investors' experiences and struggles (Kronenburg García et al. 2022), including conflicts with farmers or pastoralists (see for instance Bertoncin and Pase 2012).

Many failures can be attributed to the 'one-commodity machine' logic (Scott 1998) that underlies LSAIs. In this regard, we identify three causes of failure. The first concerns the 'short-sightedness' of modern agriculture planning: investors are unable or unwilling to see what happens beyond a limited spatial and temporal horizon. They do not evaluate 'long-term outcomes (soil structure, water quality, land tenure relations) and third-party effects' (Scott 1998: 263–264). The second cause of failure concerns the underestimation of the complexity of large-scale agricultural production systems where everything has to work in unison to succeed and at the right time (e.g. arrival of fertilizers and seeds, diesel for tractors, electricity for pumps). The high dependencies among its constituent elements (e.g. hydraulic networks, machinery, pumping systems, maintenance) mean that the production machine is intrinsically fragile and susceptible to ruptures. The 'various components are difficult to fit into place at the same moment: besides the construction of the irrigation works, land has to be distributed and settled, new crops have to be grown and new markets found' (Hirschman 1967: 43). The third causal factor concerns the rigid nature of LSAIs, which hinders the ability to cope with climatic variations and social complexities (Bertoncin and Pase 2017; see Chapter 4, this volume).

When LSAIs enter into crisis or fail, this sometimes provides opportunities for local populations to re-appropriate and regain access to land and other resources. The Chikweti/Green Resources investment discussed earlier eventually

faced difficulties and ran into problems (Kronenburg García et al. 2022), and in 2020 the investor even transferred 54,000 ha of land back to local communities.[4] In other places, re-appropriation may take place in a situation of open access and conflict as a plethora of historical and new users rush to seize assets and benefit from resources. Gradually, however, new understandings and practices for resource use may emerge. This happened in the site of a former large-scale, state-run project near Lake Chad. The South Chad Irrigation Project on the Nigerian shores of Lake Chad was initiated in the 1970s, but it ran into problems during the 1980s' droughts and struggled to recover afterwards owing to reduced government funding. In the late 1980s, the South Chad Irrigation Project was effectively abandoned (Bertoncin and Pase 2017). However, along the intake channel, farmers and pastoralists slowly rebuilt their livelihoods by using abandoned LSAI infrastructures and combining new and old forms of knowledge and techniques in unexpected ways (Bertoncin and Pase 2017; see Chapter 4, this volume). In these interstices, common-use institutions for resources came into being, offering people the opportunity to take advantage of LSAI remnants, but in a way that was sensitive to the climatic and environmental vagaries of the drylands.

Discussion and conclusion

In this chapter, we shed light on the intricacies of studying and analysing LSAIs in dryland areas. We illuminated the blind spots we observed in the literature. These blind spots particularly relate to important aspects, not considered or not fully understood, yet of great relevance or specific to the drylands and essential to understanding the impact of LSAIs on dryland users.

First, we addressed the need to analyse the multidimensional impact of LSAIs by using a longitudinal and historically grounded research design, one that integrates past (colonial and even precolonial) uses and ontologies of land and common-pool resources and the past institutional fabric that regulated access to and management of those resources. Such an approach allows for capturing the ways in which projects or investments change or are amended over time and for how past changes feed into or even facilitate recent dynamics. We need to be attentive to institutional transformations from common to state and private property, because the latter is the basis for LSAIs. Longitudinal studies can also reveal that some projects are less gargantuan than initial figures may have suggested, or that projects have not materialized at all. Thus, it is imperative to regard LSAIs as processes whose outcomes are not predefined. Often LSAIs unfold or evolve in different steps, stage-wise. A longitudinal approach also allows researchers to identify diverse kinds of commons. These include what we could call 'old' commons—that is, the common-pool resources used prior to LSAI implementation, and the locally developed common-property institutions that regulated access and use. 'New' commons may appear in the course of LSAI development, such as the collective compensation payments and CSR projects set up by investors. Lastly, specific kinds of commons may come into being when LSAIs are abandoned or fail. We could call these 'interstitial' commons, which

emerge after local actors re-enter areas and rebuild their livelihoods in alternative ways, among abandoned infrastructures, adapting to the changed access to local resources and in line with the climatic variability and variable resource availability of the drylands. As such, local actors demonstrate agency and adaptive capacity to deal with a changing environment.

Second, in-depth, longitudinal research is also essential to covering the seasonal and inter-annual variability that characterizes drylands. This is particularly imperative to appreciate resources that are not always clearly visible throughout the year. For instance, water resources, or grasslands, may be more or less observable by a layman's eye, as their discernability is affected by seasonal characteristics, particularly erratic rainfall.

Third, and related to the above, drylands imply that analysis should appreciate mobility. Pastoralists are often represented as backward and sometimes even irrational. Some actors may therefore consider drylands as wastelands, useful only for livestock grazing. The value of such areas for mobile livelihoods is not always fully understood. However, it is precisely pastoralists' mobility that shows their adaptive capacity and their resilience. Mobility is what allows them to resiliently make use of common-pool resources, to adapt to the seasonal and spatial availability of land-related resources. The enclosures of land and the pressures to settle undermine pastoralists' livelihoods and may cause their disappearance.

Fourth, we highlighted the need for a different way to understand who or what is defined as 'local'. Local actors may include elite individuals, privileged and under-privileged individuals and groups, who all have their own interests and distinct ties to land and other resources. LSAI impacts are thus differentiated. Relatedly, the continuous and geometric space of the Western and 'sedentary' conception of the world provides for clearly delineated rights to (agricultural) land, but this does not match the characteristics of drylands, where one place is lived and experienced in multiple ways, at different times and by different users. More than a 'topography', there is a need for a 'topology' of space in drylands that ensures a plural, open, and ever-changing view of what is 'local'.

Fifth, we highlighted the importance of attending to framing, discourse, and language—that is, the specific vernacular used by internal and external actors to discuss, talk, and report about trajectories of land-use change in general and LSAIs in particular. This allows for understanding and observing parallel tendencies across localities and continents, similarities that remain concealed if one attends alone to English, French, or Spanish publications that refer to 'land grabbing'. This also means that analyses of impact should look beyond the appropriation of land alone, to also look at the appropriation of water flows and other kinds of commons (commons grabbing). Control grabbing can be equally pronounced, including the control over specific uses of land (labour). The latter may mean that not only do investors or other actors enclose land and therewith block outsiders' ability to enter, but they may also appropriate the power to determine specific use of dryland areas and natural resources. In that way, they take away people's and ecosystems' resilience. This sometimes happens gradually, cumulatively, when LSAIs develop over time.

By placing a spotlight on these blind spots and suggesting ways to examine the impact of LSAIs in drylands, we hope to contribute to the work on and the lives of those who depend on drylands. This should serve to protect the strength of mobile livelihoods and the resources on which they depend. As also noted in various other chapters of this volume, a holistic approach to studying dryland livelihoods, and the lived social and environmental changes and continuities in the drylands, is essential to gain a nuanced understanding of areas undergoing socio-political and environmental change.

Notes

1 We thank Jeroen Warner for feedback on an earlier version of this chapter.
2 https://landmatrix.org/ [Accessed August 2020].
3 'Large', however, can also refer to the size of financial flows or to the impact on livelihoods and/or the environment.
4 https://clubofmozambique.com/news/mozambique-green-resources-relinquishes-54000-hectares-of-land-in-niassa-report-176557/ [Accessed 25 March 2022].

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6 The 'open cut' in drylands

Challenges of artisanal mining and pastoralism encountering industrial mining, development, and resource grabbing

Troy Sternberg, Matthieu Bolay, Tobias Haller, and Thomas Niederberger

Introduction

The history of mining in drylands extends for thousands of years. In antiquity, the Persians, Egyptians, and Romans were masters of extraction as gold, copper, silver, and so on were mined across the Middle East and Africa (Bromehead 1940). Mining is documented for millennia across the Central Asian and Mongolian steppe (Hsu et al. 2016). Nixon et al. (2011) write about copper extraction in the Sahel a thousand years ago and note that the Malian empire was the world's major gold producer in the Middle Ages (Kevane 2015). While the context and methods have evolved over the centuries, mining continues to configure society and arid environments from the Sahara to the Gobi. In these locales, pastoralists and agrarians have practised customary livelihoods for generations; today artisanal mining, multinational corporations, terrorist groups, and states all seek to control or derive benefit from resource extraction. State actors, mine license holders, and armed groups compete and conflict with communities over traditional land use. In marginal drylands, mining's detrimental impacts affect inhabitants, local governance, security, and livelihoods.

Drylands are contentious mining zones due to limited water, marginal environments, and extensive livelihoods such as pastoralism and subsistence farming. The common notion is that drylands are wastelands and thus exploitable (Mortimore et al. 2009). Here, we investigate mining struggles in two drylands—the Sahel (Niger, Mali) and Inner Asian Gobi (Mongolia)—where a confluence of forces present mining-related challenges to agro-pastoralism, including challenges of reduced mobility, social viability, pollution of resources, and state security (Niederberger et al. 2016; Sternberg et al. 2020). Previously considered 'remote', drylands are now at the forefront of climate change, sociopolitical conflict, resource extraction, and state fragility. Residents, often mobile pastoralists, agriculturalists, or artisanal miners, experience rapid transitions that reconfigure lives, land tenure, mobility, and common-property institutions. Degradation and fragmentation of grazing lands from mining processes impact land use, migration, and animal and human health, and they undermine resilience and livelihoods

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(Haller 2020). In the Sahel, armed militia and terrorist groups assert authority over vast regions as state control dissipates. In Mongolia, climate variability and water conflicts related to mines threaten pastoralists where precipitation is less than 100 mm annually. Dryland marginality—low moisture, limited ecological productivity, distance from services—is further exacerbated by the new social and economic forces initiated by mining.

Outsiders from urban centres or foreign investors can control land and overrule customary tenure patterns. Commons grabbing, a consequence of resource extraction, undermines local people (Haller 2020) via state legal enforcement, where mining licenses exert economic influence and impose overriding, legalized rights (Niederberger et al. 2016). The endemic challenge of access to water as a scarce and unpredictable resource is complicated by mining's massive demand for water. Furthermore, climate factors disproportionally affect environmentally based agro-pastoral lives. Here, historically rooted land-grabbing processes can nullify notions of territoriality and acceptable land use, as core livelihoods are peripheralized and made untenable (Haller 2019).

The inexorable demand for minerals, funded by international investments, has long dominated desert spheres. Driven by the market value of certain minerals (e.g. lithium, rare earth elements, graphite) for so-called green technology intensifies mineral production (Vidal et al. 2013; Sovacool et al. 2020). Mining-community conflicts, once about jobs, local benefits, and degradation, and intensified by climate factors, are now also about investment schemes and state development. These processes are tracked on social media by civil society and international agencies. Reflecting global agendas, our Sahel case study, with its mines important for France in relation to its colonial legacy, is a context hosting the French military and encountering insecurity driven by extremist groups and migration routes to Europe. Mongolia, on China's border, has become the latter's largest source of coal imports: it promotes resource nationalism, though mining accounts for 80% of exports (Enkhjargal 2021). Business models and infrastructure development seldom consider desert residents, nor does the rush to extraction recognize artisanal mining as a worthy or viable option. Licenses are issued in capital cities, while impacts are felt in rural peripheries; the story on the ground is one of rapid transition, a struggle to sustain livelihoods, and communities deprived of state support and even minimal public services.

The business strategies and perspectives in our focus regions centre on multinational extraction by corporations such as Rio Tinto in Mongolia, Centerra in Kyrgyzstan, and Areva in the Sahel, joined by Chinese firms as part of the Belt and Road Initiative. These multi-million to multi-billion US dollar investments generate significant state revenue and political support. Their ability to obtain mining licenses often contravenes existing communal land use and tenure systems, contributing to local uncertainty and income loss. The intensification and technological levels require skills beyond those of local communities, with residents neglected or displaced in this approach. Existing livelihoods are disrupted as control and militarized enclosures (fencing, securitization, closing off of water access) discourage artisanal mining, livestock grazing, and farming. Responses

vary from an exodus to urban centres, to affiliation with non-state organizations such as the many extremist groups that have mushroomed in the Sahel. Residents are unable to hold responsible parties to account—industry claims license requirements are satisfied, while government engagement in rural drylands is weak or absent and is increasingly discharged to mining companies (Bolay and Knierzinger 2021). Mining activities transition communities away from past practices to new uncertainties.

This chapter illustrates mining implications, through dryland case studies in the Sahel region (uranium in Niger, gold in Mali) and arid Mongolia (gold, copper). State involvement enables a discourse promoting development that contributes to a positive framing of mining in drylands. Resulting economic dependency and environmental degradation are externalized, borne by local people, their livestock, and future generations. In weak states, this opens access for the most powerful actors. Common strategies of transnational mining companies across drylands reflect their collaboration with state actors and their impact on development discourse.

Asymmetric power conflicts surrounding mining activities are often presented negatively as being between local actors and companies and states. Yet one case study identifies how a community and mine were able to reduce conflict through dialogue and mediation (Sternberg et al. 2020). Here, the mega-mining transition has already occurred; the community now adapts to the resultant changes, which are improved by facilitated discussion.

Though separated by distance, history, and culture, the Sahel and Gobi share the *process* of mining, experiencing the disruption to communal lands and mobile lives and the uncertainty about future roles for the actors involved or affected by mining projects. This reflects the arid zone conundrum of protecting lives in regions considered expendable wastelands. Moving beyond local contexts, the points raised are common across global resource extraction: its impacts and local responses to them. Our insights expand documentation and discussion of communities facing the 'open cut' (surface excavation) of mining that challenges dryland homes, mobility, and flexibility. They also exemplify different ontologies regarding what constitutes the so-called environment or cultural drylands landscapes for local actors, on the one hand, and a mineral asset for exchange between local actors and the mining companies, on the other hand. However, our study also shows that there have always been local mining strategies embedded in early empires as well as in today's transnational corporate business, which is a further 'glocal' link full of power asymmetries.

Undermining pastoralism: uranium mining in Niger

The case of uranium mining in the Sahel-Sahara in northern Niger is a paradigmatic example of the 'faux construction' of drylands as 'marginal' regions. Niger is consistently considered a 'poor' and politically powerless country, ranked at the bottom of all global development indexes and hardly ever mentioned in international press coverage, unless for the surge of violent extremism. Even more,

the desert of northern Niger is further marginalized within the national political setting dominated by ethnic Haussa elites from the southern capital of Niamey. However, this perception of marginality is also faux, if one takes into account that uranium from Arlit has been a central element to every French household and industry, as well as to the geo-political positioning of the former colonial power that became one of a select few 'nuclear powers', with a permanent seat on the UN Security Council. France, which relies on nuclear energy for 80% of electricity production, sources between 25 and 40% of its uranium fuel from Niger (Granvaud 2012: 63), with Australia, Canada, and Kazakhstan also notable suppliers. The marginal position of Niger, which may at first glance seem an 'obvious consequence' of its 'remote and hostile geography', is in fact the result of a systematic process of invisibilization along the production line of a key ingredient to the French economic and political model, a model that revolves around nuclear power for electricity and the deterrence effect of nuclear weapons.

The Niger case also shows how large-scale mining has severe impacts and transforms the entire political and ecological landscape far beyond the surroundings of actual mining sites. It illustrates some of the specific characteristics of mining impacts on the inhabitants of drylands: (1) the increasing scarcity and contamination of water and the resulting aggravated competition over this vital resource; (2) the impact on movement and migration patterns, including the sedentarization of (formerly) mobile pastoralists; and (3) the intensified political marginalization of already discriminated-against indigenous peoples (in this case, the Tuareg Berber nomadic pastoralists), leading to very limited options for them to express opposition through democratic deliberation, which in turn favours a pattern of retreat and sometimes violent confrontation. Not all of these impacts can be attributed exclusively to the mining activity; however, all of them are further exacerbated by it.

Uranium mining in Niger began in 1971 at the open-pit mine SOMAÏR (Société des Mines de l'Aïr) in the proximity of the northern Niger settlement called Arlit, which consequently grew into a major town. This was followed in 1978 by the underground mine COMINAK (Compagnie Minière d'Akouta), close to Akouta. Both mines were under majority ownership and operated by Areva, a company controlled by the French state. Due to high prices, uranium exploration activities multiplied in the 2000s, bringing in a multitude of investors from different countries (notably, Chinese) (Gagnol and Afane 2010; Oxby and Walentowitz 2016). The uranium price fell following the Fukushima nuclear disaster in 2011, and the projected boom came to an abrupt halt. The Imouraren project by Areva, planned to become the second-largest uranium mine in the world, was stalled at an advanced stage of development. Areva was finally restructured and renamed Orano in 2018. In March 2021, production at Akouta (COMINAK) was terminated definitively, after 75,000 metric tons of uranium had been extracted over its 40 years of existence. The closure leaves 600 employees and at least 800 subcontractors behind, besides an unknown number of people who depended on secondary income from the mine.[1]

In the 2000s, uranium exports made up 60–80% of Niger's foreign exchange revenues (Oxby and Walentowitz 2016: 165). However, the inhabitants of northern

Niger have seen little benefits from this. The region is part of the vast ancestral territories of the five Tuareg confederations (the Kel Ahaggar and Kel Ajer in the north, the Kel Tademakkat and Kel Ayer in the east, and the Kel Tagaraygarayt at the centre). Traditionally, the Tuareg are nomadic pastoralists who combined camel pastoralism with long-distance trade across the desert, using water sources and seasonal pastures on the way, with annual transhumance to the salt pastures in the south (Claudot-Hawad and Lefèvre-Witier 2009). The latter took the shape of large social gatherings known as *tenekkart* or *cure salée,* with an important centre in the Nigerian locality of La Gall. These gatherings, which also served as political assemblies, were prohibited by the colonial administration. Also, the complex and highly adaptive system of customary rights of access to pastures and water sources was systematically ignored, neglected, and obstructed by colonial and postcolonial authorities. Tuareg refers to this oppression as *ahluk n temust* and *ahluk n tamattay*, 'meaning the "annihilation of a nation" or "people" through the avoidable destruction of elements, persons, resources or cultural assets that are critical for its cohesion and survival'. In their perception, it is an existential threat to their society and to the environmental conditions for survival (Oxby and Walentowitz 2016: 160–161).

The imposition of mining areas and towns on customary Tuareg lands led directly to the disruption of access to water sources and pastures and the distortion of migration routes. The production processes of uranium require large quantities of water, which is pumped up from underground, in part from non-replaceable, fossil aquifers (Dixon 2010: 21–22). Underground mining lowers the water table and may make wells run dry. Then there is the contamination by radiation and the use of chemical agents for the leaching process, which affect all dimensions of the cultural landscape ecosystem: water, air, and soil, as well as human and non-human health (Collectif Tchinaghen 2008; Dixon 2010; Oxby and Walentowitz 2016: 196–176). There is a lack of systematic data collection on environmental and health impacts; however, the available sources indicate elevated radiation levels, while data on incidence of cancer cases is being suppressed by local hospitals, which are under the control of Areva (Granvaud 2012; Oxby and Walentowitz 2016; Weira 2016). This points to a common corporate strategy of producing 'doubt' on the actual costs of extraction (Nixon 2011: 39).

However, a focus on these direct impacts alone risks neglecting the severity of indirect impacts related to the change of movement patterns of the Tuareg nomadic pastoralists. The disruption of their traditional trade routes and associated relationships with settled farmers, exchange of agricultural products with animals, salt, and manufactured goods brought across the desert, which dates back to the colonial period, was further perpetuated and exacerbated by the arrival of uranium mining in Arlit (Oxby and Walentowitz 2016). It continues to do so: for the (later stalled) project at Imouraren, the company Areva again ignored the presence of pastoralists in the 200 sq km extension of the area it acquired for the mining pit and industrial installations, thereby denying its responsibility to agree on compensation with customary owners (Gagnol and Afane 2010: 9–13).

The development of mining towns, with their promise of economic opportunities and access to services, incentivized the sedentarization of pastoralists. However, the access for pastoralists to education and better-paid formal employment remained very limited, leaving as options only the most precarious jobs and subsidiary economic activities, such as petty trading and services. The precarious nature of the informal economy around the mining sites in Niger is illustrated by the fact that for many years the trading of radioactively contaminated scrap metals from the mine was adopted as an income-generating activity by some Arlit residents, until this was apparently brought to an end by the company (Weira 2016).

For younger people, especially men, the lack of alternatives contributed to migration to neighbouring countries, sometimes to work as mercenaries in Libya under Muammar Gaddafi (Krings 1995). After the droughts of the 1970s and 1980s, many lost their livestock and had no choice but to move to look for other occupations (Spittler 1993). After the fall of the Gaddafi regime in 2011, many returned to Niger and sought other income opportunities, related to the transformation of ancient trade routes across the desert. Some of them became involved in the transport of migrants from Sub-Saharan Africa to the north (labelled as 'human trafficking'), illicit activities such as the arms and drug trade, and the 'business' of kidnapping 'expat' mine employees to negotiate political influence and ransom payments (Scheele 2012). Since 2011 many have also joined Muslim extremist groups (Bøas 2015; Thurston 2020; Chapter 9, this volume). Such activities obviously play into the framing of the region as home to 'unruly tribes', which dates to colonial times, and a renewed negative labelling as an 'extremist' and potential 'terrorist' space, seen from a European, especially French, perspective.

The region has a history of Tuareg armed rebellions, such as those in 1990–1995 (Krings 1995) and in 2007 (*Mouvement des Nigériens pour la Justice*; see Denis et al. 2008; Keenan 2008, 2009). However, this became of special concern internationally in 2012 with the AZAWAD movement, due to the strategic (if temporary) alliance of certain Tuareg leaders with Al Qaeda-related groups, who quickly managed to take control of northern Mali (Claudot-Hawad 2013; Zounmenou 2013; Oxby and Walentowitz 2016: 158). Although many Tuareg leaders were killed by Al Qaeda activists trying to take control of what started as a rebellion led by Tuareg, the episode led to the Tuareg's becoming a target as potential 'terrorists', within a fortified labelling of the Sahel as part of a dangerous 'terrorist ideoscape' (see also Andersson 2016; Haller 2020).

In contrast to other minerals, it is impossible to develop artisanal mining for uranium, and in contrast to other examples described in this chapter (Mali–Guinea and Mongolia), northern Niger did not know artisanal gold mining until recently. The discovery of gold by small-scale gold diggers, first in the Ténéré desert in 2014 and later in the Aïr Mountains, came as a big surprise (Grégoire and Gagnol 2017). Within months, the region became crowded by thousands of artisanal miners and providers of related services, including many Tuareg, impoverished city dwellers from Arlit and Agadez, and 'Libya returnees', as well as people from southern regions of Niger and neighbouring countries—in total, estimated

in 2017 at 70,000 people, mostly men (ibid. 15). Though new in the region, this source of livelihoods extends the space of artisanal gold mining, whose dynamics have been at play for a number of years in the southern regions of Liptako-Gourma, and more broadly along the Birimian Belt in Mali and Guinea. While the government of Niger first tried to prohibit the irregular mining owing to security concerns in and around the fast-sprawling mining camps in the 'unruly' border region, it quickly became clear that the income generated there constitutes a stabilizing factor, keeping unemployed youth away from more problematic activities and preventing the risk of another Tuareg rebellion (Chevrillon-Guibert et al. 2019; Afane and Gagnol 2021).

The emerging scenario in northern Niger is thus marked by a new dynamic between a declining, highly centralized, industrial type of mining (uranium), controlled by a quasi-state-like power, Areva, and the sprawling dynamic around the informal gold-mining camps, each with its own boom-and-bust cycle. The recent closure of the uranium mine at Akouta and the loss of related subsidiary economic activities may also contribute to a further push into artisanal mining. The situation presents stark evidence for what has been criticized by local activists and NGOs: although built on a discourse of 'development' and 'progress', uranium mining has left little lasting benefits in the area. Instead, its legacy is a polluted environment, exhausted natural resources, and severe health problems. In contrast, for the gold mining at least, the distribution of income seems to be comparatively more equal, and local Tuareg has greater chances to participate thanks to their superior knowledge of the territory. This does not change the fact that artisanal mining causes considerable damage to the environment and health condition of workers, especially where mercury and cyanide are used. It remains uncertain how long the currently exploited deposits, and others yet to be discovered, will last.

The adaptation strategies of Tuareg (former) pastoralists to mining can be described as a combination of changing movement patterns and related income-generating activities, especially forms of trade, with temporary settlement in the mining towns and, recently, the adoption of artisanal gold mining. A fundamental opposition to uranium mining is apparently absent; rather, the unjust distribution of mining incomes, the lack of investment in public infrastructure and services, and the impacts on health and the environment have been questioned, especially since the last peak of uranium prices in the 2000s (see e.g. Collectif Tchinaghen 2008). However, the chances of successfully achieving significant improvement in these areas have been quite limited. It is notable that some of the frequently observed strategies adopted by communities in conflicts related to large-scale mining worldwide do not seem to be very effective in northern Niger—including mobilization through civil society networks, social movements, labour unions, and political parties on different scales, and from local to international advocacy networks, with mass protest and direct action such as roadblocks to disrupt production (see Niederberger et al. 2016: 468–488). One reason may be that the characteristic 'drylands' social structure of mobile pastoralists does not favour the everyday resistance practice of 'staying put' (Jenkins 2017)—that

is, the refusal of settled communities to be reallocated elsewhere to make way for mining operations, which again forms the basis on which political mobilization can build. Another main hindrance is the political marginalization of the Tuareg people, which was further accentuated after they were branded as potential 'terrorist supporters' and drawn into the field of the global 'war on terror'. This makes legitimate resistance against environmental impacts and the unfair distribution of mining incomes more difficult. The 'terrorism ideoscape' here works as an anti-politics machine, which closes the space for democratic deliberation and makes invisible the underlying power relations that are at the root of the problem.

Local artisanal mining as an alternative? Views from gold mining in the Sahel

If one analyses the case of a classic mining constellation such as that in Arlit, one wonders if, from a drylands perspective, local mining activities might be a much better option in drylands. Gold has been mined for centuries in this region and historically was the founding economic element of large states in the Sahel (e.g. Mali empire, Songhai empire, and Kanem Bornu between the 14th and 16th centuries; see Ki-Zerbo et al. 1979). However, gold mining in the area is not only a resource use strategy from the faraway past; over the last 20 years, gold mining has literally exploded in West African drylands along the Birimian Belt, which spans eastern Senegal, upper Guinea, southern Mali, Burkina Faso, and Niger, and more recently across the Sahara, with artisanal mines mushrooming in northern regions of Mali close to Kidal, and in the Aïr and Djado in Niger. In these countries, artisanal mining is estimated to provide direct employment to at least 2.2 million persons and livelihoods for at least five times more dependants (Delve database, IGF 2017). Driven by massive unemployment, food insecurity and poverty, and conflict-induced displacement from northern areas controlled by extremist groups, artisanal mining, which is found ubiquitously beyond the controls of legal formality, has become the second source of income for rural livelihoods in the region. In parallel, the wave of the fourth generation of mining codes since the 2000s (Besada and Martin 2015) also led to an increase in industrial mining operations and an unprecedented allocation of exploration and exploitation mining licenses, currently covering nearly every portion of the Birimian Belt. This generates state revenues through permit fees, royalties, export taxes, and government shares in industrial mining ventures. Yet, this 'mineralization of Africa' (Bryceson et al. 2014) also drives notable negative consequences. Among the most prominent ones, both the use of mercury and cyanide, in artisanal and small-scale mining (ASM) operations, and massive landscape destruction in and around industrial mines are important causes of environmental degradation. Competition over access to mineral deposits between various operators on the artisanal/informal—industrial/formal continuum is also a recurring source of social conflict, whose violent responses sometimes provoke dramatic outcomes (e.g. Dessertine 2019; Bolay and Knierzinger 2021). More broadly, the uneven distribution of the extractive rents is also a frequent matter of political contestation.

In contrast to mining expansion in so-called new gold frontiers (Verbrugge and Geenen 2019) such as Mongolia (Sternberg et al. 2020), these issues take on particular meanings in West Africa, where gold mining dates back to the former African empires during the Middle Ages. Not only has this long history of mining led to robust local institutions governing access to gold deposits and control of mining dividends, but it has also fostered a peculiar sense of ownership in mining regions that new technologies, legal frameworks, and migrations destabilize and transform. Gold is found both in primary (rock) and secondary (alluvial) deposits and is artisanally extracted and processed in strongly gendered work arrangements, whereby men team up to excavate wells and tunnels to access and extract the ore, which women then process and wash on the surface. Following a common-pool resource conception of land, the repartition of the gold then follows a complex arithmetic, usually involving the local landowner, the sponsor of the diggers, the operators providing technical supports (mechanized crushers, air pumps, water pumps), the male diggers themselves, and the female washers with whom they are associated, as well as the payment of local taxes to village authorities (see for instance Bolay 2014; Teschner 2014; Lanzano and Di Balme 2017; Brottem and Ba 2019).

In historical zones of extraction, such as in the Bouré and Bambuk areas of current Senegal, Guinea, and Mali, the governance of mining sites is performed by a local non-state police (*tom bolomaw*), who regulate conflicts and collect informal local taxes that contribute to financing most public infrastructures, such as mosques and road maintenance. In more recently exploited deposits, such as in Burkina Faso, the governance of mining sites has more tenuous ties with local governance structures. While first relying on Big Men logics (Werthmann 2003), *comptoirs* (private buying houses holding capital) took over this role by navigating formal and informal spheres of access (Di Balme and Lanzano 2013). Yet the prominent role of *comptoirs* is increasingly contested by local groups reclaiming governance prerogatives (Lanzano and Di Balme 2021). In both historical and new mining areas, by providing employment, revenues, and tangible local development, artisanal mining is systematically preferred locally to industrial mine projects, which are perceived overall by local populations as a threat to access to land, gold deposits, and labour options.

The tense relations between the artisanal (and informal) and industrial (and formal) sectors have been at the core of international-level policy concerns and are the object of various governmental measures to 'formalize' the artisanal sector—that is, to expand property rights systems to absorb the extra-legal economy (Siegel and Veiga 2009: 53), as promoted by major donor institutions. Yet, this agenda has so far brought at least ambiguous outcomes. Legal projects to formalize the artisanal sector have so far inevitably been paired with the marginalization, or even exclusion, of the most vulnerable actors (e.g. Hilson 2013) and the sector as a whole being *de facto* placed mainly in the realm of illegality. Different approaches have been taken, ranging from the establishment of legally dedicated ASM corridors to imposed registration and acquisition of a *carte d'orpailleur* (miner's card). A common trend has been the progressive institutionalization of governments'

practices of the expulsion of illegal miners from the temporary mining camps next to the artisanal mines (e.g. Dessertine and Noûs 2021) or from corporate-owned leases (e.g. Bolay 2016). While such context-specific interventions tend to occur at the early stage of exploitation, when competition between large-scale and small-scale operators is the most salient, attention to previous and subsequent stages of the life cycle indicates that the boundaries between both sectors are more blurred than they at first appear.

Indeed, as shown by Luning (2014) in Burkina Faso, artisanal miners often serve as easily removable 'pathfinders', whose activity is an indicator of the potential viability of gold deposits for junior mining companies conducting exploration. In addition, as observed in Mali, the acquisition of exploration licenses also happens to be used by trade actors, with no future prospects in formalized operations, as a means of exerting pressure on artisanal mining communities—by upholding the threat of eviction—to secure access to their product (Bolay 2021a). Conversely, once industrial operations have reached their limits, artisanal miners frequently occupy abandoned sites to scavenge the leftovers, a practice also noted in Mongolia. This trend has been reinforced with the relative retrenchment of industrial mines due to decreasing prices since 2012–2013 and by the booming use of cyanidation, techniques to retrieve gold from tailings (Lanzano and Di Balme 2021), without which such leftovers would not be profitable to artisanal operators. This is even more so in African drylands where scarce access to water is largely compensated by the use of chemicals to process the ore (OECD 2018).

Yet the 'dryland' characteristic of a region cannot be subsumed to water scarcity. It also needs to be considered from the perspective of the fragmented sociopolitical configuration of the Sahara–Sahel, where postcolonial states always had a limited presence and where populations have long resorted to flexible and diverse livelihood strategies (van Dijk 2017: 120)—making use of both their own mobility and the mobility of people and goods across loosely controlled territories (see for example Scheele 2012). Miners' intense transnational mobility across the region is a key driver of the sector's transformation from below. Besides playing an important role in the discovery and exploitation of new deposits, the mobility of miners also sustains the circulation of new processing techniques, such as with the boom in the use of mercury 15 years ago in Ghana and progressively across the continent, and that in cyanide more recently. The recent 'rush' in northern Mali illustrates such dynamics. Rather than an expansion of long-standing mining practices from the Birimian Belt up north, the artisanal mining boom in the northern Sahel results from a 'pioneering front' initiated in early 2010 in Egypt, which steadily expanded across Sudan, Chad, Niger, Mali, and Mauritania (Chevrillon-Guibert et al. 2019). In the Kidal area (Mali), where artisanal mining operations have multiplied since 2016, workers are rarely Malian, Guinean, or Burkinabés such as in the cases mentioned above. While governance and financing are controlled by local Malian Tuaregs—with or without the support of various rebel groups that govern fragmented portions of territory along fast-shifting alliances and allegiances (Sandor and Campana 2019), under equally fast-changing qualifications of rebellion, jihadism, or terrorism (Pérouse de Montclos

2018: 12–17)—most miners came from Niger, Chad, or Sudan, together with their experience and techniques of extracting gold in Sahelo–Saharian contexts. In the artisanal mining sites around Kidal and Tinzawaten, primary ore is extracted in shafts up to 40 m deep. Then it is transported to Kidal, where several cyanide-processing plants were set up (Bolay 2021a) in a similar way to what Afane and Gagnol (2021) describe for the sites surrounding Agadez and Arlit in Niger. In these areas that constitute important transit points for aspiring migrants to North Africa or Europe, increasing numbers of impoverished irregular migrants deported from Algeria and Libya may also turn to mining, which sometimes constitutes a temporary safety net (Bolay 2021b).

To conclude, artisanal mining in the Sahel is shaped by heterogeneous drivers that, besides the geological features of the deposits or the dry environment, also depend on whether or not artisanal and industrial modes of production intersect, and at which stage of the mining cycle (i.e. exploration, development, production, closure, possible rehabilitation, or re-occupation), with actors that most effectively control portions of the territory. In addition, while artisanal mining constitutes a growing source of income in the region, its economic role is as diverse as to seasonally complement agriculture, to become a full-time job involving frequent relocations induced both by forced expulsions and the search for new deposits, or to temporarily provide incomes to people whose mobility or economic activity have been hampered.

Mining and pastoral engagement in drylands: the Mongolian context

In our case study from Inner Asia, the relation between local mining and mining by corporations is again shaped in a different way. This case shows how local mining activities are possible after large transnational mining companies terminate mining. It also illustrates a context where local dryland inhabitants, mainly pastoralists, were able to successfully challenge mining companies (see also Chapter 13, this volume). Both processes coexist across the communal landscape (Figure 6.1).

Across the Inner Asian steppe, mining drives economic development, exports, foreign relations, and political outcomes (Sternberg 2020). Yet in Central Asia and Mongolia, complaints about a lack of local jobs, environmental damage, community disruption, and elite capture frame national discourse. This segues into resource nationalism as citizens clamour for clear social benefit from resource extraction and state takeover of foreign mining investments (Myadar and Jackson 2019). In Mongolia, such topics lead to struggles over mining with a government focused on industrial operations, while 20% of the rural labour force work as artisanal miners (Bryceson 2018). Both approaches affect landscapes and water quality and access, and cause pollution. Processes initiated by extraction lead to rapid social change and disorientation, as herders may lose access to limited water points, be excluded from pasture claimed by mines, or become part- or full-time miners to sustain livelihoods. Perceived income opportunities, or lack of

Figure 6.1 Herders' view of mine in Mongolia. Photo provided by Troy Sternberg.

alternatives, drive both migration to mining hotspots and displacement to towns and the capital when rural endeavours lose viability.

Mining lifecycles reflect a well-documented process of exploration, extraction, and closure that is common around the globe. In Inner Asia, the process is framed by Soviet legacies and practices that were followed by state collapse, impoverishment, and a turn to mining for income and revenue (Sternberg et al. 2021). Hope for mining-led development is moderated by awareness of potential damage. Whereas Soviet-era companies created mining towns with schools and infrastructure (Tursalieva 2021), today's large-scale investments (often Chinese- or Western-owned) sign licenses and pay taxes in the capital, with limited engagement in rural communities. Historical memory raises expectations, yet contemporary extraction provides limited jobs for rural residents, as workers are often brought in from China (Sternberg 2020). A more common practice is artisanal mining, known colloquially in Mongolia as 'ninja mining', which has numbered 100,000+ miners over the years (Lahiri-Dutt and Dondov 2017; Munkherdene and Sneath 2018). The process was driven by poverty, opportunity, and extreme climate events (temperatures as low as −45°C) that displaced pastoral lives (Lahiri-Dutt and Dondov 2017). The intersection of industrial and small-scale mining flourished in the 2000s when, as a mine site was closed, locals scavenged through mine tailings in search of gold flecks missed by mechanized processes. In time, artisanal miners expanded over abandoned and informal sites, bought rudimentary equipment, and drew in herders and migrants in search of income.

The vast scale and poor conditions of ninja mining drew government scrutiny and NGO attention to sites in Mongolia such as Uyanga and Zaamar. Dangerous

and deadly work, child labour, use of mercury and harmful chemicals, and undrinkable water for livestock at artisanal sites were matched with polluted water sources, acidification, damaged riverbeds and ecosystems near mine sites, and reduced water access (Gantumur et al. 2017). Here a Sustainable Artisanal Mining project was initiated to license and improve artisanal mining conditions (Munkherdene and Sneath 2018; SDC 2018). Working with local governments, this formalized artisanal mining as a recognized livelihood, established safety standards, and conferred modest health and social benefits. Some progressive companies hired these miners for their local expertise. However, at about 7,000 miners a year, enrolment in the programme has been less than expected (SDC 2018), perhaps because of perceived limited practical benefits, due to regulatory and reporting restrictions imposed upon artisanal miners.

The physical challenges of extraction reconfigure environments near mining. The repercussions are compounded in drylands, as a lost water source or fenced-off pasture affects dominant livestock herding for several kilometres. If available water is contaminated, identifiable even without formal testing by sight, smell, and taste, local residents are unable to water herds and must drive long distances for safe drinking water. Remarkably, camels are able to identify and 'hear' groundwater at locked boreholes that herders are unable to access. Here, pastoralists and large- and small-scale mining compete fiercely for the same minimal water resources with herders least able to afford alternative water supply (e.g. deep boreholes, trucked-in water). As sources are polluted, diverted, or become unproductive, it adds to the litany of community complaints about mining and social conflict, and often to lost livelihoods.

This then raises the issue of migration related to development and mining in Mongolian drylands. One discourse features the mobility and safety net that artisanal mining offers (Bryceson 2018; Munkherdene and Sneath 2018). This posits that small-scale mining offers a potential, though difficult, source of income that keeps residents in the countryside as people move from site to site. By turning a blind eye to the illegality and informality, the process costs the government little and may limit out-migration from drylands to the capital (Munkherdene and Sneath 2018). A more grounded approach identifies reduced livelihood opportunities due to mining combined with increased climate variability, which drive locals from the land and out of herding, often to become unskilled workers in urban shantytowns. The key point is that long-serving rural practice—pastoralism sustaining small communities—is transitioning to a mixed industrial/artisanal mining and herding model for sustenance, with resulting dramatic movement towards towns and the capital as the final locus, after disappointing rural livelihoods.

Similar to Niger and the Sahel context, large-scale mining reorients customary local practice and livelihoods. Company mines provide low-skilled employment for some, yet pastoral work supports more families. As mine license areas (extending up to 80 sq km) displace herders, communal customary land tenure and family pasture rights lead to conflict, especially over access to water. Artisanal mining is impossible in the vicinity of large mines; locals are known to travel far afield when new small-scale discoveries are made. While there may be protests locally and in

the capital, there are no disruptive non-state actors. Here, legitimate enterprises, usually Mongolian, Chinese, and Russian companies, exploit minerals for export to neighbouring China. The process of acquiring licenses and export permits has led to elite capture and rocketing corruption levels. The (in)famous case of Oyu Tolgoi (owned by Rio Tinto) is now known more positively as a case where 'Mongolian herders […] took on a corporate behemoth—and won' (Sternberg et al. 2020: 536). The mediated community settlement represents constructive engagement between a mine and pastoralists, made possible by an open, democratic society and a company's interest in corporate responsibility. Though the mine and government are currently in contract renegotiation, common in Mongolia, on this matter there was no interference (or attention) from the government. The long mediation reflected the contentious livelihood challenges and development process.

Summary

The open cut recognizes the challenges and contestation between mining and development in rural dryland communities. Focused on the Sahel and the Gobi, this chapter has identified how access to common-pool resources, such as pasture and water, may be undermined by powerful actors and states. The conflict may be characterized as being one between pastoralists, agrarians, and communities vs mining, yet it also reflects the struggle between local artisanal and industrial-scale mining. Mobile livelihoods, usufruct rather than legal land rights, and competition for and contamination of resources differentiate stakeholders and reflect power imbalances and threats to livelihoods. Particularly challenging in the Niger uranium case is the intersection of colonial history and postcolonial dismantling of the commons, state insecurity, and the ideoscape of terrorism. In contrast, the Mongolian case reflects an ongoing transition that reflects the co-existence of mining and herding in rural communities.

As marginal environments, drylands are resource-limited in water, vegetation, and ecological productivity. Here altered land use and land cover by extractive industries with state alliances disrupt customary mobile livelihoods and may reduce pasture access, pollute environments, and necessitate resettlement from homelands. Alternative work in mining, out-migration, and new economic activity (perhaps illicit) reflect the resultant waning pastoral viability. Displacement distorts land use and rights, increases competition, and drives overuse of available resources. Extractive benefits accrue to companies and the state yet foster local insecurity, while this is hidden behind discourses of development and sustainability, acting as anti-politics machines (see Ferguson 1994). Added burdens of colonial legacies, power inequities, and violent movements in the Sahel make pastoralism a problematic pursuit, because of the narrative of being a negative and underdeveloped form of resource use that is also linked to overuse and terrorism. The same can be said about artisanal mining, which is often labelled negatively in order to render it illegitimate and a dangerous livelihood. However, local people have their strategies and react to the dominant pressures in their own ways, which may be termed 'weapons of the weak' (see Scott 1985), and the anti-politics

machine in this drama of the grabbed commons can turn into a politics machine (see Niederberger et al. 2016; Gerber and Haller 2020).

In Mongolia, local pastoralists were able to claim their rights based on the recognition of global and national legal standards. On the other hand, cases in Mali and Niger show little prospect of positive engagement or resolution. State and company hegemony, violent state and non-state groups, and a lack of outside support—as well as being labelled negatively (terrorism-scape; see also Chapter 3 on drylands narratives, this volume)—have left pastoralists and artisanal miners with few ways to ameliorate conditions. Global efforts towards responsible mineral supply chains, increased demand for critical minerals, and continued efforts of the Extractive Industries Transparency Initiative (EITI) (joined by Mali, Niger, and Mongolia) bring attention to mining impact on communities. Yet legality, health and safety measures, and human security benchmarks have limited impact as voluntary initiatives and standards, and they may not be adequate to improve precarious living conditions (Calvão et al. 2021; see also critical discussions on CSR in Gerber and Haller 2020). Power asymmetries, historical legacies, weak institutions, and corruption continue to disadvantage pastoralists and their communities. This leads them to pursue their actions differently, from low-level resistance to successful claiming of rights also based on external support.

This chapter has shown how mining changes local livelihoods, dryland landscapes, their cultural environments, and property rights such as access to former pastoral commons. Responses have to deal with imbalances between large mining companies and local actors, including artisanal miners and pastoral lifestyles. Developing feasible processes is essential to mitigate extractive impacts on communities and increase the distribution of extractive rents. Desert marginality is part of the dynamic that mining exacerbates for local inhabitants. As in Chapter 13 (this volume), the current chapter has considered the role of local institutions in regulating access and of resource governance (constitutionality) when approaching the mining sector. Successful engagement in the Mongolian case was possible with cooperative effort and external support, and without the threat of violence. This may be an exception, with the challenges confronted in Niger and Mali more typical of dryland mining conditions. Throughout marginal drylands, limited on-the-ground understanding of reproduced colonial structures and of power inequities suggests that more just and robust institutions and the processes outlined in this volume are fundamental to improving extractive practices and community lives. It also critically questions the role of the global North—especially of European countries with their colonial and postcolonial legacies and their hosting of large mining companies (e.g. by Switzerland) with or without direct colonial pasts.

Note

1 https://www.orano.group/en/news/news-group/2021/march/a-new-stage-commences-for-the-cominak-mine-in-niger;andhttps://www.rfi.fr/en/africa/20210315-niger-uranium-mine-closure-arlit-cominak-hundreds-of-jobs-cut-concerns-for-environment-africa-economy-orano

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7 Mega-infrastructure projects in drylands

From enchantments to disenchantments

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Introduction

In several dryland areas, especially in the Sahel, people have lost their land since colonial times owing to investments and conservation initiatives (see Chapter 5 on large-scale agrarian investments and Chapter 8 on conservation, this volume). With the planning and realization of mega-infrastructure projects (MIPs), local groups are facing an additional threat of losing their land and land-related resources. However, another dynamic of a different magnitude comes into play: wider planning at a national or international scale is leading to an acceleration of the land rush, driven by persuasive developmentalist arguments. In Kenya and Tanzania, as well as in several dryland areas in Central Asia, new territorial designs combine large-scale infrastructure projects for transport, energy, and agricultural production that will connect Africa and Asia with Europe and the Americas on a much larger scale than ever before. Ports, railways, and highways, as well as pipelines, will reduce time and costs for the transportation of goods, people, and energy around the globe. Linked to these are green old and new energy projects (dams for hydropower, large-scale turbines for wind, and large-scale solar installations), new urban centres, and large-scale green mega-agricultural projects with related infrastructure for sustainable food and energy production and greening of landscapes. Significant examples are the Lamu Port, South Sudan, Ethiopia Transport Corridor (LAPSSET) in Kenya; the Southern Agricultural Growth Corridor of Tanzania (SAGCOT) development areas for so-called 'sustainable agriculture production' in Tanzania; the Great Green Wall (GGW) initiative in the Sahel; many new dam projects in drylands; and the Chinese Belt and Road Initiative (BRI) in Central Asia and the Middle East. On the one hand, these plans promise a new level of economic growth and freedom of circulation, said to be in line with the Sustainable Development Goals (SDGs). On the other hand, these mega-plans will lead to an extension of land-rush processes, which outnumber previous land-grabbing operations in terms of scale and size. The increase in the value of the land and resources adjacent to already operative infrastructures, or ones in the planning stages, attracts the interest of powerful economic actors. In

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addition, mega-infrastructures come with technological advancements and new 'green development' promises. This green development package hides the *de facto* exclusion of local land and resources owners without creating substantial alternatives for work and livelihoods. We show in seven cases set in African and Central Asian dryland contexts (the Sahel area, Tanzania, Kenya, Morocco, Turkey, and Pakistan) that local users (mainly pastoralists but also fishermen and farmers) do not have only their lands and resources challenged, but also their ways of life: these dynamics cause local political, social, and economic fragmentation and lead to a kind of rural gentrification (exclusion of rural people from land and resources) and the spread of accumulation by dispossession.

Our view on MIPs

As a starting point to theorize MIPs in dryland areas, we critically engage with the notion of frontiers. Frontiers have been described as spaces where the global capitalist system creates and recreates new waves of expansion and accumulation as new resources are (re-)discovered or invented (Rasmussen and Lund 2018). In this process, local conditions are reshuffled and institutional orders reconfigured. While drylands can be seen as new frontiers of investment and MIPs as constitutive of such a process, we propose to move beyond these insights and take a closer institutional and historical look at the land and resource tenure changes, the implications of frontier making for dryland populations, and the differentiated process of attraction of the development discourse that underlies MIPs.

MIPs play a double role in frontier processes. On the one hand, mega-infrastructure investors may be drawn to new areas because resources have been assigned new value owing to changes in relative prices (e.g. wind in northern Kenya; see later in this chapter). On the other hand, infrastructural projects may function as catalysts for new frontiers (e.g. Pacheco 2005), as they make previously inaccessible land and resources accessible and interesting for investment and increase the value of land and land-related resources for other actors. MIPs unfold in areas with a longer history of state building and *de facto* grabbing of land and common-pool resources previously under communal rights, even before the emergence of frontier processes. Frontier-making processes thus do not simply 'reshuffle' local conditions and institutions but, from the point of view of dryland populations, *add* new challenges of legal pluralism to their land and resources and increase the options for institution shopping (Haller 2019).[1]

MIPs may lead to 'enchantment' because of the promise of fast transportation, better connectivity between urban and rural areas, and new jobs (Harvey and Knox 2012). At the same time, MIPs act as a 'desiring machine', especially for development (de Vries 2007). For drylands specifically, MIPs' enchantment and desiring machine promise to reduce space in difficult terrain via velocity and connectivity, open up the possibility to explore new resources through the use of new technologies, and render viable what initially looks very unviable. But what happens if these desires and promises are not fulfilled because the more powerful

state and company actors do not behave as planned? Aside from the fact that anticipated benefits at the local level often fail to emerge, previous resource use systems also come under severe stress because MIPs facilitate commons grabbing and restrict access to resources in drylands. Thus, MIPs may also turn out not to be desiring machines. In fact, they may rather be seen as what Ferguson (1994) has called an 'anti-politics machine' when he referred to state-enforced development projects as hiding the local power relations that had created the development problems that those projects intended to solve in the first place. MIPs are thus installed with the promise of local development, yet local land and resources are removed without offering real tangible alternatives to most local groups, as these groups do not have the power to define what development means and how costs and benefits should be distributed.

We therefore ask: what is planned and by whom; how is it implemented; and how is it legitimized? Furthermore, we are interested in understanding by whom and based on which interests MIPs are set in motion, how do they change local power constellations regarding land tenure institutions (rules) of use, access and ownership, and visions for development, and how all this is legitimated. Such an analysis also looks at how perceived and real benefits and costs are distributed (impact assessments) and how this leads to differentiated reactions by the actors involved and affected. MIPs often lead to large contrasts between an enchantment discourse and a subsequent disenchantment process when mobility for all, jobs, and connectivity do not materialize, while local resources and land are lost. If local bargaining power is rather weak, subtle local resistance reactions—Scott's (1985) 'weapons of the weak'—may manifest. But if local bargaining power increases, a process of dismantling the anti-politics machine and a disenchantment process over time may lead to open resistance and to what could be called 'politics machines'. We also argue that this is linked to the overall labelling of people in drylands as 'marginal', especially in dryland areas perceived as idle, unused lands. This view enables the argument that MIPs bring development to these 'wastelands', while making it easier to depict dryland populations as a hindrance to the progress that agricultural, infrastructural, and green energy development brings—while simultaneously denying these populations' tenure of land and resources. In addition, in these cases that we have selected, governments and investors label MIPs as a form of 'green development', and this labelling provides options for a selection of institutions (rules) in an institutional plural setting: governments and investors are able to legitimize MIPs by linking them to the SDGs and Agenda 2030, as well as to green international development programmes (of the EU, World Bank, and others) that demand they implement green policies (Larsen et al. 2022). In this way, institution shopping is possible and legitimates these organizations' interests with the help of green discourses that legitimate investments. At the same time, this legitimacy acts as an anti-politics machine of green development that hides power asymmetries between governments and investors on the one side and local communities on the other behind green ideologies.

Our present view on dryland MIPs, therefore, benefits from insights from four strands of scholarship:

- New institutionalism as power-sensitive rule-making (North 1990)
- Critical political ecology of development—that is, the political economy of environmental change and dispossession (Bryant and Bailey 1997)
- Lacanian perspectives of desire and enchantment in development (e.g. Lennon 2010)
- Foucauldian accounts of depoliticization in development (Ferguson 1994).

Our view captures MIPs as 'machines': desiring machines, anti-politics machines, fundraising and consensus-building machines (see the case of the GGW below), and politics machines. Indeed, the metaphor of 'machine' lends itself well to the description of the development 'apparatus' (Foucault 1994; Agamben 2009), both in describing the characteristics of development and in showing how it works. MIPs share all these elements: they are hybrids of knowledge, techniques, and objects (Latour 1991); they are complex—they have many components and many cogs that can jam; they require massive infrastructural interventions (Gellert and Lynch 2003); they want to move the future of the intervention area in directions other than the current trajectories (Bauman 2002). 'Skilled drivers' are therefore needed to manoeuvre these machines. MIPs deceive and mislead, seduce and betray: they envisage the escape from a gloomy destiny of backwardness and conceal that the lands they cross contain common-pool resources, knowledge, and cultures; and they use many means to persuade (compensation, new infrastructures, and new services—and perhaps corruption) and then often leave little on the ground, which mostly ends up in the hands of the elites. They activate and move flows of people, goods, water, and energy. In the drylands, machines advance over land that is considered 'empty' and 'useless'; they do not ask for permission, except formally, and they flatten what they encounter (Haller 2019). In fact, as they advance, they tear up a delicate web of relationships between actors, resources, and spaces. They become traps that capture resources, people, and knowledge (Bertoncin and Pase 2017), reducing resilience to accelerated environmental and anthropogenic transformations (Eriksen 2016; Haller et al. 2020). These machines rarely deliver on their promises, and enchantment can quickly turn into disenchantment. Disappointment is often proportional to the expectation that had been created.

This chapter looks at the various ways in which MIPs are planned and set up in drylands and the local reactions in response to these initiatives. The next section presents MIP cases related to agriculture and forestry: the GGW in the Sahel (an infrastructure of trees, a 'wall' of trees) and the SAGCOT corridor in Tanzania. The subsequent section presents cases related to transport and mobility: LAPSSET in Kenya and the China–Pakistan Economic Corridor (CPEC) in Pakistan. Then in the next section, the focus will be on energy infrastructure as a basis for further MIP development: The Turkish Southeast Anatolia Project (Guneydogu Anatolia Projesi, GAP) project, the Noor Solar Energy Project in Morocco, and the Lake Turkana Wind Power (LTWP) project in Kenya. The conclusion will pick up again on the new capitalist frontier discussion and provide a constructivist (enchantment, desiring) and a structural power-specific institutional analysis.

MIPs in agriculture and forestry: dryland imaginaries and realities

The Great Green Wall in the Sahel[2]

'There have been ups and downs but the Great Green Wall is part of the solutions to provide a sustainable future for the populations of the Sahel', said Emmanuel Macron on 11 January 2021, on the occasion of the One Planet Summit conference organized by France, the United Nations, and the World Bank in Paris (Le Monde, 12 January 2021). The idea of the GGW was first launched in 2005 by three African heads of state (O. Obasanjo from Nigeria, A. Wade from Senegal, and M. al-Qaddhafi from Libya) and approved by the African Union in 2007. The initial idea was to reforest a belt of 7,000 km long and 15 km wide, from Senegal in Western Africa to Djibouti in the Horn of Africa in the east of the continent, which has isohyets of between 100 and 400 mm rain per year. The 'wall' was to stop the 'advance' of the desert, which, according to a narrative initiated or at least reinforced by the great Sahelian droughts of the 1970s and 1980s, risked submerging the adjoining regions of the Sahara (Morel 2006; Cherlet et al. 2018). The plant barrier was to stop this 'conquest'. The Sahelian countries promoting the GGW wanted to seize a new opportunity to 'design development' (and, above all, guide it) in alignment with the new dictates of environmental sustainability, after the long decades of structural adjustment and related withdrawal of the state (Mugéle 2018). The image of the 'green wall' has had a great evocative power, effectively mobilizing and rallying donor countries and large international institutions for support. This is an image linked to other reforestation projects, such as those attempted in Algeria in the 1970s (Green Dam), the green belts around Niamey in Niger and Nouakchott in Mauritania, or President Thomas Sankara's dream of the 'three struggles' against '*feux de brousse*' (bush fires), deforestation and desertification in Burkina Faso (Goffner et al. 2019).

In the press, the GGW has often been described as 'pharaonic'. Indeed, this is a massive project that, although using mass reforestation rather than physical infrastructures, intends to bring improvements to an area of enormous extension, with impressive objectives ('100 million hectares of land restored, 250 million tons of carbon sequestered and 10 million jobs created') by 2030 (United Nations 2020).

The GGW fits into a larger history of dreamlike projects for the desert and the neighbouring regions since the colonial age (Henry et al. 2011). E. Roudaire, a French military engineer, in the second half of the 19th century proposed to create a sea inside the Sahara Desert, by digging a channel of 240 km that would bring the waters of the Mediterranean to flood the depressions between Tunisia and Algeria (Roudaire 1874). This new sea would change the climate of the region, bringing humidity and rain to the heart of the desert. At the end of the 20th century, it was proposed to construct a system of dams, pumping, pipelines, and canals capable of transferring water from the Congo Basin to the Chadian Basin, and there is still talk of it. The declared aim was to 'save' the 'disappearing' Lake Chad and thus to prevent its devastating effects on the populations of the region (Bertoncin and Pase 2012). This very expensive project, with a potentially

high environmental impact, fails to take into account the high variability of the lake, whose waters have in more recent decades returned to growth, following the drastic reduction during the great Sahelian droughts (Magrin and Mugelé 2020).

In reality, the results of the GGW have been disappointing. The UN 2020 report declares that after 15 years only 4 million ha of land are under restoration in the intervention zones rather than the 100 million targeted. Only Senegal has demonstrated continuous commitment to the project, so much so that we can perhaps speak of '*Grande muraille sénégalaise*' (Great Wall of Senegal) (Magrin and Mugelé 2020). Many of the other countries have in the meantime been affected by disruptive political instability and social violence: this is the case for the Lake Chad region with Boko Haram and other radical Islamist organizations, the civil war in Mali, and the violence affecting the area of the three borders separating Mali, Niger, and Burkina Faso, partly a result of the wave of regional destabilization linked to the fall of the al-Qaddhafi regime in Libya (2011). Western intervention, in particular by French with the Barkhane operation (an ongoing anti-insurgent campaign started in 2014 against Islamist groups in the Sahel), struggles to help the governments involved. In the background, there is the European fear of more and more migrants crossing the desert and the Mediterranean Sea on fragile boats. The reaction has been to try to 'relocate' the border of 'Fortress Europe' to the Sahel. Here is where the GGW is given a second chance.

In the meantime, however, the GGW has changed its objectives and methods of implementation:

> instead of a 'wall of trees', it is now conceived as a mosaic, comprised of diverse, landscape-scale actions that are designed to provide long-term solutions for improving environmental and socio-economic conditions in the zone.
>
> (Goffner et al. 2019)

Each state chooses where and how to act within the general framework of the GGW, often understood as a 'fundraising and consensus-building machine'. If to 'enhance resilience in Sahelian landscapes and livelihoods' could be the new redefinition of the GGW goal, one wonders whether what it will consolidate will rather be the resilience of 'big projects' and the state elites who control them.

The SAGCOT Corridor in Tanzania[3]

The SAGCOT Corridor is a large-scale agricultural development and green MIP that covers an area of 350,000 ha, ranging from 150 km north and south of the capital of Dar es Salaam in the east, up to an area west of Lake Tanganyika in the north, and Lake Malawi in the south (Sulle 2020). SAGCOT is full of enchantment promises (economic development, opportunity, jobs, connectivity, prosperity, farming techniques, etc.) propagated by state and international actors as well as by private donors and business actors. Initially following a socialist approach to agricultural policy after independence, Tanzania's agricultural sector later moved

in the opposite direction, enabling the introduction of a large number of public–private investment partnerships since the 2000s.

The SAGCOT Corridor encompasses roads, railways, factories, warehouses, storage facilities, research hubs, water and energy supplies, and so on. This infrastructure lies in a multi-sectoral region called area (or cluster) that includes the establishment of commercial relationships between companies, smallholders, outgrowers, and other organizations. The economic development discourse underlying SAGCOT claims that local producers and their products will be connected via roads and railways to transport nodes, warehouses, farm blocks, markets, power plants, and international export channels. Contrary to these visions of development and connectivity, an international debate has recently evolved highlighting the dispossession and the undermining of fragile local communal resources and land rights by SAGCOT via the option of its formalized land-use planning (e.g. defining sections for agriculture, forestry, and conservation) (see Bergius et al. 2018; Bluwstein et al. 2018). Two processes have been identified leading to this situation: (a) all land and resources were consolidated under the ownership of the state (under control of the president; see Gmür 2020); and (b) land-use planning strategies made commons of local villages (pastures, forests) available for development projects and thus opened them up for grabbing by the state and other investors (see Bluwstein et al. 2018). These processes have undermined locally established resource management and coordination institutions between farmers and pastoralists and fuel conflicts between them (e.g. Maganga et al. 2016; Bergius et al. 2020). Furthermore, SAGCOT acts as a multi-sited 'broker and catalyst'[4] of numerous development programmes supported by the SDG-related discourse of resilient and sustainable development, and the enchantment of green modernization mainly by agrarian investors such as international agro-chemical European companies. It even has the potential for attracting donors such as pension funds to replace or complement state and international organizations (e.g. the World Bank), both of which eventually withdrew from funding the MIP (see Bergius and Buseth 2019). Such actions are based on the '*Agriculture First*' (Kilimo Kwanza) strategy advancing various other national programmes and other initiatives (e.g. 'Vision 2025'). In these, the World Bank, FAO, and governments of the G8 countries (including USAID, UKAID, and the Norwegian embassy as funders)[5] and 122 private sector companies, commercial banks, (inter)national development, and in collaboration with farmer and government organizations, publicly joined as partners with the discourse to fight poverty and the food price crisis after 2008. However, research on specific investments shows that not only local land is grabbed but also land-related common-pool resources, which undermines local livelihoods and increases the pressure on marginal areas, while at the same time undermining local mobility and resilience in these drylands. In addition, large-scale plantations have led to chemical pollution (Gmür 2019).

Despite the option in Tanzania's constitution that local communities can be given common property (see Gmür 2020), SAGCOT led to processes of local common-property institutions being 'legislated out of existence'. This especially

disregards local religious views of the land and land-related resources as being in spiritual resource ownership and as depending on ritual activities important for coordination of resource governance. Furthermore, legal pluralism in Tanzania—for example, different legislations for different common-pool resources—allows for 'territorialization from above' (Bluwstein and Lund 2018; Bösch et al. forthcoming) by demarcating, for example, forests, pastures, areas for conservation, and investments. This allows the state to take hold of village land (Bluwstein et al. 2018) by institution shopping (Haller 2019).

Local reactions, however, are mixed and not always so visible. In some villages, district lawyers have filed complaints against the investors at local and national courts. However, the negotiations ended in favour of the investor, which further deepened the villagers' distrust of state authorities (see Bösch et al. forthcoming).

MIPs of transport and mobility

Less visible but not less impactful are MIPs related to roads and mobility of goods, because transport facilities have the power to change the value of land and other resources; they not only make mobility faster for certain actors but may also increase the value of land adjacent to the road network and connected destinations.

The LAPSSET Corridor in Kenya[6]

The LAPSSET Corridor represents a large-scale transport project connecting Kenya with neighbouring countries South Sudan, Ethiopia, and Uganda, through a network of railways, oil pipelines, highways, resort cities, and especially a massive enlargement of the port in Lamu. Whereas most components of the project are yet to be constructed, some are already complete or at an advanced stage, such as the Isiolo Airport, the Isiolo–Marsabit Road, and the first berths of the Lamu Port. In addition to participating states, there are a number of key global investors from all over the world, including China—and among them oil companies. The interesting ideological aspect of this mega-project seems to be reflected in the strategy of the participating governments (especially of Kenya) to label LAPSSET as a great financial and sustainable development initiative, making clear reference to the SDGs and the Agenda 2030.

The LAPSSET Corridor will traverse seven counties mainly in the north of Kenya, where a large proportion of the population are nomadic and transhumant pastoralists, such as the Turkana, Somali, and Samburu, whose land ownership was in precolonial times organized along the lines of ethnic and subgroup common-property territories, regulated by common-property institutions that govern mobility, access to dry season pasture, rules of sharing cattle, and so on (McCabe 1990). In the Lamu Port area, communities such as Baju groups depend on fisheries as a common-pool resource owned in common property. Depending on the season, the high sea is inaccessible for fishing and then people use areas close to mangrove forests and coral reefs, which are also managed as commons. There are channels in which catching lobster, shrimp, prawns, eels, mullet, and so

on is possible; a set of informal rules regulates the use of technologies, and some areas are seasonally closed for regeneration purposes.

Generally, communal fisheries and pasture rights have been undermined by state property and state regulations. These today define new ownership rules that land and related pastures are held in trust by the government and districts, and fisheries are the property of the state, which also defines closed seasons, landing rights, and size restrictions on nets. Werthmüller's (2020) anthropological research on the local impact of the Lamu Port reveals that the first working phase already destroyed the most vital commons for the Lamu communities, such as fishery areas in the reefs and the mangrove forests. Furthermore, there is heavy water pollution from the project, leading to the destruction of fishing grounds and a reduction in the previous gains from tourism. Werthmüller (2020) also shows that what has been described as a 'desiring machine' for development turns into a false promise, as the state cannot compensate for the described losses. As a local reaction, an NGO 'Save Lamu' was established by local actors, which is trying to inform people about LAPSSET activities and organizes collective actions in order to reduce ecological destruction and avail of compensation claims via legal steps. In a similar way, Turkana groups further north fear the impact of the oil industry, and local community members together with a number of civil society organizations have highlighted both the real and anticipated effects of the projects: disposal of hazardous waste, cutting down of trees, loss of grazing plains, blockage of migratory corridors, and pollution of water. Furthermore, road and oil pipeline construction activities for the LAPSSET projects in Turkana have not yet started, while ongoing attempts to acquire land for the project in the region have led to considerable concern among many Turkana regarding their land rights, increased land speculation, poor compensation for land, and reduction of mobility patterns—the railway, pipeline, and road networks cut through many communal pasture areas and transhumance routes (Werthmüller 2020; Kalika and Schubiger forthcoming). While conservation organizations can voice and address their concerns, pastoralists cannot (see Enns 2019; Enns and Bersaglio 2020). The LAPSSET Corridor has also set its sights beyond Africa, aiming for global connectivity through China's BRI, although this is not always visible (see Anthony 2020).

The CPEC in Pakistan[7]

CPEC is the flagship project for the new Chinese vision of its BRI (Shah 2018) and exhibits problematic issues similar to those of the LAPSSET Corridor. The various stakeholders in CPEC have deployed at least 62 billion USD for a quick realization of this vision (Casarini 2016; Kanwal et al. 2019). This incredible amount of resources indicates the importance given to this ambitious undertaking by both China and Pakistan. The Pakistani province of Balochistan is home to the first completed element of CPEC, the Gwadar Port. Alleged benefits of the project are tirelessly advocated by both Chinese and Pakistani officials, who say that the benefits of CPEC will be transferred to the local Pakistani communities

based on development promises (Kanwal et al. 2019). This 'enchantment' around positive development seems to be following the usual narrative of MIPs. BRI and CPEC are framed as inclusive win–win projects (Arase 2015), but how the local population will profit and how the benefits will be shared inside Pakistan remains largely unclear, while the impacts do not seem too promising for the local subsistence-oriented population. The nomadic pastoralists and fishery groups on the coastline of the Arabian Sea, who collectively own land and water resources under common-property institutions regulating access to these resources, are under pressure by elites of an authoritarian state who welcome the MIP.

CPEC was first announced during President Xi Jinping's state visit to Islamabad in April 2015 and is China's largest overseas investment project to date. It consists of extensive investments in Pakistan's transport, telecommunications, and energy infrastructure, which eventually will link the port of Gwadar in Balochistan Province to the city of Kashgar in China's Xinjiang Province (Casarini 2016). It parallels the existing Karakorum Highway, which today connects China, through Pakistan, to the Arabian Sea (Arase 2015). The benefits of CPEC are said to include a better standard of living, a better income, millions of new jobs, business promotion and opportunity, a better quality of education, and better connectivity for the rural communities to the large cities (Kanwal et al. 2019). This official discourse neglects the ethnic tensions: Baluchis fear that central Pakistani groups will use CPEC to outnumber them and attract only foreign investors (Kanwal et al. 2019). The already constructed port of Gwadar illustrates that while it is becoming a modern trade and tourist hub like Shenzhen or Dubai, Baloch fishermen have been evicted from the port and excluded from their common-pool resources, without being provided other livelihood options in return. The same is true for the various local nomadic groups, whose transhumance patterns will be destroyed.

However, the issue of losing access to the commons is not the only critical one. Local groups who are not enchanted by the MIP development promises are under strong pressure and are characterized as anti-CPEC insurgents or even terrorists. Local political parties reported human rights violations to the Human Rights Council in Geneva, and a UN Special Rapporteur for Pakistan was requested. Unfortunately, there is very little research regarding the human rights situation in the area. What is clear is that CPEC not only concerns new infrastructure but also will provide easy access to mining of the rich deposits of limestone, granite, marble, sandstone, gold, copper, iron, chromium, barium, magnesium, aluminium, and onyx for China (Farooqui and Aftab 2018).

Energy infrastructure as a basis for MIP development

MIPs in transport and mobility tend to stimulate the exploitation of minerals and other resources, which is also reflected in the rising demand for several forms of energy generation. These can range from dam construction to other renewable energies, such as wind and solar. We will describe three cases, one each of these energy-providing techniques, in MIPs and their impact on drylands.

The GAP project in Turkey[8]

Since its start in the 1970s, the GAP project has evolved from a hydraulic project into a transformative regional development programme for Turkey's south-east. Still centred on 22 dam projects and 19 hydropower stations for food and energy production, it became a multi-sectoral $32-billion investment, including road infrastructure projects for education, women's empowerment, entrepreneurship, and settlement of nomads. The MIP became the 'primary way of delivering government services to the region' (Oguz 2021).

Turkey took great pains promoting the project as a nation-building and peacemaking effort, with international dividends such as downstream flood control—utilizing plentiful water to overcome class differences and cement national integration—as well as eroding the base of the Marxist-Leninist Kurdish Workers Party (Partiya Karkeren Kurdistane, PKK). Curbing Kurdish secessionism served the goal of safeguarding territorial integrity, while elevating the region from backwardness was intended to undercut their support base (Warner 2008).

Many in this predominantly Kurdish- and Arab-speaking area see the programme as Turkish state extension into the hinterland (Bilgen 2019; Akinci et al. 2020), trying to push the unifying Turkish hydraulic development imaginary. This attempted to oppose local and international NGOs presenting an idealized picture of the mountainous region as an age-old crossroads of nomadic civilizations and of Kurdish self-perception as the heart of the Middle East they long for.

In 1984, attacks on engineers and structures involved in building the Ataturk Dam, GAP's physical and symbolic centrepiece, established the PKK on the map as the militant voice of Kurdish identity. PKK has continued to focus on dam projects, including targeting cement trucks and power lines for the GAP's closing piece, the Ilisu Dam. This brought a security rationale into the development discourse (Warner 2008). The dams, then, also came to serve a strategic defence purpose, cutting off the 'routes PKK used' and obliging travellers to take 'military-run ferries across dam lakes' (Oguz 2021).

The enormous Ilisu Reservoir on the Tigris floods an area the size of Malta, 313 sq km in area, and according to the amended Resettlement Action Plan of 2006, it would displace some 61,000 people in 199 settlements in and around the town of Hasankeyf—a global heritage site where not only Kurds but also Armenians, Arameans, and Arabs live—and cut the transhumance routes of ten nomadic tribes. Designated resettlement areas seem poorly suited for agriculture (Oguz 2021). But the flooding of Hasankeyf also meant the destruction of historical caves and canyons that could serve as terrorist shelters. In a region so full of history that it is called 'an open-air museum' (Minister of Culture, cited in Shoup 2006), political leaders and water managers, however, found it difficult to understand why this was such an issue and gave little time and budget to excavations. The caves, nevertheless, became symbolic of cultural dispossession of the south-east region by the state's unstoppable MIP and thus also touch on core issues of identity to serve as a source of mobilization against the dam.

The Noor Solar Energy Project in Morocco[9]

The question of local identity, which is contrasted to a MIP solar project as a form of green modernity, is also an issue in one of the world's largest solar energy projects in Morocco, the 'Noor Ouarzazate' (the light of Ouarzazate) (Figure 7.1). This project can also be seen as an example of how a state uses green energy MIPs to extend its control over an area labelled as being 'a wasteland'. The project, covering an area of 3,000 ha, is led by King Mohammed of Morocco and operated by the parastatal company Moroccan Agency for Sustainable Energy (MASEN), which involves considerable EU technological investments, mainly from Germany. It is situated in the arid and semi-arid Anti-Atlas area, containing lowlands and several rivers important for water use. The land and land-related commons were a former common property of the Berber sub-clan Aït Ougrour (belonging to the Imghrane clan), with wet season pastures and veld products such as different plants used for animal fodder. These common-pool pastoral resources were vital for marginal groups and women, as well as for herders from neighbouring communities. Councils of elders rule in the local villages, and reciprocal arrangements of resource use with neighbouring herders are part of the institutional design.

Before European control, the monarchy of Morocco exerted little control over the Anti-Atlas area. Since colonial times the area has experienced several land investments, such as the construction of dams. In addition, French colonial

Figure 7.1 Solar panels on common land by the Solar Project Noor II in Ouarzazate, Morocco. Photo was taken by Tobias Haller in 2014.

authorities, and later also the king, attempted to introduce infrastructure and acquire control over this area by establishing a state administration of different levels (from sub-areas down to the village level). The solar energy investment is thus not the first state-driven project in the area. What is new, however, is that the area is labelled as 'wasteland', justifying the extremely low payments for the loss of the commons. The state's energy company Office National de l'Electricité et de l'Eau Potable (ONEE) expropriated the common land of five local groups and then transferred the land to MASEN because land in common property cannot be sold directly. The five village communities, represented by their leaders, were invited to sign the contract. The price was fixed by the state's arguing that it was a fair price for a desert 'wasteland'. In addition, the state and MASEN legitimated their investment by using a green development discourse: this sustainable energy project will bring development to a marginal area (jobs, activities in cooperatives, sanitation, alphabetization campaigns, and new infrastructure), generating also a positive gendered outcome.

A set of projects emerged from the land sale proceeds, which did not go to the communities but was paid to a state-controlled fund managed by the Directorate of Rural Affairs (DAR). Communities were told that they could submit projects to the DAR, which would then be assessed and potentially financed. In addition, MASEN set up a series of very different projects based on its Corporate Social Responsibility (CSR) policies. These include, among other projects, the provision of mobile sanitary infrastructure (e.g. a mobile hospital stationed for two days once a year in the principal village Ghessate), school buses, girls' dormitories, stables for sheep and goats, courses in aluminium welding, sponsorship of a local marathon, holiday trips for children, and funds allocated to NGOs focussing on rural agricultural development.

Several problematic issues arise from this gendered and green development discourse and the poverty alleviation narrative. First, the area is not a 'wasteland' but provides pastures as well as fodder for goats owned by women, who earned cash in this way, and it was used seasonally by neighbouring pastoral groups. Second, the price of the land was unilaterally decided by the state and could not be negotiated, and many were excluded from the deal. Third, the projects that could be proposed by local communities in order to be financed by the funds from the compensation payments did not materialize: when local people demanded their projects, they were told that funding was no longer available. Fourth, the project led to commons grabbing, strongly impacting local women's livelihoods and with no tangible compensation, while CSR projects from the company do not provide the promised direct benefits and are not accessible to all people in the area (Ryser 2019).

Generally, the process is perceived as unfair by local actors (with the exception of the elites), who realize that they have lost the commons, which is now fenced and no longer available, reducing their resilience. Because it is a project involving the king, there is not much resistance at the moment; however, local actors clearly state that for them the project did not create gains but rather a loss of the commons (Ryser 2019).

The Lake Turkana Wind Power project in Kenya[10]

The LTWP project shows similar features to those of the Noor Solar Energy Project. The wind power station is located close to Loiyangalani, a small town that serves as an economic hub to the surrounding population and as a tourist stopover on the shores of Lake Turkana. With 365 wind turbines—covering 162 sq km of land, with an extra 1,100 sq km of land retained as a buffer zone around the turbines—300 km of paved roads, and 428 km of electric cables from the power station to Suswa in the south of the country, where power is fed into the national grid, LTWP is one of the largest MIPs in the form of a wind park in Africa. LTWP is located in a remote area of northern Kenya inhabited mainly by Turkana, Samburu, and Rendille pastoralists. The three groups practise different levels of nomadism and semi-nomadism on their commons, herding camels and goats as their primary source of livelihood (Fratkin 2001).

LTWP is part of Kenya's commitment to change its energy mix and decarbonize the national energy sector by adding 310 megawatts to Kenya's national electric system, hence aligning Kenya's development discourse with that of international SDGs. In 2009, the land for the wind farm was leased by LTWP for 33 years with a renewable option of 99 years. With an overall investment of 76 billion Kenyan shilling (equivalent to 623 million Euro, 865 million US dollars), it is among the most significant private international investments in Kenya.[11]

Locating LTWP in a remote dryland area populated by pastoral communities raises questions about local benefits, compared with the cost of losing communal pastures and other common-pool resources and assets. The village of Sirima can serve as an illustration of the zero gain from the eviction process. Inhabited by Turkana people on former so-called trust land, the village would supposedly have 'become congested with traffic, construction activities and associated dust, noise, health and safety impacts', as the Environmental Impact Assessment stated, and thus it had to be relocated without its local people being asked for their opinion (Cormack 2019).

Community discussions, which were part of a so-called public participation process that was not perceived as such by local actors (see Achiba 2019), ended with recommendations regarding employment, welfare services (health, education, water), and individual and communal compensation. The Full Resettlement report stated that there were no land tenure issues at stake by the relocation. An impact assessment report from 2009 noted some potentially negative impacts on 'cultural contamination' of the local population (Njoroge 2010). But none of the mentioned impacts concern cultural heritage, livelihood, or communal land rights; on the contrary, the Environmental and Social Management System (ESMS) argued that a good agreement had been reached with the local communities and 'finally satisfactory agreements were reached with all affected households' (European Investment Bank (EIB) 2020: 3).

The Sirima village relocation plan, although accompanied by CSR policies and compensation mechanisms, assessment reports, and other monitoring activities, exhibits several flaws. First, local pastoralists' rights—which should have formed

the basis for their ability to decide on the location of the wind farm on communal land—were not recognized.[12] Second, development promises were made on the basis of CSR projects, which are either unfulfilled or are not developed in a participatory manner, and most of these projects are rather narrow-scale initiatives. Winds of Change is an NGO established by the consortium to execute CSR. It acts as a 'green-washing of dispossession' (Achiba 2019). Third, the project led to social unrest and contestations over land rights, as well cleavages within and between local communities over compensations and over notions of development that can potentially take on an ethnic dimension (ibid.). Securing some gains for themselves, elites often follow the project discourse that idle or unutilized land is now put to green use, but this discourse neglects to mention that evictions from pastoral areas take place and that pastoral culture and adaptation are undermined. Fourth, there was considerable lack of community consultation. Last, but not least, the wind farm also led to environmental changes, due to changing micro-habitats via the wind turbines decreasing the potential for future innovative husbandry (ibid.), which is likely to affect future adaptation strategies among the pastoralists of the area.

Conclusions

Despite obvious differences in the nature of the MIPs (agro-industrial visions, transportation facilities, and energy), the various cases of MIPs in drylands show striking similarities. The places where MIPs are rolled out are not just frontier areas at the edge of neoliberal change. The issue is rather that all these investments propose a betterment, adding utility to what was considered useless or not well used in the past (see Chapter 3 on dryland narratives, this volume). It is not that frontier areas reshuffle local contexts but rather that the new developments are based on several forms of anti-politics machines of development, hiding power constellations of commons grabbing and putting areas under new postcolonial state and company power. As most of the cases show, it is the desire of state elites to place the negatively labelled 'idle' land or 'wasteland' areas under state control, with the help of the private sector. Thus, in many cases, agro-industrial endeavours, as well as transportation and energy production, are considered to be more important than local common-property institutions of land and land-related resources. But in drylands, these local communal tenure systems provide flexibility, mobility, and resilience, and they maintain cultural landscapes (Haller et al. 2020). This resilience capacity is further undermined with a technological and territorial 'new fix' by providing a desiring machine of MIPs. However, while this desiring machine is pushed by governments and companies (e.g. through CSR projects), the machine is not shared by most of the local inhabitants. The former are trying to adopt modernity discourses so that they can be included in the new wealth-generating distribution process, while the latter—mostly pastoralists and, in two cases, fishing communities—lose out in the process of this new development, which in addition often leads to conflicts. In order to further legitimize these MIPs, governments and companies add a new green layer of discourse in the

process of legitimacy production. From the greening of the Sahel to sustainable or conservation agriculture in the SACGOT Corridor, to the SDG-related LAPSSET Corridor in Kenya and the green energy production projects of solar and wind energy, the legitimacy of the new wave of MIPs addresses global sustainability concerns. Using this discourse, funding and international acceptance can be tapped. The second strategy of states consists in criminalizing inhabitants of the drylands and in this way legitimating military control and the implementation of MIPs (e.g. the Turkey and Pakistan cases).

The overview of the case studies (Table 7.1) indicates that in most instances local common-property institutions are not at all recognized. Second, there is a modernity discourse in combination with sustainability, a discourse that is used to label local people in a negative way (e.g. narratives of 'backward groups'; see Chapter 3 on dryland narratives, this volume). The MIPs pushed by state and companies offer desiring machines to render these MIPs legitimate for the states in an international context. In addition, development is boosted by green projects, which add legitimacy in five out of seven cases, while calling on CSR in four of the seven cases discussed in this chapter. We argue that the green and CSR discourses render the MIPs even more legitimate, while still concealing underlying grabbing processes, pollution, and the exclusion of local actors from their

Table 7.1 Comparison of MIPs in drylands

Comparative theoretical topics/case studies	*State's undermining commons of labelled 'backward groups'*	*State's use of idle land with desiring machines*	*Extension of state control*	*Green anti-politics machines (SDGs)*	*CSR as green grab washing*	*Local disenchantment and conflicts*
The Great Green Wall in the Sahel	Yes	Yes	Yes	Yes	No	Yes
SAGCOT in Tanzania	Yes	Yes	Yes	Yes	No	Yes
LAPSSET in Kenya	Yes	Yes	Yes	Yes	Yes	Yes
CPEC in Pakistan	Yes	Yes	Yes	No	No	Yes
GAP project in Turkey	Yes	Yes	Yes	No	No	Yes
Noor *Solar Energy Project in Morocco*	Yes	Yes	Yes	Yes	Yes	Yes
Lake Turkana Wind Power in Kenya	Yes	Yes	Yes	Yes	Yes	Yes

commons in most cases. Furthermore, the case studies show that although most of the local previous commoners are disenchanted, there is a need to unpack the notion of 'the local': In all cases, the 'local' level consists of a mixed and heterogeneous group of people, with differences existing mainly between elites and non-elite commoners; and a danger is that cleavages between these people can be exacerbated by MIPs and may also take on an ethnic or religious form of mobilization (see Chapter 9 on extremism, this volume).

Notes

1 Institution shopping refers to the strategic selection of rules and regulations, depending on power constellations.
2 Section compiled by Andrea Pase, Marina Bertoncin, and Angela Kronenburg García.
3 Section prepared by Tobias Haller and stemming from Bösch et al. (forthcoming).
4 http://sagcot.co.tz/index.php/who-we-are/ [Accessed 6 May 2020].
5 http://sagcot.co.tz/ [Accessed 6 May 2020].
6 Section prepared by Tobias Haller and stemming from Werthmüller (2020).
7 Section prepared by Tobias Haller and stemming from Forster (forthcoming).
8 Section compiled by Jeroen Warner.
9 Section prepared by Tobias Haller and stemming from Ryser (2019).
10 Section prepared by Nurit Hashimshony-Yaffe.
11 https://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/RAP_summary_Sirima_Village_Lake_Turkana__Wind_Power_Project.pdf [Accessed 15 February 2022].
12 A new court decision (2021) may change this for the future (Hashimshony, pers. com.)

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8 The new green grabbing frontier and participation

Conserving drylands with or without people

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Introduction

Drylands have been affected by so-called green grabbing—that is, the dispossession or displacement of local communities in order to expand areas devoted to conservation, as well as the significant curtailment of access to natural resources by non-displaced groups (Fairhead et al. 2012). Green grabbing can take different forms, such as the removal of people from officially protected areas (PAs), the concession of communal lands to outside investors that will develop conservation-related activities, and the negative side-effects of community conservation (CC) programmes.

Conservation schemes, reinforced by powerful institutional and media discourses that present them as necessary and inevitably beneficial, often contribute to heighten political, economic, and even ecological tensions. Even if framed as being done in co-management and in participation—which is often locally perceived as top-down policy implementation—they add further layers of contention in dryland areas already experiencing land conflicts, and they limit or altogether exclude local populations' access to some areas and related common-pool resources (e.g. pastures, fisheries, wildlife, veld products). Thus, they marginalize or neglect local pre-existing common-property management institutions. In many cases, conservation area expansion includes new forms of commoditization of natural resources (e.g. for tourism) and is part of an ongoing process of increasing state and private sector presence in drylands.

We use the concept of green grabbing, coined in the frame of political ecology analyses, as a way to emphasize the need to use this theoretical framework in order to explore how different actors involved in conservation initiatives interact, what their goals are, and especially how power and socioeconomic differences play out in the development of these initiatives. Dryland populations often belong to groups marginalized in terms of political power or socioeconomic status, a circumstance that may be reinforced by conservation policies. It is also relevant to pay attention to the new common-property management institutions that may appear as part of the conservation programmes, the so-called 'new commons'. In

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addition to intended or unintended economic and environmental impacts, these institutions and local reactions to the new situation can sometimes reframe, at least partially, the results of conservation schemes to the advantage of dryland communities.

The aim of this chapter is to provide a general overview of green grabbing processes in drylands, including examples from different geographical areas such as Sub-Saharan Africa, the Middle East, and Central Asia. This will allow the authors to highlight the most significant global trends and the main impacts on the affected populations, while paying attention to local, specific circumstances and avoiding undue generalizations.

Expanding conservation

Significant areas of the drylands of Central Asia, the Middle East, and particularly Africa have been the site of conservation initiatives, ranging from the establishment of official PAs to the implementation of community-based conservation programmes on communal lands. Especially during the 1980s and 1990s, PAs experienced a remarkable expansion, also in regions where up to then they had covered only small territories, such as in the USSR (and later the newly independent ex-Soviet republics), China, and the Middle East (Brockington et al. 2008: 1–2, 29, 32–33, 38–39).

PAs and area-based 'other effective conservation measures' (OECM) cover 9.6% of the planet. In Africa, they represent slightly more than 14% of the total land area, while in West Asia the PAs cover 3.81%.[1] Some of the countries in the world with higher proportions of their land surface officially protected—and with significant areas in drylands—can be found in Africa: Botswana with 29.14%, Namibia with 37.89%, Tanzania with 38,24%, and Mozambique with 28.88%. In arid or semi-arid West Africa, PAs occupy a somewhat smaller percentage of land, with Burkina Faso 14.89%, Mali 8.23%, Chad 20.97%, Niger 18.2%, and Mauritania an insignificant 0.62%. In this region, political and security problems also imply a lower capacity for law enforcement than in East or Southern Africa. In the Middle East, although Israel has 24.49% of its land under protection, and Egypt 13.14%, many other countries show marginal percentages: Bahrain 6.62%, Jordan 4.47%, Oman 2.57%, and Saudi Arabia 4.76%. A somehow similar pattern emerges in Central Asia, with China protecting 15.62% of its land, Mongolia 19.8%, and Tajikistan 22.28%, but Kazakhstan only 3.31%, Kyrgyzstan 6.71%, and Turkmenistan 3.25%. However, looking at these quantitative data has to be done with some caution, as it is not obvious in all cases whether these are really enforced PAs or so-called paper parks (Di Minin and Toivonen 2015).

The expansion of areas under some sort of conservation status is a trend that seems likely to continue in the future, with recent private and public initiatives setting ever more ambitious territorial goals. The Half-Earth Project, initiated by the E.O. Wilson Biodiversity Foundation, for instance, calls for the protection of 50% of the global surface as a 'solution' to the extinction of species. The project's

priority areas of intervention do not include many drylands, however, only the 'area between Kenya and Tanzania'.[2] The Convention on Biological Diversity is setting a target of 30% of land and sea areas to be officially protected or under OECM by 2030.[3]

This expansive conservation is part of an ongoing pattern of increasing state and private sector presence in drylands, which includes, among other processes, the appropriation of land for commercial agriculture or mineral exploitation.[4] Indeed, drylands can be considered as new frontiers of investment for local and transnational actors, where land and resources previously on the periphery of market economies are now 'open' to commercialization (Igoe et al. 2009; Evers et al. 2013). New forms of commoditization of natural resources such as wildlife and indigenous plants are set in place (Fairhead et al. 2012: 244; Bollig 2016; Bollig and Lesorogol 2016).

These trends can be detected in many regions in the world, but they have a specific character in dryland areas. Drylands are affected by severe climatic variations between and within seasons, and the real or alleged impact of climate change on them is sometimes used as proof that conservation would be a better land-use option. They often are or have been economically peripheral in their respective countries, and it is still difficult to find salaried jobs or cash-generating activities in these areas. Finally, drylands are the home of marginalized peoples, sometimes considered by others or by themselves as being 'indigenous'. This has led to the intertwining of conservation and indigenous rights movements, both in cooperative and in confrontational form (Saugestad 2001; Chatty and Colchester 2002; Shetler 2007; Zips-Mairitsch 2013; Dieckmann et al. 2014).

The enlargement of conservation areas in this context has frequently been developed against the will of the dryland populations, neglecting—or at least side-lining—their views and opinions. In some cases, the establishment of PAs has led to the displacement of local residents (Neumann 1998; Gibson 1999; Brockington and Igoe 2006). In other instances, people have not been forced to move, but they have lost, totally or partially, access to some areas or to some natural resources (Gibson 1999). Exclusionary policies were often informed by views of communal pastoralism as 'unproductive' and harmful to an environment in rapid decline (Homewood et al. 2013: 240; Mortimore 2013: 118–120).

In the 1980s and 1990s, CC programmes were initiated, in drylands and other areas, as an attempt to break with previous more exclusionary policies. They advocated the devolution of powers over natural resources to local communities and the right of peasants and pastoralists to access and use them. Research shows that the effects of community-based schemes have been mixed. They include cases where communities have gained or retained some measure of control over natural resources and received economic benefits from conservation-related activities, but also many instances in which community-based natural resource management (CBNRM) has curtailed local autonomy and hampered agro-pastoral livelihoods (Taylor 2000; Dzingirai 2003; Hohmann 2003: 209–211; Nelson and Agrawal 2008; Rihoy et al. 2010; Hoon 2014).

In a recent evaluation of community-based conservation in Africa, Galvin et al. (2018) found variable results, with a majority of mixed or negative outcomes. It must be mentioned, however, that in East and Southern Africa evaluations were more positive, and higher levels of devolution and community involvement were detected there, than in West and Central Africa.

We provide below several case studies of conservation schemes—ranging from strict fortress conservation to relatively positive CBNRM initiatives—in order to briefly illustrate the diversity of actors and processes involved in conservation in drylands, as well as the differences in settings, approaches, and outcomes.

Oman

Grabbing land has become a common feature of the semi-arid and arid lands of the Middle East. Initially exemplified by the early to mid-20th century multinational petroleum industry 'land grabs' based on the notion of *terra nullius* (a land empty of people), this later became extended to include unrestricted conservation access to significant grazing lands occupied by pastoral herders for centuries. Focusing on the Harasiis tribe in the Jiddat-il-Harasiis, Sultanate of Oman, this case study explores the lived experiences of the Harasiis and the reintroduction of the Arabian oryx into their traditional territory by the World Wildlife Fund (WWF) in the 1980s. It was the reintroduction of an animal that had been made extinct in the region a decade earlier owing to overhunting by sports enthusiasts. The project was based on the widely held 20th-century notion that animals and people could not share the same landscape. Thus, a significant sector of the traditional lands of the mobile pastoral Harasiis tribe in the Jiddat-il-Harasiis, which had been identified by Western conservation experts to receive the first few dozen Arabian oryx flown in from zoos around the world, was set aside without consultation with the local population.

For the first three years of the project, there were no conflicts between the Harasiis tribe and the growing expatriate conservation management team at Yalooni and other Omani employees. Gradually, however, difficulties began to appear. The first of these difficulties manifested itself in terms of competition over grazing between the herds of domestic goat and camel and the reintroduced oryx during prolonged drought (Stanley Price 1989: 212–213). Just a couple of years after the sanctuary had been set up, the lack of rainfall in other parts of the Jiddat drove a number of families into the area designated as protected. The Yalooni management informed the Harasiis families that they could no longer camp nearby. The Harasiis were bemused at first but then became annoyed and angered. 'Grazing and browsing is very limited; why are our animals not as important as the oryx?' they asked. This tension was never resolved. It was followed by conflicts between the Harasiis tribe over access to the limited employment positions as oryx trackers—and the special benefits that accrued, such as water to take back to their homesteads at the end of a work shift and occasional free petrol. This was then followed by arguments and threats between the Harasiis and the neighbouring Jeneba tribe, who shared a fuzzy and fluid border. The Jeneba were

outraged that they had been ignored in the conservation effort, even though they had little experience of life in the core desert area and were totally inexperienced at tracking.

Although the goodwill with which the project was initially accepted by the Harasiis remained evident among the older generation, who had grown up with the oryx, the younger generation began to express their lack of commitment to the reintroduction scheme by a silence that bordered on complicity. Although the young Harasiis recognized the appearance of poaching (first reported for gazelle in 1986) and its yearly increasing level by their rival tribesmen, they rarely reported it. Unlike their elders who had manned the 'gazelle patrols' in the 1960s and 1970s and brought individuals suspected of poaching gazelle to the attention of the police, the younger generation just sat by and watched the live capture and poaching of oryx occur. This change of attitude and support among the local people pointed to the flaws in planning, design, and implementation that top-down conservation projects all too often make.

The Harasiis had been greatly saddened by the extermination of the oryx. The animal had once graced the whole of the arid desert regions of south Arabia; it had been pursued and hunted until, by the middle of the 20th century, it was found only in the Jiddat (Stanley Price 1989: 37). The tribe had seen the progressive decline in numbers take place and had recognized the looming tragedy. Their stories and campfire tales spoke about this decline. But they had been unable to stop the motorized hunting parties that descended upon them in search of oryx herds. The idea of setting up an oryx sanctuary in their traditional territory had never been discussed with them, nor had they been consulted on the most suitable area to place such a sanctuary. The aims of the project, its goals, the implied restrictions on infrastructural development, and even the importance of their cooperation were never put forward to the tribal community. Once this internationally supported project had actually commenced, however, the Harasiis went along with the spirit of the enterprise; they could hardly stop it. They did feel a sense of pride in seeing the oryx returned to the Jiddat-il-Harasiis. And for a limited number of men, there was the opportunity of paid employment as 'oryx rangers' tracking and generally keeping an eye on the reintroduced animals.

As long as the Harasiis were perceived to have no aspirations of their own, no desire to see an improvement in their access to water, and no desire to have regular road grading or infrastructural development in their traditional homeland, relations with the oryx reintroduction project remained untroubled. But the Harasiis, like people everywhere, were opportunistic. They wished to improve their lives and had no special desire to remain in some sort of pristine traditional state just for the sake of such 'protectionist conservation'. Slowly at first, and later with greater urgency, the Harasiis came to realize what was being expected of them and the constraints they were under. They came to understand that, in drought conditions, they were expected not to camp within the vicinity of an oryx herd, even when all other grazing areas were depleted. At about the same time, the tribe's long-standing campaign to have a water well dug by the Ministry of Water and Electricity, in a promising area north of Yalooni, appeared to be blocked by the

advisor responsible for the oryx reintroduction project. Furthermore, the Harasiis felt that efforts to get the national petroleum company to regularly grade roads in this north-eastern quadrangle of the Jiddat where the oryx project was located were also being thwarted.

In 1986, a significant part of the Jiddat-il-Harasiis was identified for a national nature reserve as a preliminary step in turning the entire Jiddat into a UNESCO World Heritage Site. In 1994, the Jiddat was established, by royal decree, as the Arabian Oryx Sanctuary. Few, if any, Harasiis understood that the decree was the first step towards dividing the Jiddat into three land-use zones: a core area with the strictest environmental protection; a buffer zone, with a fairly strict protection, in which a limited number of activities would be permitted if they were compatible with conservation objectives; and a transition zone where most activities would be permitted unless clearly damaging to conservation objectives (Pretty et al. 1994).

Working quietly and consistently for the past 20 years, the Harasiis tribe have begun to challenge this conservation zoning system. They have succeeded in overcoming strong expatriate resistance to having a reverse osmosis water plant built by the government in an area that is considered a buffer zone of the sanctuary. This has created major difficulties for the oryx management team. A similar situation is likely to occur in respect to local roads. The management plan intends that a careful network of local roads be established 'in consultation with the stakeholders in the area'. These are, in the following order, wildlife conservation, tourist access, mobility of government staff, and finally the '*legitimate movements of the indigenous pastoralists*' (emphasis added). The Harasiis and Jeneba tribes are unlikely to allow themselves to be the last considered, as though only an afterthought. Quietly and persistently, as in the past, they will work to achieve what they feel is necessary for the needs of their communities.

Two representations of the desert landscape came to a head in the Jiddat-il-Harasiis: a Western conservation protectionist vision of a pristine landscape of plants and animals; and a local tribal vision of a landscape where there were sets of cultural and historical concepts relating people and domestic animals to desert spaces and places. When, between 1996 and 1998, poaching and illegal capture of the oryx by rival tribes resulted in the loss of more than 350 animals, the Harasiis could do little to stop this downward spiral. Other tribes were actively acting out their disaffection; the Harasiis youth had become alienated; and the Harasiis elders were no longer interested in the landscape transformed by the oryx project from which they had been displaced. In 2007, The Arabian Oryx Sanctuary became the first World Heritage site to ever be deleted from the UNESCO list of World Heritage Sites. The justification for this unprecedented step was the rapid decline in oryx number (from 450 to 65) and the supposed degradation of its grazing area.

Caucasus

In the Caucasus, grazing has been practised for centuries, including transhumance in local and regional systems. In the Vashlovani region, between Georgia and

Azerbaijan, under the influence of transhumance and traditional cross-border use the dry steppes and badlands, interlocked like a mosaic with a pistachio savannah landscape, became a diverse cultural landscape. Another defining element of this case study is the influence of the Vashlovani National Park, in the very east of Georgia, directly on the border with Azerbaijan. Its area had been a large Soviet PA since 1935, and it was designated as a UNESCO nature and landscape protection area in the 2000s.

With the establishment of the Soviet regime at the beginning of the 1920s, pasture management was subject to a radical upheaval. The feudal system that prevailed before 1914, occasionally also interwoven with semi-nomadic forms of pastoralism (Gracheva et al. 2012; Aliyev 2015), was fully collectivized by the state during the twenties and thirties of the last century.

With this collectivization, large estates were nationalized and pasture *kolkhozes* (collective farms), later *sovkhozes* (state-owned large-scale farms), were established. From the 1940s onwards, the herd sizes reached as many as 10,000 animals, both in western Azerbaijan and in Kakheti (eastern Georgia) (personal communication from shepherds to Heino Meessen 1986, 2017). The transhumance systems were well organized, and the passage routes were kept free and supported by infrastructure for the shepherds, passage pastures, and water points. While the grazing of the high pastures—cross-border between Azerbaijan and Georgia—was organized by the state and agreed between the large farms, parallel to this there was some sort of communal use of the pastures near the village and the 'alpine pastures' of high mountain valley communities. Each family was allowed to use smaller areas independently for grazing, and the village soviet accepted small herds, consisting of the animals of the individual households, on the nearby high pastures—and thus a kind of tolerated commons existed.

Today an international border cuts through what used to be a more permeable region. Pastoral management, the intensity of use of winter pastures, and nature conservation as a conflict factor for pastoralism have developed very differently in Georgia and Azerbaijan. The basic elements for conflict in pasture management were already laid out by Stalin during the Soviet era through the demarcation of the border between the Soviet republics, dividing areas settled by common ethnic groups. Near the border and up to 50 km to the east in Azerbaijan, there are still 'Georgian villages'. Conversely, there are also non-Georgian villages in East Kakheti on the Georgian side. Between these ethnically identical villages on both sides of the border, there still exist family and economic relationships, as well as informal (not state-recognized) regulations governing mutual access and cross-border 'pasture management'.

However, this landscape is now under two distinct state regimes (Neudert et al. 2020): The state in Azerbaijan pursues a restrictive policy with regard to local pasture management, rendering any form of local management practically impossible. This applies above all to efforts in this direction on the part of local NGOs, but also to initiatives on the part of local state administrations—in particular to Belokan and Zakatolo districts, which are near the Georgia border. The state invests profits from oil and gas primarily in clearly visible infrastructure (e.g.

main transnational roads and city halls) along the main development axes. No investments are made in infrastructure for pasture management or in supporting small businesses. In Georgia, in contrast, local non-governmental institutions with a focus on sustainable pasture management have become possible or are even fostered since around 2012. The local administrations definitely want local interest groups (e.g. shepherds' committees) to take over and monitor pasture management. National legal bases and ordinances at the local level for an orderly pasture management are aimed for—and in some cases already in progress (REC Caucasus 2019). Nature and landscape protection are also better implemented in Georgia than in neighbouring Azerbaijan. This is particularly true due to the national park. Based on the UNESCO objectives for nature and landscape protection, the government aims for participatory sustainable regional development with the involvement of local shepherds and farmers for more than 50% of its total area.

Sheep farming in Azerbaijan (especially when run by small local farms, including their regional transhumance systems) is currently viewed as marginal structures that have remained from the Soviet era. It is perceived by the government as harmful rather than economically important, based on a perceived lack of pasture management. There is a conflict situation with the newly established large farms, which with 3,000–5,000 animals from faraway lowland districts are pushing onto the alpine summer pastures. Grazing by these large flocks, plus the rather minor grazing caused by local farmers, leads to overstocking of the summer pastures in some places (Ismayilov and Jabrayilov 2019). For the small, local livestock holder, however, sheep farming is living capital and it makes a substantial contribution to the food security of families in the Caucasus mountain area and to the revitalization of the local economy. The routes from winter to summer pastures are said to be heavily overgrazed. Locally, this has been confirmed in participatory workshops with local herders in both countries, conducted in 2014–2016 together with local researchers and government stakeholders (Maisuradze et al. 2016). Outside these transhumance axes at the southern foot of the Caucasus, extensive winter pastures stretch out. These border on the Georgian side on the Vashlovani National Park. On the Azerbaijani side, the adjacent area is not under nature protection, and it is also described as being rather overused as a winter grazing area. However, narratives of overuse in this area certainly require a closer look (see for example research in eastern Pamir: Kraudzun et al. 2014).

The effects of this splitting up of the pasture economy can therefore be described as negative because the condition of the transit routes in Georgia from summer to winter pastures and the conditions of the infrastructure (e.g. rest areas, watering points, and wells) for transhumance herders have significantly worsened over the past 20 years. Some routes in Georgia are completely blocked at key topographical points (e.g. on motorways or markets). Georgian pastoralists are often in conflict with regard to transit routes and transhumance. As a result, summer and winter pastures in the foothills of the Caucasus in Georgia are overgrazed, and the high pastures fall fallow because the earlier reciprocity and mobility regulations no longer apply.

At the national level, there are conflicts in both countries between pastoralists and arable farmers and also between large and small livestock farms. In both Azerbaijan and Georgia, the holdings in the Vashlovani region mostly have sheep and goats, with herds of 50–5,000 animals. Large companies are increasingly displacing the less well-organized but flexible small companies. The large ones produce for the export of live animals, increasingly to the Arab Emirates. Land that could be used also by smaller herders is 'grabbed' for export production by large livestock holders. Within the Vashlovani National Park on the Georgian side, disputes between shepherds and farmers and wine growers are the order of the day. Great damage can occur to valuable crops such as grapes, fruit, and tobacco, as the shepherds often do not come from the closer Vashlovani region and rarely show consideration for local producers.

A cross-border conflict between nature conservation and grazing has developed in the last 10–15 years owing to the introduction of a core zone of the national park, with a more stringent protection status. On the Georgian side, the national park and especially the strictly protected core zones are under strict supervision. Conversely, the Azeri side of the Vashlovani badlands does not have any protection status. Here, pasture management takes place on a large scale. Large numbers of animals and overgrazing make pasture management necessary but currently results in a great deal of pressure on the livestock owners. This pressure leads to informal cross-border cooperation in transhumance between the livestock owners on both sides. Informal regulations have now developed that have an ethnic character: The Azeri shepherds place their flocks of sheep near the border or even drive them across 'without a passport'. A Georgian—but ethnically Azeri—shepherd then takes over the flock on the Georgian side. The informal agreement also means that the sheep can be driven back across the border to Azerbaijan at the end of the season. But when these Azeri sheep 'without a passport' have crossed the border, the rangers of the national park on the Georgian side can often no longer maintain the strict protection requirements. As a result, direct conflicts arise between the large, mostly Azeri, herders and the smaller, local Georgian herders. This situation paves the way for ethnic conflicts. Violence between the local Georgian and Azeri shepherds (living in Georgia), if they encounter each other, is said to have already occurred.

The solution to these conflicts would have to be pursued at various levels. One means of conflict mitigation would be the use of methods related to natural resource governance and participation as they have been developed by development agencies and NGOs. In this specific case, this would mean the systematic effort in the affected areas to involve shepherds, managers of large sheep-breeding farms from both countries, and the other smaller livestock holders and farmers mentioned above in a process of exchange and negotiation of possible solutions. However, the involvement of these actors in Azerbaijan is difficult due to a lack of governance structures and even to explicit bans on community-based organizations. In Georgia, on the other hand, the national NGOs are strongly involved in such efforts, also in cooperation with the ministries for infrastructure and regional rural development. International NGOs and donors endeavour to promote

such approaches in the border area between Azerbaijan and Georgia. Informal cooperation between the stakeholder groups, as is already practised in part, can form a basis, but communication and exchange across ethnic borders must also be improved.

Furthermore, bilateral governmental discussions at a higher level, through the agriculture ministries, are necessary; otherwise, natural resource conflicts can easily escalate and lead to violent conflicts. This is particularly evident in the Vashlovani region, given the described conflict between nature conservation and cross-border transhumance.

This example makes it clear in general how important the institutional dimension is within approaches for sustainable management of natural resources. In principle, the status of the national park as a UNESCO PA would certainly allow the use and participatory pasture management in large areas, but so far many conflicts remain unresolved.

Kenya

This case study explores the experiences of today's agropastoralists who live in close proximity to the Lewa Wildlife Conservancy (LWC) in Kenya's semi-arid to arid drylands north of the conservancy (Weissman 2017, 2019). Northern Kenya's agropastoralists have been faced with land grabbing since colonial intervention and to this day struggle with recognition of their former commons in an area that was for a long time considered 'empty land' by the colonial government. While the locals' fight for land rights has been constantly challenged by consecutive governments over the decades, new expanding conservation initiatives have added an additional, transnational dimension to the issue of land grabbing and can, in this case, be added to a particular instance of green grabbing where the valuation of species plays an important role in shifting bargaining power positions and institutional change.

It was not until the 1970s that people living near the northern boundary of the then Lewa Downs cattle ranch were acknowledged as inhabitants of this area. The narrative depicting people as having only recently appeared has persisted on the side of LWC's officials as well as in historical accounts and court documentation,[5] albeit a very long presence of both nomadic hunter-gatherers and pastoralists contradicts it. The 1970s, however, are coincidently the same time that permanent settlements started to appear where pastoralists began cultivating crops along seasonal and permanent streams close to the ranch, which from the 1980s onwards was turned into today's conservancy. Omitting a nomadic presence goes a long way in disproving an original peoples' presence, in the process of legitimizing one's own arrival as new settlers to a seemingly 'empty' land (McAuslan 2013; Weissman 2019).

This ranch at Lewa Downs in turn was established in the early 20th century with the soldier settlement scheme, under which fertile lands were allocated to British settlers after the First World War (see Morgan 1963; Duder 1993). Over time, this ranch at Lewa Downs came to be the property of the Craig family,

who in the 1980s established a rhino sanctuary and later in the 1990s expanded the entire farm to become the PA known today as the LWC. In 2004, another organization then grew out of efforts by the founder of the LWC and others that led to the establishment of the Northern Rangelands Trust (NRT), an umbrella overseeing the implementation and management of community-based conservation organizations. They have since grown to include roughly 43 communities and 49,000 sq km as of 2021. The area known as Leparua, one of these Communal Conservancies under the NRT, borders the LWC to the north and is mostly settled by a former pastoral group of Maasai now turned agro-pastoral. In addition, there are further semi-pastoral communities living close to Isiolo town that are part of the conservation committee. While they share some of the same spaces with the Maasai, their institutions and land-use practices differ greatly (Weissman 2019).

According to oral histories, the pastoralist groups in the area were continuously displaced from the early 20th century onwards. Not only were their rangelands not recognized as occupied, but the areas where they grazed their livestock were for a large part under quarantine (in today's southern part of Isiolo County), and their movements thereby restricted. These agropastoralists, who are today described as Ndorobo Maasai, only selectively identify with this rather derogatory ascription, since they trace their own belonging to early hunter-gatherer groups turned pastoralists, who speak the Maa language and who follow the Maasai age-set system, interacting closely with other Maasai in the region and to the south in Kenya. They have also recounted that they follow or followed an institutional arrangement that manages common-pool resources as a commons. These commons, however, no longer function as such, since today the restrictions on grazing are manifold and, in combination with conflicts with other pastoralist people, do not allow for rotational grazing. Land-use restrictions include numerous areas where land has become privatized, militarized, allocated to government agencies, or occupied by several groups of people practising other forms of pastoralism or resource use, and of course they also include new land-use strategies in conjunction with the expanding conservation agenda throughout the northern rangelands (Weissman 2019).[6]

The two valleys to the north of the LWC are known as Leparua and Ntalaban and in 2011 they joined the NRT as a CC. The 342 sq km area has two settlements of the 'Ndorobo Maasai' in the mentioned valleys close to LWC, and three other communities further north, close to Isiolo town. Although still young, the conservancy status has brought an additional institutional shift that carries novel land-use strategies that can be both beneficial as well as problematic.

On the one hand, the status as a CC relieves some pressure on conflict potential through the presence of an NRT-trained ranger team (Figure 8.1). This ensures heightened security where conflicts are mitigated by personnel that function both as wildlife protectors as well as mediators among rivalling groups. On the other hand, the interests and opportunities are redistributed towards an environmental ideology and practice, where individuals or communities are rewarded in one form or another for conservation-friendly behaviour (see Fletcher 2010). This

Figure 8.1 NRT rangers patrolling Leparua Community Conservancy (2016). Photo taken by Samuel Weissman.

is especially the case because rules and regulations within the formal institution as directed by the NRT are placed on a stage of global proportions, where various transnational interest groups have a say (Weissman 2019).

In essence, the case study shows how this has reduced the agropastoralists' bargaining power in matters of determining best land-use practices. In order for the Maasai community to reestablish their institutions or adapt them to current situations and gain legitimacy over land and resource management, it would first require actual land rights that are formally recognized under Kenyan law. Since the Maasai have not yet achieved this and the only quasi-security over land is through the conservation status, the regulations and rules about land use are predominantly set at the intermediate level of NRT's conservancy committee. The structure for creating revenue and income therein are therefore dependent on the same donor mechanisms, which lead to strong outside influence and oversight, leaving little bargaining power and control over processes by local institutions and in turn creating uncertainty in the bottom-up institution building, therefore, also weakening resilience. The mechanisms of neoliberal environmentality (Fletcher 2010) at play have thus created an award-based system where unifying under one institutional setting has proven difficult, creating an anti-politics machine (Ferguson 1990) and institution shopping (Haller 2019, 2020), in which the commons are no longer viable and various actors seek different opportunities by aligning along different

ideologies and identities throughout the value chain, from the Leparua CC to the international groups of donors scattered across the globe.

Namibia

In 1996, the Namibian government introduced the Nature Conservation Amendment Act, which permitted the establishment of CCs. On communal lands, CCs are granted the right to manage wildlife within their boundaries, as well as an annual quota of hunting for trophies and for consumption, and they can initiate communal tourism enterprises or joint ventures with private partners. Income from these activities goes to the CC, which then decides how to distribute it among the community. Jurisdiction over land, however, remains in the hands of Traditional Authorities (TAs), who allocate individual plots in the first instance, while regional Land Boards and the Ministry of Land Reform confirm and supervise the TAs' decisions and are in charge of leases of larger plots for commercial purposes. The number of registered CCs has grown rapidly since the late 1990s, and by 2017 there were 83, occupying, together with Community Forests, 53% of all Communal Areas (NACSO 2018).

Nyae Nyae Conservancy (NNC) was the first to be officially registered in 1998 and is the second-largest in the country, with an extension of 8.992 sq km. Located in Tsumkwe East district, in Otjozondjupa Region, its approximately 2,300 residents are mostly Ju/'hoan San. It consists of 'semi-arid tree and bush savanna', with very little water, being dependent on rainwater and boreholes tapping underground sources. Land is mostly flat, rainfall is irregular, and the soil has an 'extremely high evaporation' level. Nyae Nyae is very rich in game (Mosimane et al. 2007: 6; Biesele and Hitchcock 2011: 40–44; NACSO 2012: 5).

Ju/'hoan San have lived in this area of the Kalahari since ancient times, leading a hunter-gatherer way of life that did not mean a complete isolation from neighbouring communities or the absence of other economic strategies. Ju/'hoan traded with Herero, Tswana, and Owambo and took an active part in the expansion of commercial hunting promoted by both Europeans and Africans in the 19th century (Wilmsen 2003: 82–88).

The region was remote from government centres and white farming areas for most of the colonial period. In 1976, it became part of a new homeland, Bushmanland, established by the occupying South African administration as part of its plan of racially and ethnically segregated land distribution. It was the only territory of the country officially recognized as belonging to a San community. Wide areas of land historically occupied by Ju/'hoan, however, were transferred to the Hereroland homeland and to the new Kaudun National Park.

During the 1980s, different foundations and cooperatives, organized with the assistance of anthropologists and activists, helped the Ju/'hoansi to plant gardens and raise small herds of livestock. Scarcity of water, borehole breakdowns, and game depredations hampered these efforts. After independence, the Nyae Nyae Development Foundation of Namibia (NNDFN) was instrumental in preventing the conversion of Nyae Nyae to a game reserve and supported a model of CC that

secured the control of land and natural resources by the Ju/'hoansi, with ecotourism as an increasingly important source of income (Biesele and Hitchcock 2011: 9–12, 17, 82–84, 100–107, 156–158).

Jo/'hoan live in approximately 40 settlements scattered throughout the conservancy and currently practise a mixed economy that includes hunting, gathering, crop growing, livestock, working for neighbouring herders, and the reception of food aid from government and NGOs. Agriculture is hampered by water scarcity and elephant raids. It is mostly dryland cropping, although there is some irrigation of maize, mahangu (millet), sorghum, and vegetables (Biesele and Hitchcock 2011: 46–47, 217–218; NACSO 2012: 6).

The NNDFN is charged with the management of the conservancy funds. There are more than 20 full-time employees, and NNC's income amounts to approximately N$7 million (€460,000) in 2017, about 75% of which was generated by trophy hunting (NACSO 2018: 70). These revenues, coupled with a small resident population, allow NNC to be one of the few conservancies that make cash payments to individual members every year.

Despite these considerable returns, dissatisfaction has been expressed by sectors of the community, and in 2012 and 2014 a diversity of opinions could be reported. Amid majority satisfaction, there were complaints that the 'conservancy's benefits were not increasing'.[7] Coupled with that, controversies over the role that agriculture is expected to play in Nyae Nyae have also erupted. Some of the activists involved in agricultural projects in the 1980s, such as John Marshall, have remained heavily critical of the emphasis on tourism and advocated more investment in agriculture and livestock, and some people felt that the old cooperatives were more supportive of agro-pastoral initiatives. The NNDFN and the conservancy, though, believe that this is difficult owing to soil and climatic conditions. They have initiated several livestock projects, however.

Relationships between the Chief and the Conservancy have been generally good, and the TA has representatives in the Management Committee and receives yearly payments. Certainly, the process is not always so simple, and tensions over land-related decisions do exist. Some instances of disputes among the Conservancy and the TA regarding the use of Conservancy income have also been reported.

In terms of land, though, one of the main consequences of the Conservancy has been the provision of stronger legal and political claims by the Ju'hoansi when it comes to deal with expansive neighbours. Herero's historical presence in Nyae Nyae has already been mentioned, and in the 1950s some groups brought some of their herds to G/am, a waterhole south of Nyae Nyae which traditionally belonged to the Ju/'hoan, which was later integrated into the Herero homeland. In 2009, Herero from G/am entered Nyae Nyae again, thus breaking both State veterinary rules and the NNC's constitution. Most of their cattle were eventually impounded by the government, but the number of Herero people in Tsumkwe town has continued to grow. They own horses, donkeys, and small stock, which are considered illegal to keep within the municipal lands. Violence against Ju/'hoan became common and clashes between the two communities erupted (Biesele and

Hitchcock 2011: 86, 223–224). As they stay within the approximately 30 kms^2 of Tsumkwe town, and therefore outside the Conservancy, they cannot be forced to leave. Pastures around town are already 'overgrazed', and they are using 'water resources nobody is paying for'. They also bring their cattle to graze into NNC's lands. Until now, 'ministries have very little will' to expel them. The Herero's presence is clearly resented by all sectors of the Ju/'hoan population, and a history of conflicts is not forgotten.[8]

It is true that both the TA and the conservancy feel powerless to redress the situation, as NNC does not have direct jurisdiction over land, and the chief requires government action to actually remove people or livestock from the area. The Conservancy has failed to protect Ju/'hoansi lands fully. But, as already indicated, NNC and the neighbouring Na Jaqna area are the only lands in Namibia officially recognized as belonging to the San, and there is a clear understanding on the part of the community that conservancy status is their strongest legal weapon and that without it their position would be much weaker. This is confirmed by the dire situation of San communities living on communal lands under other groups' authority and of those being settled on former commercial farms acquired by the State under the process of land reform.

Green grabbing and its complexities

The four cases that we have presented show the difficulties that conservation initiatives face in different settings. As a matter of fact, it is worth mentioning, in response to the problems involved in CBNRM schemes, that some countries have developed a certain reversion to 'fortress conservation' and a retrogression on the already feeble devolution mechanisms put in place (Wilshusen et al. 2003; Hutton et al. 2005; Hoon 2014).

Political ecology approaches, as illustrated in the foregoing case studies, have shown how environmental changes are not simply 'natural' processes but are crucially shaped by power structures and relations as well as by socioeconomic inequalities. Conservation policies, therefore, are not 'technical'; they are closely interconnected with local and international politics and economics (Le Billon and Duffy 2018).

In this sense, it is important to keep in mind that green grabbing is not a linear process in which homogeneous 'traditional' communities are dispossessed by an alliance of monolithic States, companies, and conservation institutions. Communities are often marked by political, ethnic, social, economic, gender, and age division, and local actors have different interests and objectives, leading to complex interactions with outside State and private agents (Monjane 2010; Fairhead et al. 2012: 247–248, 253; Dekker et al. 2020). In Mara, for instance, landowning households near the reserve obtain significant benefits from conservation and tourism, while in many other places in East Africa, benefits do not compensate costs and restrictions (Homewood et al. 2013: 241–245). It is worth remembering as well that, as Greiner (2016) warned and our Kenyan case study shows, common management institutions may experience problems before conservation makes its

appearance and be perceived by locals as no longer capable of dealing with new circumstances and conflicts. In some cases, this may lead to local demands for individual land titles.

Similarly, 'States', 'investors', and 'NGOs' are far from sharing a common agenda, and each of these categories is at the same time divided. There is no agreement on the vision of conservation as a priority activity in drylands or on how to combine it with local agropastoralism and with private investments in other economic sectors (Kabiri 2010; Akker 2016; Gargallo 2020).

It is also necessary to highlight that conservation programmes may lead to the emergence of new common-property management institutions, the so-called new pastoral commons (Bollig and Lesorogol 2016). Especially relevant in East and Southern Africa, these new institutions are usually the fruit of a complex and unstable combination of local actors, State agencies, and NGOs. To a larger or lesser extent, they attempt to integrate old forms of communal management into the new patterns of natural resource use and commercialization.

These institutions—as well as intended or unintended economic and environmental impacts—and local reactions to the new situation can sometimes reframe, at least partially, the results of conservation schemes to the advantage of drylands communities (Haller et al. 2016). More frequently, however, top-down approaches and the dismantling of common resources management prevail (Nelson and Agrawal 2008; Haller and Van Dijk 2016; Dekker et al. 2020) and also undermine pastoral resilience in drylands (Haller 2020).

Conservation programmes are also having an impact on territorialization—that is, the division of land, the creation or reinforcement of territorial boundaries, and the power to distribute and manage it. This often leads to green grabbing and the reproduction of fortress conservation models, as we have seen, because through colonial and postcolonial processes common property of pastoralists and institutions of mobility were transformed into state property, and PAs were perceived not as previous cultural landscapes but as pure nature (see also cases discussed in Haller 2020). On the other hand, in some places, the development of new communal institutions charged with the implementation of conservation initiatives has been useful in curtailing attempts by states and local elites to advance towards greater individualization of land tenure and large-scale agricultural interventions and has provided communities with enhanced management rights over their lands (Humphries 2012; Bollig 2016: 775, 779–781; Gargallo 2020).

Conclusion

As this chapter has shown, green grabbing has been a growing trend in many dryland areas, amidst global processes of investment in previously marginal territories and the opening of new frontiers of investment. Conservation-related initiatives have often neglected the views, knowledge, and interests of local communities, or have been developed against their wishes. In many contexts, pre-existing conflicts—over land, natural resource access, economic opportunities, political power—are exacerbated.

It is an error, therefore, to view conservation as something intrinsically 'good' or 'positive', as well as approaching it as a 'technical' issue dealing with 'natural' processes. All conservation schemes imply political and economic choices, normally advocated by national and international elites and benefitting or marginalizing specific communities or individuals.

It is equally important, however, to retain a nuanced vision of conservation origins and impacts. All actors involved, from states, companies, local authorities, and communities, are divided and not homogeneous. The priority accorded to conservation over agriculture, livestock, mining, or any other economic sector is far from straightforward or consensual. Within communities, identity, economic, social, gender, and age divisions are often prevalent, and they lead to different views on conservation programmes. Finally, conservation has provided some benefits to dryland communities, or sections within them, be it in terms of increased income, enhanced land control, or support to identity claims.

Unfortunately, such positive outcomes are still in a minority, and some of the most expansionist and restrictive conservation plans being advocated do not augur well for the future, unless a clear commitment to give a leading role to dryland communities is made, and a critical revision of some of the paradigms directing conservation programmes is developed.

Notes

1 www.protectedplanet.net [Accessed 9 October 2020].
2 www.half-earthproject.org [Accessed 7 October 2020].
3 Zero Draft of the post-2020 Global Biodiversity Framework, CBD, January 2020.
4 See Chapters 5 and 6 of this volume.
5 The narrative was recorded in several interviews held with managers and officials in the LWC as well as in the Northern Rangelands Trust in 2015 and 2016. Additional, similar interpretations can be found in documents from early court cases where pastoralists appealed to their land rights (see Weissman 2017).
6 Taken from various interviews in 2015 and 2016. Historically it can also be gathered from the British foreign jurisdiction act of 1890 that rangelands were generally considered unoccupied and ungoverned (see Klopp 2000: 15).
7 Interviews with management committee members, residents, NNC, and NNDFN representatives, Windhoek, 2012 and 2014.
8 Interviews with management committee members, residents, TAs, NNC, and NNDFN representatives, Windhoek, 2012 and 2014.

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Part III

Conflict, connection, and livelihoods

9 Religious movements in the drylands

Ethnicity, jihadism, and violent extremism

Han van Dijk and Mirjam de Bruijn

Introduction

Over the past decades, extremist violence and jihadism/religious movements have become an important factor in the political and economic developments of drylands. In this chapter, we try to understand what the factors are that contribute to this development. There is a certain parallel with the past, when the drylands were also the stage of jihad and extremism; however, as we will argue in this chapter, we should pay particular attention to the different conditions under which such violence occurs. Our central questions are these: What creates the contemporary violent condition of the drylands? How does this compare with the past, and what is different in the present that can help us to understand the phenomenon? We will take the example of the Sahel as our focus of analysis. But first, we will sketch the general situation in the drylands. One of the main arguments that we put forward in this chapter is that these upsurges in violence and extremism can be understood as local resurrections, which are informed not only by feelings of marginalization and distance from the state, but also as part of new forms of warfare, in which guerrilla tactics and violence have become the principal means of combat.

This evolution has been attributed to a variety of underlying dynamics that are typical for drylands, including increasing scarcity of land and water due to climate change; a growing population; the poor performance and authoritarian character of states; increasing displacements and resettlements related to large-scale investments—for example, in extraction and mining; and progressive marginalization and exclusion of specific social groups. In addition, increasing levels of conflict between population groups have provided a fertile ground for recruitment by armed groups for self-defence and religious purposes, often along ethnic lines, and also to secure access to natural resources. The lack of state capacity to maintain a monopoly on violence and the often partisan management of conflicts by government officials, as well as military interventions by outside actors (private and public), have all further contributed to the deterioration of the security situation. In this chapter, we try to understand the link between these 'violent conditions' (cf. Laurie and Shaw 2018)[1] and the emergence of armed groups, and the rise of

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religious movements, jihadism, and terrorist violence in the drylands of Africa, the Middle East, and Central Asia.

One of the narratives about drylands (see Chapter 3, this volume) is that drylands are hotbeds of extremism and terrorist organizations (Andersson 2016). Indeed, several countries in the Middle East, in West, North, and East Africa, and in Central and South Asia have become the home of civil wars and insurrections against the state, intercommunity (and interfaith) warfare, terrorist attacks, and political instability in general. Yet there is no necessary connection between extremism and drylands, and not all drylands have known a chronic situation of political instability. Iraq, Libya, and Syria were stable countries for a long time under strong dictators, until a combination of foreign interventions and local insurgencies led to the (near) collapse of these regimes. Apart from smaller insurgencies of Tuareg desert nomads in Mali and Niger, the western Sahel region was relatively stable for decades. Instability in Chad and Sudan, although almost chronic, was not associated with religious extremism but was the result of political tensions between different parts of the country and population groups and their government.

More recently, we have witnessed the emergence of religious movements inspired by Salafist interpretations of Islam. In a number of countries, insurgencies that label themselves as Muslim jihads and have adopted orthodox versions of the Islamic faith have emerged and built up considerable support and power, often filling up power vacuums left by the state. The most important example is of course the takeover of power (twice) by the Taliban in Afghanistan. Other examples are ISIS's filling of the power vacuum in the west of Iraq and the north of Syria, Al-Shabaab in Somalia, Boko Haram in northeast Nigeria, a new movement in northern Mozambique, and many others in Libya and several Sahelian countries.

In this chapter, we will explore the emergence of religious extremist groups by looking at the situation in the western Sahel and try to provide a little more background as to why these groups emerge and what they say about the current situation in drylands. As we will argue, the insurgency in the western Sahel is neither an exclusively terrorist movement fielded by extremist jihadist intruders nor a conflict connected to climate change or a Malthusian battle for resources, but to a large extent it is the expression of much deeper social, economic, and political dynamics that have marginalized rural areas (and their youth) and have found expression through an extremist religious movement. Jihadism is thus an expression of a much larger set of issues, rooted in political economy, marginalization of minorities, and economic stagnation in rural areas and is entangled with local struggles for power, malfunctioning and exploitative governance relations, and the failure of the state to provide basic public services.

Extremism and radicalization in drylands: the emergence of 'new wars'

Extremism is primarily regarded as something out of the ordinary, in contrast to a normal way of thinking and behaving. It may be defined as 'actions and

ideological programmes that are boundary breaking that attack convention and rule and which in some way or another defy the status quo' (Loperfido 2021: 1). It is often associated with radicalization, a process in which people adopt new ideas and often also enter a new social environment (de Bruijn 2018: 4). Extremism and radicalization are of all times and of all regions in the world. They may lead people to make a choice for violence and violent behaviour. Extremism and radicalization do not have to lead to violence and terrorism; they can just as well be forms of political mobilization to achieve certain political objectives in a peaceful manner and may emerge in many contexts. In the current context, extremism is also often associated with religion, but extremism, radicalization, and religion do not need to go together (de Bruijn 2018).

Terrorism, in the form of radicalization and extremism, is a social construct. Something that is an act of terror for one person can be a legitimate act of political violence or resistance for another (Turk 2004).[2] Therefore, we define terrorism as a specific form of political violence that is experienced as an act of terror, which means that it does not need to be inspired by religious ideas but can have a secular and political background as well. For example, World War I was triggered by the assassination of Crown Prince Franz Ferdinand in Sarajevo by a radical anarchist. Europe and other places in the world have known various episodes of right- and left-wing extremism and terrorism over the past decades, such as the Rote Armée Fraction in Germany, Red Brigades in Italy, Maoist uprisings in Nepal and India, and right-wing terrorism in the United States, and various other countries. At present, the danger seems to come from Muslim extremists, but right-wing extremism is also on the rise—for example, in Western democracies.

Extremism and violent religious movements are therefore not born necessarily from a foreign threat but arise in a particular political and historical context. Why in this particular era we witness violent extremism in drylands may have connections with certain contemporary characteristics of drylands and the geopolitical context in which these drylands find themselves. Many of the drylands where Muslim extremism develops are what were labelled 'remote rural areas' (Goodhand 2003), in general areas that are little connected with the centres of political power, have comparatively low levels of income, experience high levels of food insecurity, and are plagued by violent conflict. Some of these areas are also among the highest in terms of child mortality and fertility (Black et al. 2003; Golding et al. 2017). Yet some countries, such as in the western Sahel, have been relatively calm over the past decades. Why then do we witness the emergence of violent Muslim extremism in this region at present?

The roots of Muslim jihads

Contemporary Muslim extremist movements claim to engage in jihad to install a Muslim caliphate. However, there are important differences between historical and contemporary jihads. Historically, Muslim jihads seem to have a strong connection with drylands. The early jihads after the foundation of Islam were staged in the Arabic peninsula and spread later on in what is now called the

Middle East and the North African Maghreb. Over time, Islam spread over the world through trade routes and, at times, warfare of Muslim emirates with non-Muslim states and rulers, particularly in the era of the Crusades and the rise of the Ottoman empire. Other, more recent examples are the Fulani jihads in Sahelian West Africa in the 19th century (Burnham and Last 1994) and the Mahdi state in Sudan (Dekmejian and Wyszomirski 1972). These jihads were also projects of state-making and empire-building, were characterized by what we could term 'regular warfare' and the following of mainstream Sunni doctrine, and did not show the contemporary link with extremist ideologies and terrorist violence.

Following the hypothesis that contemporary jihadism is primarily an insurgency against dominant powers, why then did these contemporary jihadist movements emerge in the present and not during colonialism, a typical situation of external domination of Muslim populations? In the first place, the colonial authorities usually did not intervene in the way in which the inhabitants of drylands practised religion, but they were on the alert to prevent millenarian movements from emerging and closely watched influential Muslim preachers, in order to prevent unrest (Brenner 1984). The second strategy was to incorporate Muslim emirates and Muslim elites into the colonial administration, such as through indirect rule under the British as in the Sudan and Nigeria (see for example Reynolds 2001), or to give them roles such as tax collectors, as under French colonialism, so that they had access to some of the spoils of the colonial administration (de Bruijn and van Dijk 1995). In the Soviet Union, Islamism played a negligible role in resistance against the Communist regime. Only after the dissolution of the Communist regime and the independence of the Central Asian states did Islam re-emerge as a political and social factor of importance (Akiner 2003; Montgomery and Heathershaw 2016).

A major difference between historical and contemporary jihadists is that the latter break with mainstream Sunni traditions and rules as to how a jihad should be conducted (Thurston 2020: 1)—for example, in the way they deal with adversaries, terrorist attacks, and suicide bombings. Muslims in the colonial era usually adhered to relatively moderate Sunni brotherhoods. Contemporary Muslim extremists primarily derive their ideology from the Wahhabi Salafist thinking that emerged in 18th century Saudi Arabia after Cheick Wahabi, who first formulated the particular doctrine of Salafist thinking (Cook 1992). Its popularity increased with the independence of Saudi Arabia, and it gained real momentum after Saudi Arabia actively started to spread Wahhabi doctrine following the Shi'a revolution in Iran in 1979, to counter the influence of the Shi'a doctrine in countries surrounding Iran (Ghattas 2020). Another factor was the Saudi support for refugees from Afghanistan after the Soviet invasion, refugees who were establishing madrassas in northwest Pakistan and whose followers later came to be known as the Taliban. With their enormous wealth from the revenues of oil production, the Saudis were responsible for the vast spread of a Salafi interpretation of the Muslim faith, though they never officially promoted violence (Ghattas 2020).[3]

In contrast to conventional jihads, contemporary Muslim extremists seem to engage in new forms of (asymmetric) warfare and are not primarily focused on

promoting geo-strategic interests such as the expansion of state and empire. They often engage in extreme forms of violence against innocent civilians, which is a deviation from traditional Sunni doctrine. Most movements start as insurrections against state power and foreign military interventions and organize as guerrilla movements. In addition, they engage in all kinds of other activities, such as trade, smuggling, and kidnapping to finance their activities (see for example Bøås 2015). Typically, these movements emerge in areas where state authority is weak, such as in the aftermath of the 2003 invasion of Iraq, in remote areas in Afghanistan and Pakistan, in Somalia, and in the Sahara and Sahel of West Africa. Often these areas were labelled as 'ungoverned spaces'—drylands as empty holes in the security system—where state control is absent or ceded to non-state actors and where terrorists can breed and proliferate and organize to overthrow legitimate governments (Clunan and Trinkunas 2010: 17). Yet, these spaces, despite the absence of the state, are not devoid of governance structures and administrative institutions; rather, other actors step in and provide non-state forms of governance and security services (Boege et al. 2009; Clunan and Trinkunas 2010).

In explaining the rise of jihadism in drylands, the preaching of Salafist doctrine is often put forward as an explanation. In part, this explanation provides the ideological fuel to justify a securitizing approach and military interventions and counter-insurgency policies aimed at defeating the movements on the battlefield. The preaching of Salafist thinking, however, can never be the only cause or reason for the emergence of Muslim jihadism. The emergence of the Taliban was as much a popular reaction against the Soviet invasion and later against an unwanted and corrupt regime, as it was an organization that depended on the ideological fuel preached in the madrassas in the frontier areas of Pakistan provided by the Saudis and on the weapons supplied by the US government to help them chase away the Soviets. Likewise, in other areas, there is always a basis of local grievances and issues that contribute to the emergence of extremist groups.

Jihadism is also often associated with the particularities of so-called tribal forms of social and political organization through segmentary lineage systems that defy unitary political systems and are fundamentally opposed to the rule of states. It is true that many of the areas where we find extremist groups and Muslim jihadism are tribal areas ruled by customary law blended with Sharia law.[4] The areas where the Taliban emerged in Afghanistan and northwest Pakistan were tribal in nature, traditionally opposed to the central rule, and never fully controlled by the Afghani government or British colonial power. The areas where ISIS emerged in Syria and western Iraq are also tribal in nature. Somalia, the homeland of Al-Shabaab, though inhabited by a single ethnic group is organized in numerous clans, which can be considered as sub-tribes of the Somali. In West Africa, jihadism is dominated by Tuareg and Fulani who live dispersed over several countries and are also known for their segmentary tribal organization.

Nevertheless, the connection between tribes and extremism and jihadism is not automatic or even logical. Tribal politics is centred on segmentary agnatic lineages, which are centred on themselves and the defence of the resources they need for their survival (Roy 2017). Thus, tribal political dynamics primarily tend

towards fragmentation rather than unification and unified leadership. A case that confirms this reasoning, for example, is the failure of Al-Qaida to take root in Somalia, because Al-Qaida was unable to deal with the segmentary politics of the Somali clans (Menkhaus and Shapiro 2010). We also see that many of the jihadist movements (and rebellions in drylands in general) tend towards fragmentation because of internal political logics.[5]

These examples also show that extremist movements and jihadist insurrections cannot be organized in a top-down manner. Despite the fact that jihadists reject existing political orders, they also have to engage in what Thurston (2020: 9) labels 'shari'a politics', the making of a new political order based on the way in which the jihadists engage with Islamic theology and the degree to which they impose this theology on local populations. They have to engage with the local context and population to survive, and therefore they have to descend from their global universalist theological message and engage in meso- and micro-level politics in order to take root and deliver political goods to the population they appeal to (Thurston 2020). In engaging in shari'a politics, they have to balance internal vertical tensions between the commanders and the combatants, and internal horizontal tensions between different factions at local level. In short, this means that in order to be able to pursue their goals, they need to engage with local societies, eventually becoming involved in other forms of mobilization, such as in ethno-nationalist and economic messages (ibid.).

However, the fragmentary nature of politics in tribal societies is at the same time an explanation for the importance of extremist and jihadist ideology, because this ideology may be the key element that holds these movements together—given that the extremist ideology acts as a moral framework to counter the fragmentary tendencies in tribal political organization (Bøås 2015). Another case to illustrate this point is the Naxalite rebellion in Central India, a rebellion that draws on a plethora of ethnic minorities held together by a Maoist ideology (Kennedy and Purushotham 2012). Salafist ideology also provides jihadists with a global connection.[6] This connection is not only ideological, but can be also very practical because it enables these tribal groups to connect with global partners and networks that can provide them with knowledge, money, weapons, and training facilities (Roy 2017).

Blaming the emergence of Muslim extremism on agitation and preaching by proponents of Salafism is insufficient. Though the jihadist message provides the ideological fuel for people to rise up against the state (and against 'the West'), this message resonates on a bedrock of discontent and food insecurity, and out of the feeling of injustice and neglect. It is significant that most of the jihadist movements have emerged in so-called remote rural areas, areas that have been plagued for decades by a combination of poverty, food insecurity, economic, and political marginalization, and the absence of basic public services such as health care, education, and reliable security services, and also often plagued by violence and political instability labelled 'complex emergencies' (Goodhand 2003; Keen 2008). In these areas, Muslim intellectuals are able to find fertile soil for their message of salvation and their strong appeal for social and political justice.

Therefore, we also cannot understand these wars as conventional wars, because they are asymmetric in character, are often discontinuous or protracted (Richards 2005), and are not only political but can be about other economic and ideological interests (Duffield 2001; Mello 2010). Yet the religious dimension of these so-called new wars has not yet received much attention.

In the following sections, we will first sketch the emergence of Muslim jihadism in the Sahel as a case to illustrate that its emergence is not only about religious ideology but also about local social and political issues. We will explore events in the western Sahel to see how extremist organizations changed from being terrorist movements into rural insurgencies, in their attempts to adapt to the local context and address local political issues. It is outside the scope of this chapter to recount in detail the entire story of jihadism in the western Sahel, its diverse factions, and leadership changes because all parts of the region have their own dynamics and their own peculiarities. For want of space, we will stick to general trends and turning points.

Political instability in the western Sahel and the emergence of Muslim jihadism

The context of the western Sahel

The Western Sahel, defined here as Mauretania, Mali, Burkina Faso, and Niger, is one of the poorest areas of the world. On the global map of human development, it is among the most deprived regions of the world.[7] These former French colonies gained independence in 1960 and inherited weak government systems, with a largely illiterate population and poorly developed economies. Positioned within and just south of the Sahara and on very old geological formations, the agricultural potential was extremely limited because of erratic rainfall and poor soils. Still, with a low urbanization rate, 90% of the population depended on agriculture. Most of the population lived below the poverty line. The large majority of the sedentary population subsisted on the cultivation of dryland cereals, such as millet and sorghum, with a substantial minority engaged in nomadic pastoralism.

A decade after independence the region was hard hit by recurring droughts (-1968–1973, 1983–1985), which caused large-scale famine and extensive economic damage. As a result, many people moved from dry areas to more humid parts of the country and even beyond towards the coastal states. Despite large-scale development investments, poverty and food insecurity are still rampant, with 80% of the rural population living below the poverty line. On all other socioeconomic indicators (malnutrition rates, maternal and infant mortality, literacy rates, life expectancy), the countries of the western Sahel, and especially the rural areas, are at the bottom end of the world rankings. Only one indicator is the highest in the world and that is the fertility rate, making the populations of the regions the fastest-growing in the world, despite the dismal living conditions (Hilderink et al. 2012).

The roots of marginalization (1960–1998)

Muslim extremism in the Sahel cannot be isolated from the wider tendencies towards political instability, which were manifest at least a decade before the emergence of Boko Haram and other Muslim extremist groups in the region. In Nigeria, for example, intercommunity violence on an ethnic and religious basis, vigilantes, and organized crime (Meagher 2012) were major factors structuring the political landscape and gradually undermining the social fabric. All over the Sahel, Nigeria included, farmer–herder conflicts were frequent and caused many casualties (Hussein, Sumberg and Seddon 1999; de Bruijn and van Dijk 2005; Soeters et al. 2017). Over time these conflicts increased in severity, as pastoralists moved from the Sahel and Sahara to the greener pastures in the southern Sahel and Sudan zone.[8] Although these population movements started already under colonialism and in the early 1960s, they gained pace after the droughts of the 1970s and 1980s (de Bruijn and van Dijk 2003). However, conflicts in the past remained limited in scope (de Bruijn and van Dijk 2005).

From a national political point of view, the western Sahel has been relatively calm since independence, compared with the Chad Basin, where repeated rebellions and Libyan incursions were a constant source of instability, and the Sudan, which was plagued by long episodes of civil war in the centre, south, and east of the country. Although there were various Tuareg rebellions in the Sahara (-1962–1963, 1990–1996, 2006) and various coup d'états in Niger, Mali, and Burkina Faso, these never touched the core of the state or led to long-term instability or civil war. Instead, in Burkina Faso, President Blaise Compaoré ruled for 23 years after ousting his comrade-in-arms Thomas Sankara, and Mali was known as a beacon of the democratic rule until 2012, after dictator Moussa Traoré was toppled by an army coup in 1991.

However, these Saharan Tuareg rebellions did lead to a political and cultural divide between the southern populations, the state, and the Tuareg, and to a deep cleavage between northern populations of nomadic pastoralists (Arab, Tuareg) and the Fulani pastoralists who were the dominant group in the Sahel zone. The latter were among the prime victims of Tuareg raiding and even organized their militias in collaboration with sedentary populations to oppose the desert nomads. Thus, the pastoral populations of the Malian Sahel were far from united. Although the 1990–1996 Tuareg rebellion was militarily a success, it failed because the united front fell apart into four factions because of rivalry between the Ifoghas, Imrad, Daoussahaq, and Arabs (Lecocq 2010). Opposition against the government among the Fulani never developed, as the Fulani elites always maintained cordial relations with the regime in place and together profited from the exploitation of the poorer sections of society (de Bruijn and van Dijk 1995; Benjaminsen and Ba 2019).

Following the earlier rebellions, the Malian government in particular decided to grant the Tuareg more autonomy in 1992 and decrease its involvement in the north of the country. This move to decentralization, however, did little to improve the position of the poor and subordinate classes in Tuareg society, as the

new wealth and incoming development funds were monopolized by the traditional elites. In addition, this created ample opportunity for all kinds of non-state actors to develop illicit activities and their own forms of authority, with power concentrated in a number of families and clans (Bøås 2015).

Although attempts to spread Salafist thinking also extended to the African continent over time, Salafism never gained much visible influence in the western Sahel during this period, as most Muslims adhered to the teachings of the Sunni brotherhoods and were deeply suspicious of those who chose to adhere to Wahhabi interpretations of Islam brought back from the pilgrimage to Mecca.[9] In Mali, for example, the Saudis supported the building of Wahhabi mosques and Quranic schools and supported Muslim scholars and NGOs in spreading the Salafist doctrine and development interventions (see Amselle 1985). Although the spread of Wahhabi thinking was ongoing since the early 1960s, Salafism never had a massive following among the population. A major turning point was 1979 and the emerging competition with rival Shi'a Iran over control of the Muslim world. Since then, Africa was also regarded as an area of competition and has become a battleground between Salafi and Shi'a networks competing for the hearts and minds of African Muslims, not only in the Sahara and Sahel where Islam has a long history, but also in the coastal states such as Ghana and Nigeria.

Early years and establishment of jihadist movements (1998–2011)

Muslim jihadism, however, did not originate in the Salafist preaching, which was present in mosques in urban centres and small villages, but came from the north. The military roots of the jihadist movements in the Sahara and Sahel are located in Algeria in the civil war that started in the 1990s (Thurston 2020). This insurrection against the government was led by the GIA (Groupe Islamique Armé), which lost legitimacy over time because of its excessive violence against the civilian population. In the years 1995–1999, the GIA slowly disintegrated and one of the breakaway groups, the Groupe Salafiste pour la Prière et le Combat (GSPC), retreated into the Sahara in the early 2000s, also under military pressure from the Algerian army (Thurston 2020). These groups subsequently drifted into the Malian and Mauritanian parts of the Sahara.

In northern Mali, they found a favourable environment to survive. Since the Tuareg rebellion of 1990–1996, the government had embarked upon a decentralization programme, which meant in practice that the Saharan regions in northern Mali were largely left on their own and enjoyed a kind of self-rule (Bøås 2015; Thurston 2020). The area was deliberately abandoned and military presence was very limited after 2001–2002 (Thurston 2020) when president Amadou Toumani Touré took power. There were few investments in the region, since the government concentrated on the capital and donors preferred to invest in economic activity in the south. As a result, a system of governance emerged that was labelled 'heterarchy' by Hüsken and Klute (2015) to denote parallel systems of governance in which it was easy to establish network connections between traders, smugglers,

jihadists, local leaders, politicians, and even the capital (Bøås 2015; Hüsken and Klute 2015).

In this context, these foreign Muslim jihadist groups managed to thrive and set up local networks, even though they were coming from outside. Their leaders married local women to forge alliances with local groups of Tuareg and Arabs. They also managed to set up their commercial networks and a kidnapping 'industry' connected with the highest government levels to negotiate ransoms with foreign powers. Yet, there was no logical social and political basis for a jihadist movement on a Salafist basis, uniting fighters from all population groups. There were deep divisions within these communities themselves. For example, these hybrid extremist movements were operating in the same environment and in competition with all kinds of Tuareg nationalist movements (which also diverted attention from their presence) that were largely uncontrolled by the government.[10]

Despite the fact that they managed to survive and also achieved success, internal rivalries increased (Thurston 2020). This resulted in an east–west division with one of the commanders, Abu Zayd, taking the western wing and the other, Mokhtar Belmokhtar, commanding the eastern wing. Around 2007, the GSPC rebranded itself (and became even more autonomous) as Al-Qa'ida in the Islamic Maghreb (AQIM) (Boeke 2016; Thurston 2020). Again in 2011, another breakaway group was formed, the Movement pour l'Unité et le Jihad en Afrique de l'Ouest (MUJAO), because of internal disagreement over the regional ambitions of AQIM (Thurston 2020: 84–86).

The rise to a proto-state and evolution into a rural insurgency (2011–2015)

This apparent equilibrium changed around 2011 with the fall of Khadafi and the return of numerous Tuareg from his Islamic legion to Mali and Niger, who started a (secular) rebellion under the label of MNLA (Mouvement National pour la Libération de l'Azawad) in Mali in their bid to establish a Tuareg state, called Azawad. Soon, rivalries started between the jihadist movements and the MNLA fighters, and the latter were overrun by the extremist groups, who were much better organized and also attracted a large number of fighters from MNLA. The regular Malian army was too disorganized and weak to prevent the takeover of the entire north and centre of Mali by the victorious jihadists.

At this point in time, the extremist movements were effectively controlling the four northern regions of Mali and began to implant themselves at local level. They soon implemented a host of measures to restructure society and economic life, and their influence was felt down to the lowest levels of society in north and central Mali. After a coup d'état in Mali by discontented army officers, because of the lack of support by the government and the subsequent restoration of civil government, the leadership of AQIM thought it was time to move towards the south. This appeared somewhat overconfident because the provisional government requested a French intervention. From January 2013 onwards, the French army intervened and swept the jihadist movements from the centre and north

to restore order (see Boeke and Schuurman 2015). The extremist movements retreated to the countryside and abandoned the cities (ICG 2013). This led to a (partial) return of state authority in both north and central Mali. However, this return was deeply resented by the population, because state officials fell back into old habits of exploiting the population. In addition, many people were accused of being complicit with the extremists and, even worse, specific population groups (Tuareg, Fulani) were targeted by the authorities and also underwent what has been labelled 'collective punishment' (Thurston 2020). At the same time, many local people were under pressure of the remnants of the extremist movements still present in the countryside.

Although the international community stepped in with a number of initiatives, this did not help to restore order. To maintain peace, the UN fielded a peace-keeping operation (MINUSMA: Mission multidimensionnelle intégrée des Nations unies pour la stabilization au Mali; 13,800 strong), and the five Sahelian countries fielded a joint operational force under the label G-5 Sahel that collaborated with anti-terrorist operations by the French army (Opération Barkhane; 5,100 troops) to execute counter-insurgency operations. Despite all this effort, large areas in the Sahel remained outside the control of the state and were slowly taken over by all kinds of non-state armed groups. Because of the targeting of innocent villagers during these military actions, these counter-insurgency operations only helped to shore up more support for the jihadists and increase the level of violence.

The entire western Sahel affected (2015–present)

A major new development is that for the first time since the colonial conquest and the Independence period, the Fulani become involved in an insurgency against the state. The year 2015 can be regarded as a turning point in the situation in central Mali, because now the conflict moved from the north to the centre of the country, as local Fulani started to organize their own security in the form of youth militias. Initially, they did so in a peaceful manner, even asked the support of MINUSMA officials, and also contacted foreign delegations to ask to be protected. However, these organizations were unable to field sufficient military and civil presence to prevent further deterioration of the security situation.

Fulani herders were targeted by security forces also at the instigation of their political elites, as they accused some of their constituency of having joined MUJAO in the years 2012–2013 (Sangaré 2016). Fulani herders also felt vulnerable vis-à-vis sedentary population groups who felt empowered by the return of the government. This feeling was reinforced by the fact that they had lost already vast areas of grazing to expanding agriculture over the past decades (Gallais 1975; de Bruijn and van Dijk 1995; Thibaud 2006; Nijenhuis 2013) and to chiefs who covertly privatized pasture areas with the help of pasture management interventions initiated by development operations (Gallais 1984); the herders were also victims of abusive practices from their own elites, the authorities in matters of conflicts over water and pastures (Benjaminsen and Ba 2019; Jourde et al. 2019).

In short, disappointed by the lack of attention of the international community and the lack of protection from the national army, MINUSMA, and their own political elites, Fulani herders became an easy prey for recruitment by the jihadist groups that were increasingly present in the countryside (Sangaré 2016). In this context, the preaching of a Fulani cleric, Amadou Koufa,[11] fell into fertile soil among marginalized pastoralists. His sermons also referred to important issues for nomadic pastoralists, such as that pastures are a gift of Allah and should be free for all and not a private property, which is a direct reference to the exploitative practices of Fulani chiefs who were privatizing pastures and asking high fees for access to pastures in the Inner Delta of the Niger (Jourde et al. 2019: 5; Thurston 2020). Amadou Koufa even called for internationalization of these Fulani interests, as they are spread all over the Sahelian zone (Jourde et al. 2019; Thurston 2020: 149–156).

This mixture of jihadist and ethno-nationalist mobilization is taking place all over the western Sahel. When the French chased away the jihadists movements from central Mali in 2013, many of them retreated into northern Burkina Faso, where in due course a separate branch emerged under the leadership of Malam Ibrahim Dicko. In the Inner Delta of the Niger, Fulani started to join proto groups of jihadists organized under the banner of Katiba Macina, in reference to the Muslim-Fulani empire Macina that dominated the region from 1818 to 1862. Towards the east, a group emerged called Katiba Serma, after a large cattle camp on the Seeno plain south of Boni, which was first the site of negotiations between Fulani herders and MINUSMA but subsequently became the centre of resistance and recruitment of young herdsmen by the jihadist groups. In Niger, Fulani were targeted by Tuareg and Daoussahaq militias loyal to the Malian government in an inter-ethnic conflict about pastures. The Fulani subsequently connected with networks of ISIS in the region in an attempt to create security for themselves.

Regular armies proved hardly capable of fending off jihadist attacks and experienced heavy losses over the years 2019–2021. The resulting power vacuum left space for self-defence militias originating in other sedentary ethnic groups—such as the Dogon, Mossi, and Bambara (Hagberg et al. 2019; Benjaminsen and Ba 2021)—to step in, leading to an increase in the level of violence and massacres against innocent civilians and a vicious cycle of violence among jihadists, army, and self-defence militias. In Mali, sedentary ethnic groups increasingly started to mobilize their own traditional hunting groups, the Donsos, officially guardians of the bush and hunting resources but increasingly mobilized for the defence of territory[12] and the protection of villagers against jihadists, as the regular army failed to exert effective control over the countryside. These groups of Donsos increasingly operated as proxies of the army with the consent of the government. As a result, a number of attacks on Fulani villages with innocent civilians were organized that resulted in hundreds of casualties (Benjaminsen and Ba 2021). In neighbouring Burkina Faso, these self-defence militias also emerged (Hagberg et al. 2019). A similar scenario is developing in Niger after bloody jihadist attacks on sedentary villages (ICG 2021).

The French operations targeted mainly jihadist groups and their leaders in an attempt to eliminate the leaders. Despite the fact that they managed to eliminate several leaders and jihadist bases, they have not been successful in reducing the level of violence and increasing control over territory. G5-Sahel forces and regular armies also staged their own counter-insurgency operations, which have encountered widespread criticism because of the human rights violations and summary executions that have taken place. There are also indications that small groups of jihadist fighters are spreading themselves over other areas, more to the south of Mali and Burkina Faso, and may also have infiltrated in Ghana, Côte d'Ivoire, and Benin.

In short, a military solution is out of sight, and what started as small groups of extremists and terrorists in the Sahara has now become a widespread religious insurgency (and non-state armed groups acting as a counter-insurgency) that has its roots in marginal rural areas with discontented populations.

Discussion: the need for different layers of explanation and context

When looking at the question whether drylands are the breeding grounds for extremist groups and jihadism, and taking into account the emergence of jihadism in the western Sahel, it is clear that an extremist ideology in the form of Salafist Islam is only one reason for the emergence of a powerful jihadist movement linked to Al-Qaida.[13] The jihadist uprising (and the rise of ethnicity-based self-defence militias for that matter) has a much more complex background than just agitation by Salafists. Although Salafist ideology has been able to gain ground in an extremely complicated political and economic situation, it had already been present in the region for decades and never gained much popularity among the populations now recruited to jihadist groups. Even in 2015, people forming local self-defence militias did not have much appetite to join jihadist groups (Sangaré 2016). However, over time, as these groups came under pressure by government forces, they increasingly entered into the orbit of the jihadist groups, who in the end joined forces under the banner of JNIM.

As others have also observed (Boeke 2016; Sangaré 2016; Cissé 2018; Thurston 2020), an important factor for the Fulani to join forces with the jihadists and to overcome their traditional enmity with the Saharan Tuareg was the insertion of local issues into the message of preachers such as Amadou Koufa and Malam Ibrahim Dicko, who denounce the predatory practices of government officials and their own elites and evoke the loss of living space and pastures due to the expansion of farming and limitations on movement. These frustrations and grievances were mainly channelled by marginalized youth, but this does not mean that the older generations do not share these grievances. They faced the same set of exploitative practices when they were young (see Gallais 1984; de Bruijn and van Dijk 1999). This message of social and political justice is extremely powerful in a situation where people are pushed to the brink of their existence through a combination of harsh environmental conditions, loss of access to resources, and exploitation by government and elites.

As a result, what started as a jihadist or extremist insurgency, has increasingly developed into a popular insurgency that has a strong basis among rural populations, who see jihadists and their message as a real alternative to the national government. This is not because local people are favourably disposed to extremist Islamism, but because of very complex issues and conflicts related to the management of natural resources, governance relations, and political exclusion (Benjaminsen and Ba 2021)

Lessons for the drylands from the Sahel

What can we learn from the situation in the western Sahel for other situations in drylands, in terms of susceptibility towards a descent into political instability and the emergence of extremist movements?

First of all, many jihadist movements originate in areas that are left on their own by their governments in terms of investments in public services and infrastructure. There are no known extremist insurrections in urban areas that were able to hold out for so long. As Thurston (2020: 194) observed, Sahelian states are focused on capitals while the peripheries are sometimes inaccessible for part of the year.[14] In many cases, these rural peripheries are extremely poor and have high levels of malnutrition and child mortality. This is equally true for the remote areas in Afghanistan, Somalia, and northern Mozambique, which have not seen improvements in public services and living conditions. After 20 years of foreign interventions, the rural peripheries of Afghanistan still do not have access to basic health care, education, and clean water and sanitation.

However, poverty and food insecurity are not necessary conditions for the emergence of extremism. As we see in the case of the Sahel, Salafist thinking is introduced from outside through peaceful means, NGOs, and the training of preachers and others at the bottom level, and through the infiltration of terrorist groups from outside, veterans from the Afghan war, and the Algerian civil war at the top level. In the course of the evolution of these movements, the two levels came together and formed a loose coalition with quasi-independent, almost ethnicity-based decentralized fighting units (Katiba Macina, Katiba Serma) under a central Al-Qaida or ISIS command, combining a unifying ideology with a complementary message with respect to local issues. This combination of Salafist ideology with local issues is particularly powerful, as it carries a message of justice and opposes itself to corrupt secular governments and customary elites who have exploited these populations for decades. Initially, the proto-jihadists were mainly addressing local Fulani leadership issues and state authorities (also by violent means), blaming them for injustice and exploitation.

Another element that promoted the growth of jihadism in this particular area was the presence of a large reservoir of rural youth who do not have good perspectives for their future. These future prospects, however, are not exclusively related to the meagre availability of natural resources in drylands, but perhaps even more to relations of patronage and exploitation (de Bruijn and van Dijk 1995; Jourde et al. 2019) and the skewed distribution of income. As much as the messages of the jihadists appeal to the idea of a pure Muslim emirate, they also call for what

they, as pastoralists, need most: free and unhindered access to pastures and water, as a pastoralist ideal (Cissé 2018).

Therefore, the current responses to extremism in the form of securitization and military interventions are counterproductive and will only serve as a further catalyst for further radicalization of youth and the deterioration of trust between communities and ethnic groups. Instead, productive employment, basic public services, and decent and inclusive government are the keys to providing solutions for violent conflicts and extremist rebellions. In addition, thorny issues with respect to natural resource management regimes and relations between mobile pastoralists and expanding farming communities will have to be addressed as one of the stakes in inter-ethnic violence. These have been on the agenda for decades but have been left unsolved, not only by customary and state authorities—who rather profited from conflicts—but also by civil society and NGOs.

Lastly, specific attention should be given to youth. Deprivation, relative or otherwise, is among the most often cited factors for recruitment to extremist groups. Yet not all recruitment is voluntary, and there are also peer pressure and collective action variables involved. As Debos (2011) argued, membership of armed groups can also be a mode of existence. In the tribal logic, people take up arms to fend for their communities and defend the resources on which these communities depend. At the same time, tribal societies are not democracies either. Often youth are at the bottom end of paternalistic structures in which they are dependent on elders, chiefs, and so on to have access to land, to marry women and start families, and to build their own livelihoods. As Chauveau and Richards (2008) argued, these factors play a prominent role in youth's anger and propensity to join armed groups.

Conclusion: extremism as a rebellion of the rural periphery?

Extremism and jihadism can thrive only when they are connected with local issues and grievances. In order to survive, extremist organizations have to embed locally and make connections with local populations and local political and economic issues. It seems that rural peripheries, such as the Sahel, which have been abandoned by their governments and are characterized by poverty, food insecurity, a young population, and are in general politically marginal, provide fertile breeding grounds for extremism. Extremism therefore can be better understood as a rebellion from the rural periphery against urban dominance, an expression of grievance and a cry for more economic and social justice, rather than as a reactionary turn to fundamentalism and Salafist ideology. These insurgencies should consequently not be treated only as security issues, but also as social, economic, and political issues.

Notes

1 Laurie and Shaw (2018: 8) write: '[V]iolent conditions are not the property of individuals or monolithic structures: they are the existential climates by which localized subjects and worlds condense into being'.
2 The label 'terrorism' or 'terrorist' is these days frequently used to discredit more or less regular political resistance and formulate a 'legitimate' reason to silence opposition.

3 A good introduction to Salafist ideology is the book 'Salafi-Jihadism: The history of an idea' (Maher 2016).
4 Tribal is a contested term, as it originates in the colonial literature. The modern literature refers mainly to ethnicity and ethnic groups. Tribal here refers to a customary social and political organization on the basis of (segmentary) lineages.
5 Examples are the Tuareg insurrection in Mali and Niger from 1990 to 1996, which controlled pretty much of the Saharan parts of these countries, until the movement fell apart in 4 factions. Another example is the fragmentation of the SLA (Sudanese Liberation Army) opposing the Sudanese government in Darfur and the constant shifts in coalitions characterizing rebellions in Chad (Debos 2011).
6 The same would be true of course for the Naxalites and their connection with Maoist ideology.
7 See https://globaldatalab.org/shdi/maps/shdi/ [Accessed 28 February 2022].
8 Southern Mali, Benin, southwest Burkina Faso, northern Ghana, and Côte d'Ivoire (Bassett 1994; de Bruijn and van Dijk 2003; Soeters, Weesie and Zoomers 2017).
9 For example, in the early 1990s mosques would not allow Wahhabi Muslims to pray in their own way (arms crossed in front and not hanging at the sides), and they were forced to build their own prayer houses.
10 This is not entirely true, because the Americans were running several security initiatives in the Sahel and Sahara as part of the 'war on terror'. This was the Pan-Sahel initiative, an American effort to assist Mali, Niger, Chad, and Mauritania in detecting and responding to suspicious movement of people and goods across and within their borders through training, equipment, and cooperation (Ellis 2004). This operation was followed in 2005 by the Trans-Sahara Counter Terrorism Initiative, which was better funded and broader in scope. The precise history and impact of these operations still need to be evaluated, and apparently these operations did little to stop the advance of Muslim extremist groups.
11 Amadou Koufa, born in the early 1960s, has had a remarkable career, ranging from Quranic student (*talibé*) to popular singer and moderate preacher, he became a Salafist in the early 2000s—inspired by the Dawa Tabligh (of Pakistani origin)—and declared the jihad in 2012 when he joined Iyad Ag Ghali's Ansar Dine movement (Cissé 2018), a sister organization of AQIM (Boeke 2016). Ansar Dine later became part of an umbrella organization JNIM (Jamaat Nusratul Islam wal-Muslimin), uniting the four jihadist movements linked to Al-Qaida in the region.
12 Similar roles of hunting societies have been reported in the civil war in Sierra Leone (see Chauveau and Richards 2008)
13 For want of space, we will not discuss the emergence of ISIS and the internal fighting between ISIS-affiliated groups and Al-Qaida-related groups.
14 As an illustration, for example, there are the decentralized HDI maps, where the Sahelian capitals enjoy significantly higher levels of human development than the rural peripheries.

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10 Making cities in drylands

Migration, livelihoods, and policy

Nurit Hashimshony-Yaffe, Qian Zhang, and Ahmed Alhuseen

Introduction

Urbanization and migration are two major interlinked demographic features of the 21st century, with 90% of the increased urban population by 2050 projected to be in Africa and Asia (Mberu et al. 2017). Mounting empirical studies since the 1990s have focused on these two continents to disentangle the complex relationships between population dynamics, migration, urbanization patterns, and related socioeconomic changes (e.g. Awumbila 2017; Chan 2018). Drylands, often defined by their geographic indicators as arid and semi-arid lands (ASAL), cover about 41% of the Earth's land surface and are home to more than 2 billion people, 90% of them in developing countries and a significant share in Africa and Asia (Patriarca et al. 2019). However, dryland areas are rarely the focus of examination in the above-mentioned urban and migration studies.

ASAL have various ecosystems and physical terrains, but all have aridity in common and used to be inhabited by minority and ethnic groups. ASAL are traditionally associated with pastoralism, with its prevailing image of large land areas of scattered villages and low population density. Populations in ASAL have undergone tremendous change, where increased movements and exchanges have led to social heterogeneity and diversity. Throughout history urban centres were located at the margins of drylands and used to play an administrative role, sometimes offering social services and business space for pastoralists and farmers living scattered outside the towns. However, this known phenomenon has been changing its face, as has been noticed since the 1990s. Like cities elsewhere, cities in drylands have been expanding with rural–urban migration and the emergence of new livelihood opportunities in towns and their immediate surroundings (af Ornäs 1990; Baker 1990; Salih 1995; Agergaard et al. 2019), and also increasingly in connection to globalized production networks (Anderson et al. 2012).

Nowadays, climate change, globalization, and urbanization are co-shaping cities (Angelo and Wachsmuth 2020; Hughes et al. 2020). This calls for attention to cities located in vulnerable regions such as those of ASAL, where increasing climate disasters—including water shortage, drought, desertification, and land degradation (Middleton and Sternberg 2013)—have significant implications for food security, livelihoods, and the well-being of both their rural and urban populations.

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However, dryland cities have received much less attention compared with, for example, coastal cities. Meanwhile, in the emerging research field of environmental/climate migration, studies have suggested climate change effects and natural disasters are intertwined with increased tensions in resource use and even violent conflicts (van Baalen and Mobjörk 2017), seemingly driving people to cities (Burrows and Kinney 2016). An early tendency to stigmatize the affected people as 'climate refugees' while envisioning migration as a threat to the destinations (Myers 2002), despite still being heard in the media, has been critically questioned by studies that highlight the complex intersection of climatic force with economic, social, and political forces in shaping migration decisions and destinations (Black et al. 2011; Bettini 2013). The role of migration, from one type of livelihood strategy to a means of adaptation to climate change, and the associated uneven geographical implications have been addressed (Piguet et al. 2018). The debates continue on whether people are trapped or actively decide to move (Ayeb-Karlsson et al. 2018), and on whether their movements are significant for closer locations, especially cities, or more distant ones (Rigaud et al. 2018). A translocal approach has emerged, drawing our attention to the agency of migrants and challenging the urban–rural binaries and boundaries (Greiner and Sakdapolrak 2013a, 2013b). A good example to illustrate the complexity of the relationship between climate change, conflicts, and migration—and thus the implications for cities in drylands—is the ongoing Syrian civil war started in 2011 (Ide 2018; Abel et al. 2019); others will be provided in the two case studies of this chapter.

This chapter focuses on the less-known dryland cities, intending to explore two questions: (1) what forces are driving urban growth in drylands? (2) how does rural–urban migration contribute to the growth of dryland cities? The following section develops our conceptual framework, which draws on perspectives from livelihoods and translocal studies and centralizes human agency in (re)producing places and shaping relations between places through migration/mobilities. We follow the need for more empirical research and carefully interpret the contextual and embedded processes and mechanisms of migration to the city, to avoid feeding simplistic and alarmist discourses on climate change–migration relationships. Therefore, we present two case studies to examine cities as being simultaneously produced through migrants' bottom-up actions—see, in analogy, bottom-up initiatives in the governance of rural and urban commons (Haller et al. 2016; Colding et al. 2021; Pas et al.: Chapter 13, this volume); changing human–environment relationships; and shifting policy in ASAL. These two cases, from Sudan and Inner Mongolia (China), enable us to explore the commonalities and differences in urban growth in drylands.

The Khartoum State case study from Sudan will exemplify livelihood change in the city of Khartoum. This case shows how the city has become a city of pastoral nomads who partially continue their former pastoral and animal husbandry lifestyle; in other words, they have imported rural livelihoods into the urban setting. Furthermore, Khartoum has become an international juncture of migrants and a hub for relief industries and is highly influenced by the presence of both.

The second case study, in central Inner Mongolia in China, will explore urban expansion and transformation as being tightly linked both to the state's modernization and environmental protection goals, and pastoralists' livelihood strategies, perceptions of environmental change, and mobilities. While looking at two sequential state-led resettlement projects, this case will reflect on what dryland urban spaces mean for pastoralists and to what extent they contribute to the making of dryland cities, by analysing the varied socioeconomic outcomes of migration and the pastoralists' lived experiences in the city.

Based on these two case studies, the discussion will examine dryland cities as the outcome of migrants' activities in urban spaces and between rural and urban spaces and as non-linear circular movements while adopting different pathways to sustain their lives. We conclude that, when considering dryland cities, we need to look beyond the urban–rural dichotomy, as urban growth is nurtured by resources in the rural area through the mediation of migrants. While our studies show that dryland cities are following some general characteristics and development directions, their growth and dynamics are also shaped by particular environmental and geographical characteristics of the drylands, characteristics that are associated with rural migrants' more flexible and opportunistic but less settled relationships to the cities.

Agents of the changing dryland cities

In analysing the two cases, we adopt a people-oriented perspective, highlighting how the human agency of rural migrants makes themselves and their rural origins relevant and linked to urban spaces and contributes to the growth and transformation of the city. Urban spaces are socially constructed, and their (re)production requires permanent 'investments' of capital, labour, ideas, and time by actors; they are permanently in transformation, as they are places of interaction and shaped through people's everyday practices and their imaginations of what a city constitutes (Bork-Hüffer et al. 2016: 135). Using their agency, assets, and knowledge, migrants as mobile subjects nowadays are essential, heterogeneous agents in the (re)production of urban spaces in cities, while the sociopolitical and physical conditions of urban spaces frame their agency, opportunities, and livelihoods (Bork-Hüffer et al. 2016).

As mentioned, migration decision-making embodies complex processes where social, political, economic, and environmental forces intersect to shape the relationship between people and places (Black et al. 2011). Thus, migrant–urban relations are not simple, and urban transformations are shaped by the interaction between migration pathways and urban growth (Brøgger and Agergaard 2019). Furthermore, the translocal perspective highlights 'the emergence of multidirectional and overlapping networks that facilitate the circulation of people, resources, practices and ideas' (Greiner and Sakdapolrak 2013b: 375). Thus, a careful look at migration–urban relations ought to identify the existence of transformation in ways of life, looking beyond the binary imagination of rural–urban spaces and migration as voluntary or forced (e.g. Wilmsen and Wang 2015; Piguet et al. 2018; Bakewell

2021). We will follow Greiner and Sakdapolrak (2013a, b) and explore the multiple ways in which migration contributes to the making of a city, with attention to the multidimensional nature of migration. We will analyse migration as part of regional socioeconomic and institutional change (regarding mobility and tenure, as well as access issues), addressing the disparity between rural and urban areas, the concentration of employment opportunities, goods, and services in towns, the scarcity and seasonality of resources in rural areas, and rural migrants' potentially transformative agency by moving into towns while keeping their mobility as a lifestyle.

The city provides opportunities for trade, education, social services, jobs, and earnings (Anderson et al. 2012). It also provides opportunities to lean on community-based organizations and local knowledge that are now converging in the new urban space (Hashimshony-Yaffe and Mesghenna 2015). Migrants depend on existing and evolving social networks to get established and integrated into social and economic lives in the city, even if in some cases they are settled through government plan and support (e.g. refugee settlement). Significantly, migrants contribute with their circular movements to intensifying exchanges between, and networks across, rural–urban spaces. Livelihood strategies provide us such a lens to look into the exchanges, movements, and flows across spaces and between groups. The core of a livelihood approach highlights micro-perspectives and the agency of people in managing a range of complex possibilities of tangible and intangible assets (Chambers and Conway 1992). This acknowledges the importance of capabilities, assets, local knowledge, and activities as basic living requirements, especially for poor people for their present lives and futures. Nowadays, intersected social and climate change are increasing the precarity and uncertainty of livelihoods. Material conditions are shaped by how gender, generation, class, or ethnicity mediates access to material and cultural resources, with implications for the consequent choice of livelihood activities (Rao 2019).

In summary, in this study, we follow a human agency perspective that looks beyond the binaries of urban–rural and of voluntary–forced, highlights the differentiations required while looking at different populations of farmers and pastoralists, and focuses on the social–spatial interdependencies within the dynamics of migration/mobilities as mixed types of relationships take place.

Khartoum State in Sudan: a growing metropolis against a rural background[1]

Background

Khartoum State is a city growing at an accelerated rate. It is the capital of Sudan, which has an essentially agro-pastoral economic background, with more than 60% of the population being farmers and pastoralists. Throughout its development, Khartoum State has experienced waves of both forced and voluntary migration flows from rural areas to urban centres. While better job and educational opportunities are pull factors attracting rural–urban migration,

extreme poverty, natural disasters, and conflicts have also induced many rural people to migrate to nearby or distant cities. This case study seeks to describe and explain the dynamics of the urbanization process in Khartoum State and explores the impact on urban development being witnessed on the livelihoods and lifestyles of the rural migrants.

History

Tuti Island, which lies at the confluence of the White and Blue Nile rivers, is considered the origin of Khartoum State. The island was first inhabited in the 15th century by sheikhs (religious leaders) descended from the Mahas tribe (Nubian Nilotic tribe from the north of Sudan). In the 17th and 18th centuries, the sheikhs began to leave the island and established small farming villages in the surrounding towns (Khartoum, Khartoum North, and Omdurman), focusing on agriculture and the teaching of Islamic norms. During Turkish rule (1821–1885) and Condominium rule (British and Egyptian) (1898–1956), Khartoum was chosen as the capital, gradually becoming the main administrative, commercial, and religious centre, except for the short-lived Islamic state during the Mahdist rule (1885–1898), when Omdurman became the religious and administrative capital. After independence in 1956, Khartoum continued to be the capital of Sudan and the main commercial and cultural centre, Omdurman became a residential city, and Khartoum North became the main industrial and railway centre.

Historically, the precolonial Sudanese economy was predominantly based on traditional rain-fed subsistence farming and nomadic pastoralism. Sorghum and millet were two cereals crops and staple foods for the people of Sudan. Traditional irrigated agriculture was also practised on a small scale, using ancient water-pumping technologies such as the *shadouf* (a bucket tied to a pole as a lever, with a stone as a counterweight) and the *sagya* (water wheel). Based on local common-property institutions governing access to pastures and fisheries, nomadic and sedentary farmers kept livestock and engaged in very limited fishing, catching Nile perch from the rivers. Most of the catch and harvest was consumed locally, and the few surpluses were sold in small traditional markets. Forestry activities included the use of wood for fuel and charcoal and the collection of gum Arabic from acacia trees for commercial purposes. Irrigation by flooding was also practised, using the Nile flood system (FAO 2017).

In the early 1970s, the Sudanese economy began to follow a more open, free, and liberal path in response to the wave of globalization and as an attempt by successive Sudanese governments to integrate the country into the world market—that is, by reducing trade barriers and coordinating monetary and fiscal policies and hence also privatization policies. This economic and market transformation coincided with the increasing urbanization of the population in Greater Khartoum, largely as a result of internal displacement. However, since 1997 the Sudan economy has been under great strain from American sanctions. Throughout the years, more countries introduced sanctions, providing a wide-ranging shock to the economy. Tightening of sanctions resulted in a slowdown of trade; difficulties in

repatriating export proceeds, which reportedly weakened exports; and blocks on transferring payments, which adversely affected remittances. These sanctions and the loss of ties to the international banking system have had adverse economic and social impacts; the result is that poverty has worsened.

Various studies describe different factors influencing the development of Khartoum. The main causes of Khartoum's expansion were identified as migration and internal displacement as a result of violent conflicts and of land and commons-grabbing processes in other parts of the country, as well as natural population increases (Eltayeb 2003). Khartoum was the main hub that hosted the majority of internally displaced persons (IDPs) from the civil war (1955–2005) that led to the emergence of the independent South Sudan Republic in 2011. In addition, Khartoum State has absorbed most of the IDPs from the Darfur conflict, which erupted in 2003 between armed Sudanese pastoralists of Arab origin and the sedentary Sudanese smallholder farmers of African origin.

Khartoum has also received IDPs who were displaced by the drought that hit the east and west of the country in the 1970s and 1980s. Large numbers of refugees from neighbouring countries such as Ethiopia and Eritrea have made their way to Khartoum. Weaver (1985) estimated that Khartoum hosted over 1 million Ethiopian refugee families in 1984. According to Jacobsen (2008), IDPs in Khartoum make up between 18 and 23% of the population.

There was also a voluntary movement of smallholder farmers to urban centres in response to the changing environment. Khartoum has thus attracted many rural–urban migrants seeking better opportunities for study, work, and living conditions. As a result, agriculture and animal husbandry, which are the core livelihoods of Sudan's rural population, have been abandoned. The failed agricultural policies and the fluctuating rainfall (especially in the east of the country), the rigid debt repayment of the agricultural financing system, and the unsatisfactory selling prices of harvests have led to a steady deterioration in agricultural productivity, such that many farmers have abandoned farming and moved to neighbouring cities, often to Khartoum, to work in the informal sector.

Sudan's failure to develop the agricultural sector using revenues from the oil boom period (2000–2011) has meant that the country has missed the opportunity to build a solid foundation for sustainable economic transformation, and it has ultimately marginalized more farmers and pastoralists who have chosen to migrate, mainly to Khartoum and other major cities in the country. At the same time, this rural–urban migration is dominated by young men. It is projected that youth (under 18 years) will make up 60% of the urban population by 2030 and will represent the majority of the urban poor (UN-Habitat 2020).

Rural–urban migration impacts on livelihoods and income adaptation strategies

Khartoum State now has a population of nearly 8 million people, 45% of whom are 15–40 years old (CBS 2013). Rural–urban migration is continuously adding young people to the population of Khartoum, originally farmers and pastoralists,

who have decided to leave their villages and migrate to urban areas alone or with their families, in search of better opportunities as a strategy to diversify their incomes. However, the labour market in Khartoum is highly competitive, with a large supply of labour but limited opportunities—hence its ability to absorb the newly migrated people, especially those with low skills, has been low. As a result, many young migrants become self-employed in the informal economic sector, as street vendors, tea sellers, informal money changers, and so on, income-generating activities that require little or no education, thus adapting to the meagre employment opportunities in the public and private sectors. Ironically, rural–urban migrants attracted by the higher wages in the formal sector of urban centres usually end up in the low-paid informal sector, making them even more vulnerable to poverty.

The expansion of Khartoum's urbanized area has led to changes in food tastes and preferences. Dietary habits began to change dramatically as bread made from wheat flour largely replaced the staple sorghum and millet of the rural communities, leading to imbalances in food availability, affordability, and accessibility. This has led to an expansion of the food market and increased demand for high-value products such as vegetables, horticultural produce, poultry, fish, and dairy products. The changes in food tastes have turned bread and its prices into a trigger for political change, as evident in the December 2018 revolution that led to the ousting of the former regime after its 30 years in power. Parallel to this, the small traditional food markets that served as traditional collection points for household food needs have lost their place and importance in favour of supermarkets and shopping malls. In turn, this has increased commercial production in areas close to cities.

Although the total arable land in Khartoum State covers 1.8 million hectares, and abundant water is available from the Nile and its tributaries and ephemeral *khors* and *wadis* (dry river beds), only 37.8% of this water is used, and only 2.4% of the population works in agriculture and the livestock sector, making the share of agriculture in gross domestic production (GDP) very small compared with the quantity of available arable land and the potential of this sector. Although Khartoum has an unemployment rate of 20%, agriculture and livestock are not among the sectors that attract this surplus of young workers.

The Food and Agriculture Organization of the United Nations (FAO 2020) Special Report (FAO 2020) mentions that prices of locally produced sorghum and millet have increased in most markets in Khartoum since 2017's rising inflation, mainly due to high production and transportation costs and the devaluation of local currency.

On the other hand, rapid urbanization in Khartoum has limited the ability of families to secure their own food needs. Until the beginning of the 1990s, in some neighbourhoods it was common for families to still keep animals such as goats, chickens, and pigeons, which provided milk, eggs, and meat for household use or to be sold in the market and to meet the family's urgent needs. Thus, until the beginning of the 1990s, goats roaming in the streets of some neighbourhoods and the use of donkeys as means of transport were common scenes, especially

in third-class residential areas. According to Wilson (2018), the pastoralist lifestyle has historically been stigmatized in regard to some social, economic, and environmental problems, which has led to the marginalization of the pastoral sector. Therefore, the governmental policies adopted always favoured horizontal expansion of crop production at the expense of livestock production and pastoral livelihoods, and also the formulation of development policies without sufficient consideration of the aspirations of livestock owners and especially of poor producers. As a consequence, various government programmes have been issued, such as 'settle the nomads' and regulations prohibiting animal breeding within households in the urban centres, with negative drawbacks for the food security of Khartoum State residents.

The expansion of Khartoum's conurbation area has always been associated with disorganized, sometimes unauthorized, urban growth and multiethnic, or even in some cases multinational, urban slums and squatters. Also, urban growth has been strongly associated with urban poverty. As a result of the massive displacement and rural–urban migration, the annual demand for new housing is estimated at 8%, of which 75% is from new immigrants/IDPs (Elghazali 2006). To accommodate this increase in housing demand, recent residential plots have been expanded over arable and pasture lands, which has noticeably diminished the stock of productive arable lands. The recent master plan of Khartoum State envisions many affluent recreational and residential projects, which will further deplete more valuable arable lands that potentially produce food for the city dwellers and secure jobs for migrating farmers, leading in turn to further marginalization of the latter. In addition, the process of mass urbanization has imposed a class consciousness on traditional communities, in neighbouring villages encroached upon by urban expansion or migrants, and with IDPs who have recently moved to the cities—as manifested in lifestyle, housing, and social classes. Khartoum has inherited the housing class system from the colonial era.[2] Postcolonial national city plans have followed the same path, further widening the gap between city dwellers.

Recently, emigration from Khartoum back to rural areas has increased significantly, as rents for houses and apartments have skyrocketed by more than 400% and prices for basic goods and most services have risen owing to inflation exceeding 350%—while the share of wages in the cost of living has fallen very sharply, as the minimum wage does not exceed 3,000 Sudanese pounds per month (about $10). This means that most workers in the public sector are living below the poverty line.

In August 2015, the National Action Plan for Sudan's Great Green Wall for the Sahara and Sahel Initiative was completed. The Forests National Corporation (FNC) is implementing part of the REDD+ program.[3] In 2011, the Higher Council for Environment and Urban Promotion of Khartoum State was established by state decree, with a vision intended to stimulate the development of a green, clean, and civilized capital of the country. In 2013, Khartoum State endorsed the State adaptation plan to the cabinet of ministers, a plan that supports the adaptation of sectors and farmers to change.

Building cities in Inner Mongolia, China: modernization, grassland conservation, and resettlement

Background

Drylands in the north and northwest China have since historical times been inhabited by ethnic minority nomads. A few major towns served for a long time as the centres of administration, trade, and transport, especially during the years when nomads had political regimes; but as pastoralists depended on following their herds seasonally to make a living, very few settled in towns. In the prefecture of Xilingol League in middle Inner Mongolia, early urbanization largely emerged as a result of the large-scale in-migration of Han Chinese peasants from the middle of the 19th century (Ye et al. 2012). Despite this significant shift, pastoralists in the hinterlands were still rather mobile, living at a distance and having limited contact with the towns until the establishment of the People's Republic of China in 1949.

In our specific case study area, the emergence and development of a small town S and city Q[4] were, for most of the time, disconnected from their neighbouring pastoral communities. Town S was planned and developed by the government from the 1960s, as it was a stop along a train line, and a state-owned farm hiring Chinese Han migrants was established there. City Q emerged more than a hundred years ago as a stop on a long-distance road transport line, and its expansion was mainly for trade with Mongolia and Russia. Pastoralists rarely visited these towns, because social and economic services—including schools, clinics, and shops needed by the pastoralists—used to be locally supplied at the *sumu* (township) centre where the local administration was located. The *sumu* centre was surrounded by pastoral lands and was distant from the non-pastoral population. Such centres never expanded much, holding only a limited number of non-pastoralists working either for the government or providing basic social and economic services. To leave the pastoral areas and settle down in town S, city Q, or other cities was uncommon, except for those who pursued higher education or joined the army. As elsewhere in China, the *hukou* system (population registration system) played a key role in restricting population flows from pastoral areas to the towns.

Following the economic reform in China after the 1980s, town S and city Q gradually expanded, and pastoralists' connections to them were significantly increased for the market. The *sumu* centre itself gradually declined. Modernization, together with industrialization and urbanization, has become the dominant idea and policy informing an ideal life, and it has significantly changed pastoralists' ways of living. Nowadays pastoralists are mostly settled but live rather spread out over their contracted grasslands. Permanently settled pastoralists, especially following land privatization,[5] resulted in a higher demand on modern home consumption products, and these pastoralists are increasingly dependent on the market to purchase production inputs and sell animal produces (Humphrey et al. 1999). Journeys to the towns have become more and more frequent as motorcycles and sometimes cars have become commonly used among pastoral families. Yet, contrary to the large-scale rural–urban labour migration in the eastern

coastal areas of China, pastoralists had rarely moved to the towns for work and to settle down before the introduction of the resettlement projects that will be analysed below.

Urbanization 1.0: developing a small town through training pastoralists to raise milk cows

Since the 1990s, urbanization has become a major policy in China and has also been strongly inserted into the governance of drylands and pastoralists. The core of the policy rationale is that cities are the engine of economic growth, and the development of small-scale towns is especially favoured for avoiding problems associated with large cities, such as lack of housing and excess traffic. In western China, where poverty has been a more serious problem compared with the eastern coastal area, this urbanization rationale is combined with the objective of reducing poverty, introducing a basic development model (poverty alleviation resettlement) that moves poor rural people to towns to develop new means of living and become better off (Yang et al. 2020). In Inner Mongolia, a more specific model of resettlement integrating a particular type of business model (raising milk cows) was introduced and widely implemented after consecutive natural disasters, including a heavy snowfall disaster in 1999, droughts in 2000 and 2001, and dust storms in 2000, 2001, and 2002. A number of new settlements were established near small towns such as town S, with the intention of resettling poor families from the pastoral areas. Such settlements materialized a set of modernization ideas put forward by the local government, including access to electricity, water, road, telephone, and cable television, intensive agriculture, and direct supply of food and agricultural products to large corporates (Xun and Bao 2008).

Pastoralists became well-off rather quickly in the 1980s (mostly in terms of the number of animals owned), benefiting from the national market-oriented reform, but when natural disasters came in the late 1990s, many pastoralists lost a significant number of their animals and their wealth became fragile. In the past, they depended heavily on spatial movements with herds as the main coping strategy, but this local knowledge was gradually limited in application, as pastures and facilities had been divided into individual households and fences had been erected. High inputs into modernized ways of raising animals were so costly that quite a number of families were pushed into debt and bankruptcy.

Against this background, a new settlement for pastoralists was gradually built on the less populated side of town S from 1999. Twenty of the 500 pastoral families in the study area were first selected, and then a further 180 after one year, to move in and raise milk cows, financed by a government development project. Pastoral households were said to have competed to join the project, allured by the economic and social benefits and better infrastructure, as well as pushed by the increased uncertainty of pastoralism after years of natural disasters. However, the milk cow development model soon encountered considerable problems, challenging the assumptions of policymakers. Most pastoralists could not master the knowledge and skills required for raising milk cows and growing fodder; it

was difficult to earn back their investments (some on credits) on a small scale and over a short term; and the market price of the milk fluctuated so much that it could not guarantee a stable income. Most of the families returned to their pastoral homes after two years when no further support to the business was given by the government, and they resumed herding. Only about 15 households stayed on, either managing a larger scale of production or simply depending on a poverty alleviation subsidy to live. These large producers also combined this livelihood with herding by other family members in the pastoral homes.

Thus, the settlement in town S today looks rather desolate, with most houses empty. After years, the resettled pastoralists are hardly integrated into the social and economic life of town S, not only because the pastoralist' settlement is spatially distant from the old part of the town, but because there are few job opportunities or social events to link the pastoralists to the peasants and other town residents. Although resettled pastoralists have better connectivity to the outside through a nearby highway and better mobile network connections in the town, their lives are very much inward-looking and mainly linked to the pastoral areas.

Urbanization 2.0: developing a city through turning pastoralists into urban workers

Intersecting with poverty alleviation, conserving grassland constituted another and growing policy interest for moving pastoralists to urban areas. Grassland degradation became a media narrative about the cause of dust storms that severely affected the air quality in the capital Beijing area around the 2000s. An entrenched policy rationale of moving people out of ecologically fragile areas to relieve anthropogenic pressures on the environment became a main national rationale, which gave birth to another development model: 'ecological resettlement' (*shengtai yimin*). This new model applied more restrictive measures on the use of grassland, while financing pastoralists to move and settle down in city Q. The pastoralists were settled in a newly built neighbourhood composed of modern apartments, while being offered different skill-training programmes geared towards turning pastoralists into urban workers in construction fields, manufacturing factories, restaurants, local markets, and the transport sector. Monetary compensation and subsidies for children to attend local schools were offered too in exchange for pastoralists moving to the city and not using their contracted rangelands.

Considering the failure of the first project, only 40 families moved into the neighbourhood in the first years, leaving more than 100 apartments empty. Pastoralists' considerations for moving or not moving to city Q and the neighbourhood were mixed, and economic, social, and political reasons intersected in complex ways. Similar to other resettlement cases (Wilmsen and Wang 2015), 'voluntary or involuntary' is not a helpful framework for understanding the experiences and decision-making in the resettlement process; rather, there is a negotiation process laden with power interplay between the pastoralists and the local cadres on behalf of the state. The local cadres had the aim of moving as many pastoralists as possible and enclosing as large areas of grassland as possible to demonstrate

political performance and receive more funding. Pastoralists are not a homogenous group, however, and resettlement worked on and reinforced inequalities. The affected pastoral families can be largely categorized into four groups, based on their social and economic characteristics and whether they moved to the city: *warrior*, *watcher*, *explorer*, and *follower* (Zhang 2018: 374). The *warrior* type had good herds and was determined to stay in the pastoral area, while the *watcher* preferred to stay without reaching satisfactory terms during negotiations with local cadres. The *explorer* and *follower* joined the project and moved to the city. The *explorer* group was composed of local elites who had rich social and economic capitals in both the pastoral area and the city, and some had already established small businesses in the city before moving there. In some cases, they still had family members taking care of animals in the pastoral homes despite this violated the resettlement rules. Followers were families without human resources to conduct good herd management but had large areas of land. Thus, they could receive a considerate amount of compensation upon joining the resettlement project and no longer using their land. These last two groups had contrasting integration into urban life. The explorers established and extended networks out of the pastoralists to other groups and became successful small and medium entrepreneurs, opening restaurants, meat and dairy shops, or hostels. The followers were rather isolated and had restricted social networks, limited mostly to the resettlement neighbourhood. The location of the neighbourhood at the periphery of the city partly contributed to the isolation of this resettled group. It seems to be the trend that these followers are becoming the new urban poor.

However, a distinction between joining the resettlement project and moving to the city should be made. Migration of pastoralists to city Q had already occurred before this resettlement project, mainly after the shutdown of the school at the *sumu* centre in 2001 that followed a provincial education reform policy. Quite a number of young families, especially those with only one child, had a family arrangement that saw the wife moving to city Q and taking care of children while doing informal work, and the husband staying in the pastoral area to look after the herds. Labour migration from the pastoral areas to city Q has also been on the rise since the disastrous years around the 2000s, establishing and expanding social networks of pastoralists in the city. Young people, given that many of them had education in towns and are bilingual (speaking Mongolian and Mandarin Chinese), find familiarity, inspiration, and comfort living in the city. Thus, some families that joined the resettlement project had already been living in the city. There were also some families that joined the resettlement project but did not move to the city as they were expected; instead, they rented and lived on the land of pastoral families that were not part of the resettlement project. These families had negative short-term work or living experiences in city Q and were thus resistance to moving to the city. Above all, the turn of the last century was a turning point, after which pastoralists were more tightly connected to the city due to larger economic and social structural changes, where resettlement projects played a pushing role.

The social life of pastoralists in the city shapes their livelihoods and sense of belonging in extensive but hidden ways. In this migrant city Q, with the majority of

the population coming from other parts of Inner Mongolia and even south China, many pastoralists still have little sense of belonging after living there for ten years. This is closely related to the low status of pastoralists in the social hierarchy. Local pastoralists are seen as undisciplined, with no plan in life and too lazy to work, thus unsuited to becoming 'proper urban citizens'. In a small-sized city such as city Q, having a temporary job is a norm, but to the pastoralist such jobs lack decency and are full of labour controls. Thus, quite often, pastoralists still rely on seasonal odd jobs in the pastoral area—for example, taking care of newborn lambs and shearing wool—to get extra income in addition to compensation and subsidies from the state. Interestingly, women seem to be more established in the urban labour market than men are, as the former find it easier to find stable jobs in city Q, typically working as translators and sales assistants in the local markets. Some resettled pastoralists also moved to cheaper neighbourhoods closer to the centre and rented out their apartments in the resettled neighbourhood. This is not only to earn on renting but also to avail of better networking opportunities with other groups.

What migration means for dryland cities

Drivers and motivations of migration

The current situation of urban growth in ASAL is likely to be a combination of climate change impacts and sociopolitical forces impacting on institutional changes (land and commons resources as well as mobility rules), which drive pastoralists and farmers to settle down in towns. Political drivers include civil wars and political unrest, combined with policy reforms to settle nomadic populations as part of modernizing projects. Economic changes and reforms enable better pastoralist physical and social mobility, change market and trade opportunities, and improve roads and communications, which is an additional important layer to developing towns in drylands. This contributes to the entangled picture of migration drivers. Such processes have been traditionally seen in non-dryland contexts.

In both of our cases, drivers of migration appear to be more a convergence than a distinction of push and pull factors. It is emphasized in the two cases that a convergence of environmental and socioeconomic conditions in rural areas with the cities' attractiveness is driving people to migrate towards towns. The changing conditions in the rural areas result from land and common-pool resource commodification processes and environmental degradation, political events (e.g. conflicts and war in Sudan) and policy decisions (e.g. environmental policy and resettlement projects in China) (see also Chapters 4, 5, and 6, this volume). The changing faces of cities' growth and expansion offer more jobs and income opportunities, as well as markets for trading animal products and purchasing agricultural inputs. Moreover, the diversification of livelihoods serves as a driver for migration, as such diversification can occur before migration. Thus, livelihood change is not only an outcome of migration but, more importantly, a motivation for it (especially for pastoralists).

Formal vs. informal organization of migration

Top-down State policies play a significant role in directing rural–urban migration. In both our cases, State policies affected migration movements and people's lives in the places of origin and destination. While the Chinese case exemplifies a state-led organized process, the Khartoum case shows an unorganized migration but one that is still responsive to government policies. In China, it is a goal-oriented process towards establishing new towns and neighbourhoods, directing migration and directly ordering the change of pastoral livelihoods. In Sudan (Khartoum), there is no orderly programme to absorb migrants, combined with a historical tendency that does not favour pastoralists. In both cases, policies are affecting migrants' adaptation strategies and lives in towns, but in different ways. China is intensely driven and structured by national ideals of development and environmental conservation. Modernization has been at the core of development ideals for pushing resettlement schemes, rural development, and urban expansion. Linear evolutionary thinking posits urban and settled life as the better, more advanced, and ultimate destination of development. Pastoralists have increasingly been drawn into these modernization projects, including deciding to move into cities. The tendency to favour settled over nomadic population is also apparent in Sudan, where pastoral lifestyles have historically been seen as 'backward and irrational'. Therefore, government policies have always favoured horizontal expansion of crop production at the expense of livestock production and pastoral livelihoods. Postcolonial development in Sudan's policies has always favoured arable cropping over pastoralism in terms of jurisdictional, technical, and economic assistance, which has further marginalized pastoralists and pushed them to find other subsistence modes.

Shaping urban spaces through migrants' translocal living

A closer examination of migration processes shows that the city is not necessarily the final destination and not all migrants become city dwellers, some retaining their rural sense of belonging and identity. The future of dryland cities is continuously being (re)shaped by the translocal living of migrants. Our two cases demonstrate this from three aspects. First, migrants live in the city but continue to practise old rural livelihoods. Until the 1980s and 1990s, the city regulations of Khartoum were still offering flexible possibilities and acceptable tolerance for hybrid lifestyles that combined city-dwelling and pastoral livelihoods, such that many families with pastoral livelihood backgrounds were able to breed and keep livestock at their house units. Roaming cows was a common city sight at that time, even in neighbourhoods that were not so far from the business district of Khartoum. This hybrid lifestyle of living in town and practising pastoral livelihood at the same time seemed to be highly accepted. However, city rules and consumptive and housing cultures have dramatically changed with the beginning of the third millennium, limiting and pushing this practice to the peripheries of Khartoum, either in the form of organized large productive farms or as an individual outcome of recently migrated poor families.

Second, migrants live in the city but depend on earnings and resources from the rural areas. In China, as a consequence of the government resettlement projects, pastoralists living in the cities took up new livelihoods despite these livelihoods being rather unstable for the most part, and the majority partially depends on food and cash incomes generated outside the cities to support their lives in the cities. This suggests a common pattern for the two cases, one of strong linkages and flows between the urban and pastoral areas.

Third, migrants circulate between the city and the countryside. A more radical solution for non-integration in the city could have been to move back entirely to the rural areas. Looking at this migration option brings us back to the migration drivers. A general uncertainty and pessimistic view of the viability of herding in the future is framed by climate change and amplified by state policies, institutional change, and the shrinking space and higher cost for practising mobile pastoralism. This is apparent in China with land privatization and the strengthening of restrictive policies on land and animals. In Sudan, the city expansion to incorporate the influx of new migrants is already diminishing the stock of arable land in the area. There is also the issue of water utilization. In both cases, modernization directs the future towards urban lives, and the option of full return migration is affected by policy and environmental aspects, as discussed above. Economic changes such as increase in the price of goods and real estate make life in the capital of Sudan much more difficult for the poor, and even the middle classes are feeling the effect of these changes. Apparently, the countryside, once abandoned, has become newly attractive. As an adaptation mechanism to the economic pressures in the city, most migrants have sent their spouses and children back to the village, while husbands have stayed in the city. Men have moved to communal or shared rented houses or apartments with other single men, to cut the high cost of house rental and send remittances to their families in the village. Economic and living pressures have become, once again, drivers for (re-)migration. At the same time, the cities remain attractive for health services, education, and job opportunities, which are less available in rural areas.

Conclusion

Official definitions of urban and rural still promote the idea of physical boundaries that define geographies and locations, but addressing the human agency of migration helps us to observe the synergies and flows between rural and urban spaces. We pointed to a continuous migration process, characterized by its constant ongoing change and mutual nature, rather than a one-way movement of people from one place (rural) to the other (urban). Nevertheless, environmental hazards continue to affect the lives of migrants, even after they settle down in the city. Migration in these areas is thus not a matter of push and pull drivers; rather, it is a lengthy process affected by environmental change and shaping dryland cities.

The dryland city may look less urban, with its mixture of lifestyles and livelihoods and its options of living in and out of the city in hybrid ways. The different hybrid styles demonstrate different ways in which migrants cope and

accommodate to changes and challenges throughout migration. It is clear, in the two cases, that a full transformation from rural lifestyle and rural-based livelihoods to urban livelihoods almost does not exist. Following the translocal nature of urban–rural relations as discussed by Greiner and Sakdapolrak (2013a, 2013b), we emphasize the unique case of urban centres in drylands. The open and non-linear process of translocal mobility enables relations between places and peoples, from both rural and urban areas, and creates different forms of exchange. Moreover, not just the nature of the city but the nature of its symbolic boundaries and the relations of rural and urban areas are affected by the hybridity of livelihoods. It should be noted that the expansion of cities in drylands, the migration from rural to urban centres, and urban growth occur against a multi-factor background that is inseparable from the effects of climate change. Climate change effects, in the form of slow-onset desertification and land degradation, rapid onset droughts, dust storms, and heavy snows are all highly influential on migration/mobility patterns and become a significant feature of a dryland city.

The dryland city, as shown in the two case studies, is affected by the nature of resources in ASAL. Scarcity of common-pool resources (e.g. water and pasture) in dryland rural areas, coupled with seasonality access and little alternative in the hinterland, motivates the mobility of people. Nevertheless, there is also the other side of the coin, where the commercialization of rural resources is facilitated by migrants to serve the development of urban areas. The relationships between urban and rural areas are shaped by mobility and scarcity of resources. The commercialization of resources and their scarcity are changing the nature of both urban and rural ASAL. Outside factors also shape the nature of a city. The Khartoum case study shows a high level of international presence: relief agents, aid organizations, and NGOs. Their presence affects not only the nature of human mobility but also resource use. The Chinese case shows non-international interference and leave the stage to local actors, allowing them to define their own rules of settlement.

Climate change with its significant and lasting effects on ASAL, urban and rural areas alike, impacts the differentiated nature of migration, the hybrid outcomes, and the necessity for continuous adaptation. Youth and women are two migrant groups deserving a closer look. In both Sudan and China, young male migrants are playing a significant role in the relations of urban and rural locations. The role of women in dryland cities in connection with their different cultural backgrounds deserves further research.

Although climate change and migration are global phenomenon, local perspectives should be part of a future analysis and shared research is required (Haller and Zingerli 2020) in order to be able to discuss locally driven, bottom-up institutions for urban–rural spaces (see Chapter 13, this volume).

Notes

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2 The first class in the centre of the city housed the British governor and administrative staff, the second class housed Egyptians in high administrative positions, and the third class, on the outskirts of the city, was reserved for locals.
3 Reduce Emissions from Deforestation and Forest Degradation in Developing Countries.
4 All the names of places are anonymized.
5 Land privatization takes the form of a renewable land contract between individual pastoral households and the state for first 15 and now 30 years (Banks 2003). Through this arrangement, individual households are entitled to a specific location and size of land with exclusive rights. This policy, called Rangeland Household Contract, started in the middle of the 1980s–1990s and was an extension of the successful experience of privatizing land and incentivizing peasants in the farming areas. Later it also drew on the 'tragedy of the commons' as its scientific basis despite this basis has been questioned and debated among scholars (Liu et al. 2019).

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11 Drylands connected

Mobile communication and changing power positions in (nomadic) pastoral societies

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ICTs: a power to transform dryland livelihoods

The past decade can be characterized as the digital age for poorly connected parts of the world. Here also, wireless connectivity is becoming a reality, improving communication and information flows. 'Especially mobile phones and wireless internet end isolation and will therefore arguably prove to be the most transformative technology of our time' (Sachs cited in Seid et al. 2016: 614). This optimistic message fits studies that place information and communication technology (ICT) in relation to development (ICT4D). It refers to the forecast that ICTs will open new ways to give people voices, allow democratization in political processes, and provide endless access to information that will allow them to develop better livelihoods (see for instance Unwin 2009; Gumede 2018).

Such positive ideas about the relation of a technology to societal change have already been challenged by various empirical case studies showing that the ways these ICTs interact with society do not *per se* follow such progress itineraries (see for instance Bon and Akkermans 2014; de Bruijn and Brinkman 2018). Interaction between society and technology is complex and does not operate in a single direction. ICTs land in an environment and context that they interact with. Developments can go in multiple directions and may equally reinforce inequality and introduce harm to populations (Gustafsson et al. 2019) as have the opposite effects. Recently in Africa, the notion of control has been put forward as governments increasingly control ICT communication and cut down on the internet or use it to reinforce their power over their citizens (Gumede 2016).

New ICTs as an innovative technology have the power to change society (see Duncombe 2018), but they should be understood in a tradition of cultural and social practices (i.e. existing communication practices) and also in relation to historical and sociopolitical contexts (see de Bruijn 2014; Butt 2016; Debsu et al. 2016; Miller 2018; Hahn 2021a). What then are the effects of such infrastructural developments for (pastoralist) livelihoods in drylands that are often associated with remoteness, poverty, and the challenge of numerous crises (Davis 2016)? As some studies have shown, high-tech infrastructures have indeed affected the ways

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pastoralists can make their livelihood (cf. Lind et al. 2020; Waters Bayer and Bayer n.d.). Our study adds to this discussion with an exploration of the possible effects of new ICTs.

In this chapter, we consider ICTs as a resource that can be differently accessed and can be appropriated by various stakeholders. ICTs are a resource—for the states, for (inter)national companies, and for the populations that use them. We focus particularly on ICTs as a resource that facilitates communication and information flows. We try to understand how such technology gives a voice to people living in the drylands. As the case studies will show, new ICTs have taken different forms and—according to the theory of McLuhan (Agel 1996 [1967]), who saw also the form of the ICT as a message ('the medium is the message')—these forms have an influence on the messages that can be conveyed. We focus on the 'working' of mobile telephony, social media, telephone applications (apps), and wireless internet. In our case studies, we touch on several specific communication domains: information flows; its reception and formulation; its giving voice to those who are excluded; women and (dis)connectivity; and the creation of movements.

The development of such technology need not *per se* to be done for the society where it lands. Most telephone developers are based in the West or Asia, and certainly not in drylands. Telecommunication companies are in most cases not national but international business companies. Also, larger NGOs or business developers are based in the global North. They create apps as 'tools' for development. Hence, many innovations are thought out in offices and laboratories in Sweden, China, and England. This raises a question: with what ideas/assumptions are these apps developed? This is discussed especially in relation to the apps that were introduced in Kenya and Mongolia. The case studies situated in Mali and the Negev focus on the introduction of smart and simple phones, with wireless internet, which, as other studies have shown, have been appropriated quickly in nomadic societies (de Bruijn et al. 2016; Seid et al. 2016).

Communication is power, and those who access communication also access power (Castells 2009)—hence changes in this technology of communication will affect power relations in society. The case studies will show how various forms of ICTs in a variety of drylands interact with power relations and change them. 'Technology is a mirror of society' (Lash 1987, as quoted by Abu-Kishk and Mendels 2020). That is, technology is not neutral; it reflects the developer of the technology and his/her/its assumptions and is appropriated by the society where it is used, hence reflecting its political culture. Appropriation is not the same for everybody. Here, we will refer to the digital divide/gap, which reflects power relations in society and the world. The four case studies each show a way of such digital exclusion—which, as Castells (2002) argues, is one of the most abusive forms of exclusion in society and replicates existing socioeconomic gaps.

The four case studies encompass a variety of drylands and the ways their pastoral economies develop, including also their urbanizing trends. These studies show the possibilities in ICTs for the enhancement of livelihoods, but also the limitations in terms of control, non-access, and the digital divide. The case studies also

fill an 'ethnographic gap' in accounts of the relation between political empowerment and the appropriation of new ICTs (see Dafoe and Lyall 2015; Weidmann 2015). The central question in this chapter is this: how do dryland (ex)pastoral communities, in their various forms from nomadic mobility to urban sedentariness interact with new ICTs? We focus on the way the technologies, as a resource for communication and information, enter society and are appropriated (or not) and how they influence local and national (social and political) hierarchies. We also search for the way these empower (former) pastoral societies in the historical and social context of power relations.

Critically evaluating AfriScout: 'The shepherd's eye in the sky' in Kenya

The number of mobile-based apps for delivering information across a wide spatial extent and with finer temporal resolutions has grown rapidly over the last decade. Such apps are embedded in the nexus between development aid groups, tech startups, the state, and rural resource users. These relationships, and their ultimate goals, raise important questions about decisions related to the use of ICTs in environmental sustainability, such as what type of knowledge is shared and why, and what assumptions lie behind these decisions? In this short case study, we focus on this question by first describing the technical and political aspects of the app and its deployment in African drylands.

In 2018, the global development organization Project Concern International (PCI)[2] introduced a mobile application called AfriScout. The app promised to 'revolutionize the way pastoralists find pasture and water for their animals' and thus alleviate some of the livelihood constraints faced by rural resource-dependent communities. AfriScout is based on a satellite-derived vegetation index (NDVI), with mobile technology that provides spatially and temporally explicit information on grazing and water areas through 'grazing maps', as well as information on diseases and violent conflict. AfriScout was piloted in Ethiopia, Kenya, and Tanzania (encompassing 511,709 sq km of traditional grazing land). PCI developed their app on the basis that knowledge about African drylands is 'limited in scope, timeliness, and accuracy'[3] and further limited by climate change where existing knowledge is 'little more than guesswork'. They further argue that this knowledge is becoming less reliable because of extreme weather conditions and land-use changes.[4] They have even 'constructed' these landscapes as dangerous and conflict-prone.[5] AfriScout therefore provides a way out of such 'ineffective' and 'old' ways of finding pasture and water, resources critical to the livelihoods of pastoralists in drylands. The app positions itself as better at understanding the resource conditions than current systems and as being in the process 'empowering farmers to make smarter decisions'.[6]

The creation of such apps is also related to a certain idea about drylands: in general, pastoralists are supposedly in need of 'development'. At the same time, the creators of such apps subscribe to the idea that pastoralists in drylands have high levels of connectivity and ability to share information, for the purposes of

accessing water and pastures for the trade of livestock goods for agricultural produce, and for social-cultural relations such as marriages. The construction of drylands as in need of development is deeply rooted in Kenya's past. Both colonial and postcolonial governments of Kenya have viewed Kenya's northern and southern drylands as problematic, conflict-prone, and inhabited by unruly pastoral people (Mosley and Watson 2016), who need to be controlled (Waweru 2012; Galaty 2016). These views led to different policies linking people closer to bounded territories (Elmi and Birch 2013), such as the implementation of grazing schemes and of group ranches, both policies aiming to settle pastoralists in predefined spaces restricting mobility of people and livestock (Pas 2018).

Currently, the perception of people in Kenya's drylands in need of development is expressed as 'in need of being connected' to the rest of Kenya. The year 2010 marked an opening to change in the ways Kenya's drylands were envisioned, when a clear policy shift took place to not only develop the drylands, but economically modernize them. In the 'Vision 2030 Development Strategy for Northern Kenya and Other Arid Lands', the drylands are seen mainly in terms of their 'untapped potential' concerning trade, tourism, and energy and their need for investments in industry, tourism, and infrastructure for national (and local) economic growth (Mosley and Watson 2016). The vision also promotes the inclusion of pastoralists in Kenya's national development as a way to curtail the continuous marginalization of pastoral areas, while making the drylands 'equal to the rest of Kenya' (Elmi and Birch 2013). High investments in several large-scale infrastructural projects emphasize this need to connect northern Kenya with Nairobi (Elliott 2016; Kochore 2016; Cormack and Kurewa 2018).

In this context, PCI introduced the AfriScout as a means to improve the livestock economy and reduce conflict in the drylands, and, more generally, to develop the dryland regions. AfriScout was launched in Kenya in February 2017, when USAID together with local pastoralists, government officials, members of the State Department of Livestock, and NGOs gathered in Kajiado County.[7] USAID selected Afriscout as an innovation that actually makes a real impact and transforms lives, as the localized maps in the app are stated to enable accurate decision-making towards improved migration and pasture management, which reduces the risk of herd loss.[8] Roughly 2,000 Kenyans were provided with trial subscriptions by USAID, while other users pay a fee.

However, as in the case of Bedouin women in the Negev (this chapter), there is a clear digital divide between dryland livelihoods and the rest of Kenya. It is assumed that people are able to afford the fee or access smartphones through constant phone-service availability and that they are able to read (in communities with high levels of illiteracy) the oversimplified maps provided through the app. Clearly, existing networks of sharing information are underestimated, while the working of the use of an app is overestimated. Consistently, development intervention is based on the belief that pastoralists passively accept the use of such digital approaches.[9]

For many scholars studying the relations between technology, sustainability, and development, mobile apps have often been looked upon with a great degree

of scepticism. An often-used phrase to describe apps is that they are 'solutions looking for problems' (Degnbol et al. 2006). AfriScout proclaims to provide information as quickly as possible, yet an implicit assumption in the app is that people uniformly understand the information displayed and can process and deploy that information in meaningful ways. Based on its implementation in Kenya, we find that AfriScout is problematic in several ways:

First, the natural environment tends to be overly simplified, using indices not easily understood by users. For example, AfriScout uses NDVI as a base layer at resolutions ranging from 250 m to several kilometres[10] and does not reveal what type of vegetation is present. The resolution of the imagery is likely to mask variations in vegetative cover.

Second, the app assumes that users can afford the yearly license fees and expensive data packages, have access to smartphones, and will be within areas that have reliable phone service. The price of data and digital literacy represents a definite barrier to widespread adoption (Machado et al. 2020).

Third, the app suggests that pastoralists and other rural resource-dependent communities do not maintain their own indigenous social communication networks based on kinship and trust (Butt 2015; Pas 2018).

Finally, there are inherent power relations between indigenous communities and development groups that view indigenous people as being in need of development. Placing smartphone apps in the hands of these people often romanticizes people and landscapes and situates them as recipients of technology and advancement. The adoption of these technologies may appear successful at first, without a deeper understanding of the historical and political dynamics of exploitative development interventions (Tinga et al. 2020).

Impact of communication technology on transforming sociopolitical relations and resolving disputes: Mongolia

This case study intends to explore the role of communication technology in resolving disputes and empowering local communities surrounding mines in Mongolia. Since the 2000s the development agenda of Mongolia has been dominated by mining, as the sector attracts 60% of foreign direct investment and makes a major contribution to the country's economy. Mining accounts for a third of the GDP and 89.2% of the state's total exports, but it employs only roughly 5% of the workforce (Diener and Batjav 2019: 781). Mega-investment in mining dominates the national economy; licenses are granted in the capital city, while social and environmental impacts disrupt countryside lives and livelihoods. Nomadic pastoralism, though key to the nation's cultural identity, is less important to the economy. Herding still relies on mobility and frequent movement of herds and campsites. This way of living and its daily practice are being reshaped, however, by the development of infrastructure for mining and related transport (Sternberg and Chatty 2016). Negative impacts are emerging, including resettlement of herders, pasture fragmentation, lack of access to water, and pollution problems. Some short-term benefits have been the creation of jobs related to mining, compensation

for selected herders, and improvement of local roads and access to electricity. The fundamental contradictions between mining and herding practices in perceptions of land, water use, and relations to culture and tradition are difficult to reconcile (Sternberg forthcoming).

As elsewhere, Mongolia embraces ICT, with citizens enamoured of smartphones, social media, and local websites. Today, the number of smartphone users per hundred persons in Mongolia is about 2.3 times higher than the world average, but only 4% of internet service users live in rural areas (Tsolmondelger 2019). By actively adopting new technological tools (primarily mobile phones) and services (e.g. SMS, Twitter), locals join new networks of communications between herding communities, government officials, and development programmes (Hahn 2018). For instance, ICTs play a role in reshaping the patterns of herding movement and, by extension, campsites (Diener and Batjav 2019). However, to date the internet has not been harnessed to bridge the rural/urban and community/company infrastructure divides. These dividers are situated in the complex and rather rapid political and social-economic shifts that this pastoral nation has undergone since 1990 (Sternberg et al. 2015; Sternberg 2018). On the one hand, industrialization, modernization, and urbanization strongly affect and reshape pastoral lives (Kingsley 2017). On the other hand, the society is characterized by a set of polarizations and paradoxes, where open democracy coexists with corruption, high education levels, high unemployment rates, poverty for nearly a third of the population, a modern capital, and a lack of basic economic and information infrastructure in large rural areas.

The Mongolian government, despite its investments in ICTs (Johnson et al. 2005; Hishigsuren 2006; Jackson 2015; ITPTA 2016; Hahn 2020), has failed to succeed in bridging the gap between rural and urban areas (van Doodewaard 2004; Johnson et al. 2005). The Mongolian government holds strong control over the country's telecommunications backbone, through its majority ownership of the Mongolian Telecommunications Company (Tsolmondelger 2019). However, nowadays larger players such as foreign investors have increased rural connectivity through ICT and roads. This is done to serve the larger strategic goals of cross-continent flows of resources, rather than for the specific benefit of locals (Diener and Batjav 2019; Joniak-Lüthi 2020). In addition, NGOs and other social actors have been engaged in using ICT in creative ways to empower vulnerable communities, but largely for project-based conservation (McCarthy et al. 2018) and hazard management purposes (Barnes et al. 2020).

In our case study in a mining area, the interest and access to the internet have not improved the exchange and interaction on mining information, laws, taxes, jobs, expansion plans, and ownership. More seriously, environmental and social impact assessments, taxes paid, company and government responsibilities, and citizen's rights have not benefited from increased ICTs and their potential. This challenge and the social need have captured the attention and energy of a group of local researchers, with support from the University of Oxford. The striking inequity between mining companies (foreign and domestic) and isolated communities leads to a vast information gap that negatively impacts community

development, as communities are not informed/do not know/cannot pursue their rights and legal remedies. Extensive field research (Sternberg et al. 2020) identified a lack of knowledge and access to information as a key problem for herders and town dwellers in understanding and effectively pursuing measures to protect and advance their livelihoods, rights, and customs. The desire of community members to become informed is difficult to meet over large distances, limited educational opportunities, costs of travel to the capital, and the demands of the dominant herding lifestyle. In this context, developing a mobile phone application has the potential to engage and remedy several issues through the innovative use of ICT. The project is still in its pilot phase.

In Mongolia, pastoralists refer to someone who knows everything and makes proper decisions as a *mergen boodie*. *Mergen* means wise, clever, and *boodie* is a little hedgehog. Giving this name to the mobile app conveys content and knowledge for herders about mining. As the app has been developed, NGOs (Steps without Borders, IRIM, Gobi Soils) have been natural participants. Perhaps more surprising, the Ministry of Mining and the Cabinet Secretariat have been supportive of efforts to disseminate information through the app. Their motivation arises from the social challenges mining has brought, the divisions within society, and the government's difficulties in resolving problems. Ministry support for civil society efforts (here by NGOs and universities) to address the issues is easy to provide, as it helps address public and political concerns. The app can present public data in a more accessible form. For herders, the app reduces the barriers between lives lived and new external forces beyond daily comprehension.

The mobile phone app in development presents levels of knowledge and information on mining and site-specific detail. This includes company-reported revenue, tax data, licensing requirements and obligations, and satellite images of operations. As the prototype is tested, local residents are able to comment and contribute to the app through interviews, photographs, and short videos. This approach makes their stories available to a national audience. In addition, the app enables citizens to make mine-related complaints directly to the government. In Mongolian language, with Mongolian faces and content, and with updated news and development issues, the app mirrors the interests and concerns of the rural population.

Essential in the mobile app development is balancing herders' common patterns of ICT engagement: visual, with information on a small screen. Here, NGO involvement and field evaluation are essential. Taking into account education levels in the countryside and the complex nature of mining data, the app can become a connector and conduit between rural citizens and government. Only trial and error show what content interests herders versus what outsiders think is important. For example, the nicely presented complaint-form link on the app will still take time to fill out (perhaps a child will help), and although logged by the government, it may be swallowed by the bureaucracy. Without quick responses, herders may lose interest. The process shares information and initiates thoughts and questions for herders about mining changes seen on TV, viewed in their homelands, and discussed with friends and families.

Because the internet and social media are popular, and cheap mobile phones are easily available over the border with China, phones are not the issue. More challenging for ICT connectivity are transmission antenna and signal strength, lack of wi-fi zones, and the ability to charge phones as pictures and content quickly run down batteries. Solar panels and car batteries are the main power sources for herders, but they vary in reliability. Signals are better on hilltops (even standing on a vehicle can help). These challenges lead people to watch videos together, which is acceptable for entertainment viewing but less rewarding when examining mining data (e.g. taxes paid, contracts, impact assessment claims). Still, apps are well known from TV and this one is particularly relevant to herder livelihoods.

Here, ICT is a marvel that breaks down the 'tyranny of distance' and encourages collective experiences, even if only virtual ones. 'Early adapters' are always necessary: herders who share the app among friends, designers who create an app for rural communities, or ministries open to new forms of public engagement. While a mining-related app is promising, it has its limitations. Will herders in fact return to view it after their original curiosity is satisfied? *Mergen boodie* offer a chance to democratize some information. The real measure of ICT effectiveness will come when herders drive the app engagement and development to suit their own needs, interests, and lifestyles.

ICTs and the reinforcement of exclusion policies: the 'digital divide' among Bedouins in the Negev and the case of Israel under COVID-19[11]

The 'digital divide' as presented in this case study is a mirror of the status of Bedouins in Israel, and especially of women within Bedouin society. As we focus on young women (students), we demonstrate in miniature the complexity of the relationship between the Bedouin population and the state of Israel, through the lens of ICT ownership and use.

The Bedouin population in the Negev currently numbers 270,000, constituting about 3.5% of Israel's population and close to 30% of the Negev population (Abu-Kaf et al. 2019). Since the 1950s, the Israeli government has implemented a policy of establishing new settlements and transferring the Bedouins into permanent residences, delimiting this essentially nomadic population to living within the boundaries of towns and villages. This ongoing process has led to towns planned by the state, 'unrecognized villages' with 25–40% of all the Bedouin in the Negev. The former nomads are now engaged only in minor practices of semi-pastoralism, with a limited semi-nomadic livelihood present.[12] The literature distinguishes four generations of Bedouin women, and these generations demonstrate different abilities to cope with instability and crisis. Older Bedouin women have lost their traditional status, but they remain a source of power and personal security; second-generation women facing transition difficulties operate behind the scenes; third-generation women are the most integrated in the world outside the traditional tribes, but they are in the midst of an unfinished transition process—these women are positioned between their mothers' generation and their daughters' generation

and therefore nicknamed 'the split generation' (Alhuzail 2018); the fourth generation women are undergoing a substantial change that has not yet been completed. It is this fourth generation that is the subject of this study (Meir 1997; Alhuzail 2014).

Israel is one of the world leaders in the percentage of its population with internet access—78% of Israeli households (Schejter and Lee 2007; Abu-Kaf et al. 2019)—but Bedouin villages have only 34% of their households connected to the internet. Against this background, the pandemic situation sharpened the existing inequalities in society, one of which is the position of Bedouin women. At the core is the long-standing dispute between the state of Israel and the Bedouins over land rights. The state's refusal of recognition is part of the daily life of their inhabitants, who do not enjoy full-service provision: they are not connected to the electricity grid, water and sewerage systems, and telephone lines and internet services that should be fully provided by the State. The low level of services in villages and the lack of infrastructure reflect the core issue of the dispute over land rights.

Based on mapping the ownership of ICTs among young Bedouin women, who were in various stages of their academic studies at the onset of the COVID-19 pandemic, the case study shows Bedouin women (fourth generation at times of crisis) suffering from a double digital divide. Following the COVID-19 pandemic and alongside the seclusion at home and the social distancing guidelines, higher education campuses were closed and the faculty moved to online distance learning. The case study examines the implications of these measures for female Bedouin students and examines their end-user equipment, how they connected to the internet, and the nature of their internet use.[13]

The data collected show that the majority of female Bedouin students' own smartphones (78%), and a majority testified that it was a major tool in daily life, with a prominent use for learning purposes (92.1%). However, there were two negative findings: the diverse means of connection and the low quality of cellular reception. This also explains why, despite the high rate of smartphone ownership allowing for easy connection to social networks, we found only 42.9% used social networks for a high sharing of social issues among themselves. The most common apps used were WhatsApp and email applications, and less usage was found for all others. Most respondents pointed out that using social networks was accompanied by concerns over the sense of being controlled and supervised by the family and the collective. This remains valid and threatening among young Bedouin women in higher education institutions when they use social networks. The interviews revealed that the distance-learning experience was particularly affected by the ability to connect to the internet and the technical difficulties that accompanied this.

Feelings of helplessness, anger, and anxiety emerge from the interviews. The sense of drowning that interviewees described exemplifies the magnitude of the anxiety and the sense of failure. As emerges from the interviews and the data collected, distance learning inevitably entailed technical and substantive difficulties that hampered their learning ability and provoked thoughts of dropping out of

formal education. The technical barrier, which is beyond their control, burdens the already difficult distance-learning experience, impairs their ability to continuously participate in their studies, and therefore may affect both their social place and the process of social change that is in progress.

The situation of young Bedouin women, who suffer from a double 'digital divide', reflects the digital gap that exists between Negev and the rest of Israel. The vast majority of female Bedouin students (who participated in the study) face a three-level digital gap (Abu-Kishk and Mendels 2020):

The access gap: only one-third of the respondents have a wired internet connection in their home; the rest rely on a cellular connection. However, about two-thirds of the respondents reported that there was partial or no cellular reception in their place of residence. Thus, the significant barrier for them was the lack of access to infrastructure that allows connection to the internet and the lack of ownership of end-user devices that allow connection and use.

The skills and uses gap: this refers to the inequality in the ability to utilize ICT while exercising critical judgment. The findings show that young Bedouin women's use is concentrated on WhatsApp, emails, and text messages, and they do not use additional channels. The use of the internet for them is limited to academic needs and information retrieval. The data indicate the skills gap and the weakness of female Bedouin students in the diverse uses of a digital environment, including the use of complex sources of information and the software, required particularly in modern society (Eshet-Alkalai 2004; Ganayem 2018; Lev-On et al. 2020).

As we also introduced in this study, ICTs are influenced by the social, political, and economic environment and the discourse that surrounds it. These factors are reflected in how female Bedouin students use the internet in a way that is subject to the patterns of behaviour set for them by their society. It is also reflected in their concerns about the use of the internet and social networks and their use of social networks as a private space. It is evident that these young women suffer both from the weakness of the status of Bedouin society in relation to Israeli society in general, and from their own internal weakness within Bedouin society.

The participation gap: this third gap stems from the previous two and relates to the difference in the experience of those who enjoy full access to advanced internet services compared with those who lack it (van Deursen and Helsper 2015). From the interviews, it can be seen that the negative experience of the female students during the COVID-19 pandemic affected their participation in distance learning. The students, who had relied until then on the services of the academic institution (library, computer classrooms) to meet academic requirements, found themselves with the imposition of the lockdown and social-gathering restrictions without an available solution. This case study demonstrates an occurrence at a specific time and in a specific place, but more than that it indicates a broad phenomenon.

Lack of access, along with difficulties in the intelligent and diverse use of media, can lead to the exclusion of groups and individuals from key social discourse

arenas and to the limitation of their ability to accumulate resources and develop abilities (van Dijk 2005). This is also the case where a state of crisis is adding to an already existent exclusion. In this case, the poor general infrastructure, including only partial deployment of cellular antennas, resulted in difficulties in reception and in connecting to the network (Abu-Kaf et al. 2019) became a part of effective government control over the Bedouin population. The challenges posed by the COVID-19 pandemic highlight the unique status of young Bedouin women and their dependence on the existing infrastructure in their place of residence, thus challenging their place in the process of social change.

Nomads unite: mobile telephony in Sahelian crisis communication

This case study recounts a specific episode in Fulbe semi-nomadic life in central Mali that developed also with the changes in the communication landscape. Here, we sketch how the mobile phone has become a real resource in the changes in livelihood that have come along with the conflict that has divided Mali since 2012.

The story is based on a long ethnographic engagement with the Hayre, a specific group of pastoral semi-nomads in a specific region in Central Mali.[14] There are several large aspects involved in the interaction between Fulani semi-nomads, society, technology, and the conflict, and these aspects are related to historical and geographical differences. In the Hayre, Fulani society has a strict hierarchical ordering. With the arrival of the colonial state bureaucracy, the political and religious elites of these Fulani became gatekeepers/intermediaries in nomad–state relations. The nomads had a (politically) marginal position in the postcolonial state, and the protection of their elites resulted in many cases of extractive policies by state agents with regard to the main wealth of the nomads: their cattle.

The transition from analogue to digital communication came late in the region, especially in the rural areas. The capital city, Douentza (then around 9,000 inhabitants) received electricity only in 2000. The first poles for wireless technology appeared in the city shortly afterwards. People from the rural lands would already go to the towns to make telephone calls, but only a decade later the nomadic camps also had direct access to wireless communication. Around 2009 connectivity improved as more wireless communication masts were erected (Keita et al. 2015). The (semi) nomadic pastoralists of this region began to use their new connectivity to relate to others who had left the region (Keja, Amadou and de Bruijn 2020), and this created increased connections with, for instance, more urbanized fellows. The ideas of those who had left, and who were now more connected with the world and ideas outside of their own original society, began to trickle down into the pastoral community (Keita et al. 2015).[15]

In 2012, an ethnic conflict merged into a war between the Malian state and a liberation movement that was later complicated with the incursion of jihadi movements (Lecocq et al. 2013). Leaving aside the origins of this war, we will describe the way ICTs have been appropriated by a variety of stakeholders and

have become a weapon in the war, and also for the semi-nomadic pastoralists who, in their society, belong to the politically marginalized. The rebel groups from the north occupied central Mali, quickly being overrun by jihadi groups (MUJAO), followed by the arrival of the French, who 'reconquered' the region in the beginning of 2013. However, central Mali did not regain full state control, nor any military control, which turning the area into a non-governed zone. During the jihadi 'occupation', the jihadi soldiers offered their phone numbers for security calls; so, whenever there was a problem, a phone call could mobilize protection. After they left, insecurity returned to the region.

In the specific case, we are referring to here, a fellow Fulani nomad, who was also chief of a group of nomads close to the border of Burkina Faso, began a 'crusade' to unite the Fulani semi-nomads, in order to establish security in their region. He went from leader to leader, either travelling or by using his mobile phone, to inform them about the situation. His efforts to unite the Fulbe succeeded. A meeting was organized where over 1,000 Fulani from the region met (Sangaré 2016, 2019; Sijsma and de Bruijn 2019).[16] Without mobile phones, this could not have been realized.

The nomads had hoped to get support to securitize their region. That did not happen. The leaders of the nomads also visited embassies of the European Union and NGO offices in Bamako, but actions did not follow. They decided then to organize their own self-defence groups. The young men started to join the jihadi groups. Today only the cities (Douentza, Boni) are controlled by the Malian military; the bush is rather volatile and largely controlled by Fulani militias, who in some cases are associated with jihadi groups. Videos from the region that circulate through mobile phones show large groups of young men with motorcycles who prepare for attacks; other videos show what happens after attacks of military camps, displaying the trophies, from cars to heavy weapons. As Fulani are a majority population in the region, they are also the majority in these groups.

Over time, mobile phone transformed into smartphones, which would carry especially Facebook and WhatsApp as channels of communication. Modibo Cissé conducted research on the ways propaganda from these groups affected the (semi) nomadic groups (Cissé 2019). A very important moment was the appearance of the sermons of Hamadoun Koufa, a Fulani Muslim singer, from the Inner Delta of the Niger. Today, he is an ally of 'AlQuaida dans le Magreb', a unit led by a Tuareg group who were part of the incursions in 2012. What is clear is that the Fulani nomads also receive these sermons and preaching in their phones. Hamma Koufa directs his attention to Fulani and, for instance, speaks about the marginalization of the Fulani in the Malian state.

In this case, we have seen the mobile phone appropriation by semi-nomadic Fulani who have joined a violent conflict that was based on historical realities, a narrative that was politicized via social media channels. We could refer to this as discursive warfare. The question remains: how do social media and mobile (smart)phones, play a part in a media war that has real effects on the ground?

Discussion and conclusions

The four case studies have represented different dryland dynamics, related to urban transformation, state control, people's livelihoods, and to connectivity histories. We began this chapter with the question how the introduction of new ICTs, and their relation with society, affected the (pastoral) societies in the drylands. It is clear that connectivity in its different forms is a resource, but not only for the inhabitants of the drylands. Important to note is that connectivity is a resource in terms of tax money for the state, income for international companies, and for the NGOs for whom it also means the continuation of their interventions. In the concluding remarks, we will focus on how connectivity is or can be a resource for the population of the drylands, but how its optimal penetration is still a problem.

For all drylands, distance is a concern. The distance between the rural and urban centres also represents a difference in access to State and other services and a distance between social groups; furthermore, the drylands as vast rural areas are not well served with connectivity infrastructure. New ICTs, especially mobile phones, have been able to reduce certain aspects of this distance. Today it is easy and affordable to connect to other regions and people. However, does this new connectivity indeed overcome the distance? For instance, has it led to more access to education, to the market, and to national politics? The app introduced in Kenya has as its main objective to improve connectivity with the market and to supply information in order to produce better. As the case study showed, there are still too many issues hindering its success. In the Negev, we have seen how young women, despite better connectivity, are still excluded simply because the technology is not good enough and is manipulated by those in power. In Mongolia, the attempt to connect through apps was received with enthusiasm and does indeed overcome distance, allowing access to more information; but the cost of using the technology underlying the app is expensive, and despite the bottom-up approach, it is still uncertain whether it will become a lasting success. In central Mali, the presence of new connectivity has led to further marginalization from the centre of recognized power, and there has been a move towards a powerful periphery. Hence, ICTs may turn out not to be powers that bridge the gap between the periphery and the centre, while at the same time they open the possibility for shifts in power relations.

Each of the case studies deals with specific ICTs and their appropriation in society. In the case of the nomads in Mali, the appropriation of mobile phones into their communication ecology was rather smooth. We can say that in this case the mobile phone enhanced mobility, mobilization, and finally organization into a rebellion against the State. Such changes also remind us of the processes of fission and fusion that are characteristic of nomadic society. In the case of the introduction of the apps, another process is at work. The Afriscout app in Kenya is developed by outsiders who have specific ideas about the needs of the pastoralists in drylands: the recipients are low-tech, marginal, and need to be developed. However, dryland communities have gone through multiple changes, similar to the case of communities elsewhere, and we should not get fixated on

the image of a low-tech society (Hahn 2021a, 2021b; Waters Bayer and Bayer n.d.). Blinded by this image, the app developers overlook existing knowledge, skills, and ways of doing. Finally, the question is this: who will be benefitting from such technology—especially also when it has to be paid for? Costs are also hampering the acceptance of the 'development' app in Mongolia, despite its participatory development, and the early enthusiasm of the pastoral communities involved.

Central to an understanding of the 'working' of ICTs is the way they can be accessed. The example of the young Bedouin women in the Negev is a case in point. Although in principle they should be able to access the online systems freely, in practice they cannot. This case illustrates how the digital divide reflects the Israeli government regime. The access, skills, and participation gaps are part of a politics of marginalization. The strong Israeli state clearly has its own appropriation and control of digital communication technology. It can be interpreted as an extension of the deeper conflict, and hence a weapon in that war. Here, political conflict is translated into denial of access to internet services for those who are not in power. The technology then becomes a way to exclude people even more. This raises an important question: if we consider ICTs as a resource, for whom is it a resource? Who controls the access and the development of these technologies after all? Also, in the case of geo-app development, there is an important access question to be raised. In Kenya—and in Mali, for instance, where similar apps are introduced—pastoralist economies are diverse. There are extremely rich pastoralists who can afford to keep their animals in place (ranching) or those who live with their cattle/animals for a family living. The rich may profit much more from such geo-apps than their poorer neighbours do, and hence apps can increase existing inequalities and give more power to the few 'modernizing' pastoralists in the drylands.

(New) ICTs are certainly a resource, and they offer multiple possibilities with their communication and information functions. The benefits of communication over long distances, the simple function of voice calls, do make the pastoralists from the drylands more aware of their situation, and this may open the possibility to give them more voices in decision-making about the drylands—even if the politics of the State are against it. However, those who represent the drylands in these voices will still be those who have access to the ICTs, and who define power relations.

Notes

1 The authorship follows alphabetical order from the third author. Annemiek Pas and Bilal Butt did the Kenya case, Troy Sternberg and Qian Zhang did the Mongolia case, Nurit Hashimshony-Yaffe and Hama Abu-Kishk did the Israel case, and Mirjam de Bruijn did the Mali case.
2 PCI, based in the USA, is dedicated to preventing disease, improving community health, and positive community development.
3 https://www.pciglobal.org/AFRISCOUT/ [Accessed 3 November 2020].
4 Accessed 2 December 2020.
5 http://stisolutions4sdgs.globalinnovationexchange.org/innovations/afriscout [Accessed 2 December 2020].

6 http://stisolutions4sdgs.globalinnovationexchange.org/innovations/afriscout [Accessed 2 December 2020].
7 https://divportfolio.org/resources/seeking-greener-pastures-will-kenya-s-rural-pastoralists-pay-for-digital-satellite-powered-maps [Accessed 2 December 2020].
8 https://globalcommunities.org/pci-archives/afriscout-app-debuts-in-washington-dc/ [Accessed 4 April 2022].
9 Perhaps the app would have been appreciated somewhat differently if it had followed a participatory development process similar to that of the app described in the Mongolia case (this chapter).
10 SAPARM: Finding green pastures thanks to satellite data. Available online at: https://www.eurisy.eu/stories/saparm-finding-green-pastures-thanks-to-satellite-data_174/?__GP_URL__=saparm-finding-green-pastures-thanks-to-satellite-data_174 [Accessed 29 January 2021].
11 Negev (a desert region in the south of Israel) is the Hebrew term for Arabic *Naqab*, the term used by the Bedouins.
12 Unrecognized villages are those not built by the state and are therefore illegal settlements. For more details see http://www.dukium.org/wp-content/uploads/2014/06/DINSC_JAN_2017_HEB-print.pdfAnd:https://www.dukium.org/the-arab-bedouin-community-in-the-negev-nagab-a-short-background/
13 The study contained two stages and applied a mixed methods approach. Mixed methods are used to present a complex picture of reality (Greene 2007; Shorten and Smith 2017). The first stage included two background interviews and semi-structured interviews with female Bedouin students. The interviews provided us with the preliminary information and served as means to construct an online questionnaire, with 140 respondents. The online questionnaire was distributed in November–December 2020 through education institutions, in WhatsApp groups of women Bedouin students and using the snowball technique (Morgan 2008). All the details are anonymous.
14 I undertook research in the region from 1989, for MA and PhD theses, and later as a post-doc. Later I headed various research programmes in the region. I also published, together with Han van Dijk, an ethnography of the Fulani in this region (de Bruijn and van Dijk 1995).
15 Blog post: https://mirjamdebruijn.wordpress.com/2015/10/12/quest-for-citizenship-of-the-fulbe-seminomads-in-central-mali/comment-page-1/#comment-1344
16 See a video report with a researcher in Mali in which the conflict and the meeting are discussed: https://voice4thought.org/watch-online-hopeless-biographies-of-radicalization/

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Part IV

Responses and potentials

12 Pastoralists under COVID-19 lockdown

Collaborative research on impacts and responses in Kenyan and Mongolian drylands

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Andrea Pase[1]

Introduction

In the early months of the COVID-19 pandemic, catastrophic prophecies about the tragic fate of poor countries under the impact of the SARS-CoV-2 circulated widely (Burke 2020; Nyenswah 2020). Yet, while American and European sophisticated health systems were buckling under the pressure of the new coronavirus, dryland countries in Africa and parts of Asia—and their pastoral areas in particular—were reporting few, if any, related casualties. Dryland pastoralists are well known for living off environmental stochasticity (Krätli and Schareika 2010) and bouncing back from disasters, including epidemics and epizootics (Waller 1988; Tiki and Oba 2009). At the same time, harsh governmental contagion control measures—among the toughest in the world (Tallio 2021)—could be expected to challenge the lives of populations that already grapple with marginalization, political instability, land grabs, food insecurity, aggressive infrastructure development, scarce governmental services, and increasing climatic volatility (this volume). In the face of this new, global crisis, we wondered how pastoralist societies whose resilience builds upon mobility, reciprocity, and solidarity would deal with State injunctions to 'stay at home' and be 'socially distant'.

Based on first-hand accounts of pastoralist friends and collaborators, this chapter examines how Kenyan and Mongolian livestock keepers experienced and

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responded to early State-enforced lockdown measures (hereafter, 'lockdown(s)'). We found that, like elsewhere, lockdowns have exacerbated existing socioeconomic vulnerabilities linked to gender, age, and structural power inequalities (Leach et al. 2021). But our case studies also suggest they promoted different kinds of mobility, collective action, pastoral knowledge transmission, and cultural revitalization, and created space for specific livelihood strategies to blossom.

In April 2020, some of us, members of the *Drylands Facing Change* COST Action,[2] became curious about the role that the SARS-CoV-2 would play in drylands' economic, social, political, and environmental dynamics. But investigating this in the field was off-limits because of pandemic travel restrictions. To overcome this obstacle, we reached out to friends and former research assistants in dryland communities and, in close partnership, explored how they were negotiating lockdown-related closure of borders, roads, markets, schools, places of worship, and grazing areas. A timely small grant allowed us to organize a working group and collect data remotely on the pandemic's impacts as they developed over time.[3]

While the working group covers a broad range of geographies and livelihoods, here we focus on how Kenyan and Mongolian (agro)pastoralists responded to governmental lockdown measures when these were at their strictest. In what follows, we first describe our working group's remote and participatory approach to these and other questions. Second, we share qualitative findings resulting from collaborative knowledge production with Kenyan and Mongolian (agro)pastoralists of both genders. Through case studies covering the period when the firmest restrictions were enforced (Kenya: March–July 2020; Mongolia: January–May 2020, followed by a 'weaker lockdown' until May 2021), we highlight how our research collaborators, their families, and their communities tackled lockdown hardships; and how some resorted to creative solutions and pastoral knowledge, practices, and institutions to adapt, resist, and, in some cases, thrive. But, first, a few words on how we collected data without leaving our desks.

Collaboratively researching the dryland COVID-19 experience while in lockdown

With stringent travel restrictions in 2020, investigating the encounter of (agro)pastoralists with SARS-CoV-2 had to rely on remote ethnography (Postill 2016), which, in the wake of the pandemic, has become the new normal in social scientific research (Hermans et al. 2021).

Starting in May 2020, we invited friends and former research assistants living in arid and semi-arid areas of Burkina Faso, Cameroon, Chad, Ghana, Kenya, Namibia, Sudan, Uganda, Israel (Bedouin community), and Mongolia to tell us about their lives under strict lockdown. Together, we have explored responses to the impacts of the lockdown across different groups (gender, livelihoods, minorities). Our collaborative researchers (henceforth, co-researchers) are women, men, elders, and youths who are (agro)pastoralists, farmers, and urban residents. Some are also university students, tourism workers, community activists, and civil servants. They have shared their experiences by sending us regular

updates on their pandemic experiences through mobile phones, social media, and email.[4] Most have no formal training in research. Guided (for inspiration) by a list of comparative research questions about local understandings of the disease and about impacts on food security, mobility, land/water issues, education, social, cultural, and religious practices, and environmental conservation (Roque de Pinho et al. 2020), co-researchers also explore the questions *they* find most relevant, choosing when and how to share their data. Some send weekly audio and text messages. Others favour sharing typed or image files of handwritten monthly reports. Yet others, speaking from their homes, shine as online presenters at our working group's weekly meetings, which feature a member presenting findings, followed by group discussion and analysis of cross-site patterns.[5] This flexibility is crucial given co-researchers' living circumstances (e.g. unstable internet connections).

From humble beginnings in the early stages of the pandemic, this project has developed organically and adaptively, without an imposed hierarchy, nor claims of methodological or disciplinary supremacy—following instead multiple, evolving relationships and exchanges among academics and mostly non-academic dryland residents. Best described as rhizome-shaped research (see Clarke and Parsons 2013), this approach embraces inter- and transdisciplinarity, collaboration, flexibility, open-endedness, and surprise (Clarke and Parsons 2013; see also Hermans et al. 2021). Beyond helping to overcome travel restrictions, it is also best suited to examining relentlessly surprising virus-human interactions (Stephen et al. 2015).

Reflecting the fluidity of our rhizome-based network of researchers and co-researchers and the importance of our mutual friendships, our writing style is narrative and informal. To translate the multiplicity of voices involved in this work, the four case studies presented below are written in their lead authors' first voice and include direct contributions from their respective co-researcher(s)-*cum*-co-author(s), who have verified and approved this account. By voicing how the lockdown has upended their lives, and through their own analyses of ensuing processes, co-researchers assume a dual role, that of key informants *and* researchers in their own terms, with whom we share authorship of research outputs (Gubrium and Harper 2013).

'People are really suffering'—Loita, Narok County and Rombo, Kajiado County, Kenya

On 15 March 2020, two days after the first coronavirus case was reported in Kenya, President Uhuru Kenyatta announced the first COVID-19 lockdown measures. International flights were suspended; schools, churches, markets, and bars were closed, and social gatherings were banned. People were further advised to wash hands regularly, wear masks, and keep social distance. Those above 60 and those chronically ill were told to self-quarantine. As the coronavirus continued to spread globally, more measures were introduced, including a countrywide dawn-to-dusk curfew, a lockdown of COVID-19 hotspot counties, including Nairobi, and the closure of Kenya's borders with Somalia and Tanzania.

The closure of the border between Kenya and Tanzania undermined the food security of Maasai (agro)pastoralists. The border line drawn by the British and German colonial powers during the 1880s 'Scramble for Africa' ran right through Maasailand. While this boundary artificially created 'Kenya Maasai' and 'Tanzania Maasai', it had remained porous and under little government control, and strong cross-border relations existed reflecting family ties and inter-ethnic marriage and trade. The pandemic changed this: control of border areas suddenly increased, limiting the erstwhile fluid movement of people, goods, and livestock. There were now regular police patrols, and, in unmanned border points, deep, wide trenches were dug to prevent vehicles, motorbikes, and bicycles from crossing.

The Maasai are organized into several sections, which are Maasai territorial sub-groups with their own leadership structures. I (Angela) worked with three Maasai co-researchers; one is a Kisongo Maasai, which is the largest Maasai section; and the other two are Loita Maasai, one of the smallest sections. Both sections straddle the Kenya–Tanzania border.

Daniel Mayiani (Kisongo, in his late sixties) is an old friend of my father. I call him *mpaapa* (father) because he and my father are from the same generation. Daniel lives in Kitengela near Nairobi with part of his family, but his roots are in Rombo, where he has land and cattle and is a recognized community leader. Before the pandemic, he used to go there every two weeks. But during the lockdown, a chronic health condition and medical facilities in Nairobi kept him in Kitengela under the watchful eye of his wife. Daniel gathered information through phone interviews with friends and relatives in and around Rombo. These include Kisongo Maasai on both sides of the border, and Chagga, a Tanzanian agricultural community. He also consulted the Kenyan national archives for information on past disasters, wrote two reports following the comparative questions list, and emailed additional information (our main means of communication).

My other two co-researchers, Lenaai and Matinkoi ole Mowuo, are brothers from Loita, in their late thirties/early forties. Matinkoi was my research assistant in 2001 when I was doing fieldwork in the Loita Hills for my master's degree and Lenaai assisted me in 2007–2008 during my PhD fieldwork. Back then they were unmarried and belonged to the 'warrior' age-group; now they are both family men and have nearly completed all necessary age-group ceremonies to become 'elders'. We call each other *enkanashe* (sister) and *olalashe* (brother).[6] Lenaai and Matinkoi sent me regular Facebook and WhatsApp text and audio messages and photos, often in response to direct questions. While Matinkoi mainly reported on his and his family's experience, Lenaai asked women, elders, and youth around him, seeking to get a broader, more balanced picture of lockdown impacts on the Loita Maasai community.

Both Rombo and Loita abut the Tanzania border. Rombo, eastern Kajiado County, is located in the dry plains between Mount Kilimanjaro in Tanzania and the Chyulu Hills in Kenya, between Amboseli National Park to the west and Tsavo West National Park to the east. Loita is in the highlands west of the Rift Valley in Narok County. It is a rather isolated area flanked to the east by the Naimina Enkiyio forest and the Nguruman escarpment. To the north and

west, the Loita Maasai are surrounded by the more numerous and politically well-connected Purko Maasai (another Maasai section); to the south, Loita territory extends into Tanzania. About 50 years ago, Maasai in Rombo and Loita started farming and now combine pastoralism (cattle, sheep, and goats) with cultivation (primarily maize and beans).[7] Land in Rombo was privatized as a group ranch in the 1970s and has been subdivided recently with individual title deeds issued. Loita was for long one of the remaining Maasai areas under customary land tenure although individualization has happened informally (Kronenburg García 2015).

The closure of the international boundary hampered the trade of foodstuff and cattle and the movement of farm workers, affecting food security in Rombo and Loita. In Rombo, Chagga women from Tanzania would come during market days to sell cheaper fruits and vegetables and buy milk from Maasai women. With the border closure, this trade was restricted, hiking up food prices on the Kenyan side, sometimes as much as 50%. Maasai farmers in Rombo and elsewhere in Kajiado County rely on the horticultural knowledge and skills of casual Chagga farm workers, but now farms were unattended, stoking fears of failed harvests. The livestock trade also suffered, as Tanzanian traders could not come to the Rombo livestock market and prices plummeted. This, in combination with livestock market closures throughout Kenya, meant that families dependent on livestock sales for their household needs found themselves in trouble.

Lenaai and Matinkoi reported similar dynamics in Loita, where everyone was trying to sell their animals to buy food. Also, with (boarding) schools closed and those who lost jobs returning home, there were more mouths to feed at home, and putting food on the table became a challenge. A general food shortage in Loita, partly due to the border closure, also resulted from other factors. First, with the weekly food markets closed, shops were the only place one could buy foodstuff (rice, sugar, cooking fat). However, the Nairobi lockdown affected the food supply to Narok town, on the main supply route to Loita, and stores gradually emptied. At the same time, the roads to Loita became nearly impassable due to heavy rains. Finally, maize and beans were not ready for harvest. To survive, people relied on milk and slaughtered animals for meat. Men organized meat camps (*ilpuli*), which are secluded gatherings where they consume large amounts of meat and blood and exclusively drink herbal soups. The little food available in the shops was bought at much higher prices. The dire situation in Loita did not remain unnoticed, and food relief was distributed to the community's neediest, first by individuals (a South African missionary and friends) and later by the county government.

In response to the border closure and food shortages, cross-border smuggling increased, and black markets for livestock sprang up in Loita and Rombo. In Loita, illegal livestock trading took place in hidden places 'in the bush' at the border, very early in the morning or late in the evening, and sometimes overnight, and on different days from the usual market days. This was risky business and those caught by government authorities faced heavy fines. In Rombo, traders who struggled to access wholesalers in locked-down counties, especially Nairobi and Mombasa, opened illegal crossing points to import foodstuff and other goods from Tanzania. Others travelled long distances on foot to buy food in Tanzania

to bring back to their families in Kenya. Meanwhile, across the border, there was officially no pandemic and Tanzanians lived without restrictions: Kenyans started to cross to drink in bars and go to church. Ironically, the cross-border movement continued and perhaps increased, although in a covert form. Worries about food availability continued, however. During past disasters, Maasai had sought refuge among agricultural neighbours when faced with famine—'there was some form of hope', as Daniel explained. Now, there was nowhere to run to because COVID-19 'is affecting the whole world'.

'They see [COVID-19] as a bad thing which they cannot even mention with their mouth'—Kalacha, Marsabit County, Kenya

The COVID-19 pandemic has placed us all in the same situation: a combination of health crisis, restrictions imposed by governments on their citizens, and deep uncertainty. Troubled by the crisis in the world and in Israel, my home country, I (Nurit) asked an old friend from northern Kenya how the pandemic was affecting her community. A fateful, unexpected partnership led to my research with Sabdio Wario Galgallo, who serves as a government officer representing the President of Kenya and is titled 'the Chief' in her community, Kalacha.

Sabdio and I first met a few years ago while I was going to Loiyangalani. Our truck driver stopped when he saw her along the dirt road and gave her a lift. This brief encounter with an impressive young lady wearing a red dress in 'the middle of nowhere' was the beginning of our enduring friendship. Sabdio is from Kalacha, an oasis located in the heart of the Chalbi Desert, 'the land of white soil'. A former trading post (Schlee 2019), it includes eight scattered villages with around 5,000 people within Marsabit County, one of Kenya's poorest counties (KNBS 2013). Most Kalacha residents are Gabra, an Oromo-speaking group of camel pastoralists and Catholic Christians (Toblino 1999; Adugna 2014). The arid land, limited rainfall, and never-ending search for pastures are inherent to their identity and a source of regional conflict (Imai 1982; Stiles and Kassam 1991; Linke et al. 2015).

When I first contacted Sabdio, in June 2020, the news of the pandemic and ensuing government lockdown regulations had already reached the area. Since shortly thereafter, Sabdio and I have regularly chatted on WhatsApp, and she has shared her views and information through written documents, photographs, and short videos. At that time, there were no COVID-19 cases in Kalacha, but lives had been affected and changed. Together, we mainly explored the ways in which COVID-19 affected pastoralist lives and livelihoods, especially those of women.

In Kalacha, strong restrictions were introduced to people's lives. However, compared with a year earlier, the good rainy season and greening pastures brought satisfaction and the promise of a better future. The horrors of a global epidemic were not neglected, but they did not obscure the local joy. The common view was that it would be over soon, and for most it was not even real. Some NGOs arrived in the area and started campaigning from house to house, providing face masks, soaps, and sanitizers. 'The message has reached everyone, so far our

county, Marsabit, is safe from COVID-19', Sabdio explained. Yellow plastic water containers became part of the local landscape as handwashing stations. At that time, regional ethnic conflicts did more to disrupt daily life than the pandemic.

While there was a general feeling that people were safe as they were not in urban centres, it was the lockdown measures taken by the Kenyan and Marsabit County governments that had the strongest impacts—most particularly the closing of churches, which motivated people to worship privately at home, and of educational institutions. Boarding schools and universities sent students back to their homes in the villages, where they found themselves out of the formal educational system and unemployed. This was most influential. According to a letter from the Ministry of Interior and Coordination of National Government that circulated among local community leaders:

> The country has witnessed an alarming increase in pregnancies. The pregnancies not only disrupt young girls' quest for education but also pose serious physical and psychological health challenges to the young girls. This trend, if not checked, will have far-reaching negative socioeconomic impacts to the nation.[8]

Sabdio emphasized that the issue was solved among the Gabra by the strength of Christianity and traditional Gabra beliefs, as explained below.

With young people now in their family homes, the formal education system was replaced temporarily by their parents' presence (especially that of mothers) and informal, traditional employment instead of teachers and school classes. While boys were sent out to herd the camels, young girls were kept in the house. Sabdio explained the new situation: 'The girls are around house to learn how to cook, wash and get skills of basketry from their mothers so that they make them better housewives in the future'.

According to a national survey, 57.5% of the Kenyan population reported moving to self-learning at home, while 17.0% of households discontinued all formal education (KNBS 2020). In remote rural areas such as Kalacha, this took on its unique shape of 'home schooling'. While in Israel my students went online and sat long hours in front of screens, in Kalacha teenagers got acquainted with tradition. The government restrictive measures drove Gabra women to adjust to the new situation. They transformed a challenge into positive social change by introducing young people to traditional Gabra norms, skills, and practices, which also supported the household economy. Incorporating local indigenous knowledge into the daily lives of youth became an ad-hoc response to the crisis.[9]

In the first months of the pandemic, Kalacha pastoralists, and especially the women, experienced profound changes in their daily lives. Their ability to cope with the new uncertainty was rooted in a solid religious belief, Gabra cultural norms, and—no less—in powerful local leadership. When the restriction on public gatherings was lifted, the Church reclaimed its central role in public life in Kalacha, promoting a revival of worship and providing an important meeting place on Sundays. Sabdio added that Gabra people thought the virus would not

survive the hot and sunny environment. She explained this as a 'conservative attitude' of people attached to their cultural beliefs and explanations of a religious nature, according to which the harsh arid conditions are difficult not only for people but also for viruses. Emphasizing the conservative nature of her community, she added that people do not talk about the pandemic as '[they] cannot even mention [COVID] with their mouths'. In contrast, she stressed her own role as a community leader in demonstrating proper hygiene and installing handwashing stations.[10] Above all, however, even with these new challenges and community practices (e.g. sanitation)—whether there will be enough rain remains the central question for northern Kenyan pastoralists.

'It's funny, we're doing the normal Maasai life'—Talek and Narok, Narok County, Kenya

Contrasting with the positive mindset in Kalacha, fear shaped early reactions to the pandemic in pastoralist communities around the Maasai Mara National Reserve (MMNR) in Kenya. Located to the West of Loita, in Narok County, this protected area is a leading tourist destination directly connected to international travel—and thus a potential entry point for the coronavirus. Around the reserve, Purko Maasai combine pastoralism, some cultivation, and tourism-related employment and businesses. The sudden shutdown of tourism was a major economic blow to individuals (self-)employed in the hospitality industry centred on the reserve and surrounding wildlife conservancies. Paradoxically, by freeing the area of conservation restrictions, it also paved the way for a revitalization of the pastoral economy and culture.[11]

To document local responses to the lockdown, and their consequences, I (Joana) partnered with two former collaborators with whom I first worked in the context of a visual anthropology project (Roque de Pinho 2013). Stanley ole Neboo and Debra Seenoi, both in their thirties, lost their jobs in tourism when the lockdown came into force. But, as we will see, their trajectories soon diverged, suggesting how intersecting factors such as gender, access to land, and ownership of livestock differentially shape resilience around the reserve.

Stanley is a livestock keeper who lives with his family in a multi-household traditional homestead in Mpuaai, a tiny rural community bordering the reserve, near the town of Talek, inside the former Koyiaki Group Ranch.[12] A 'freelance safari guide' before the pandemic, he is a member of three wildlife conservancies, leasing parts of his land to the tourism/conservation organizations that manage those tracts of land set aside for wildlife conservation. Conservancy membership entitles landowners to monthly lease payments but restricts livestock grazing within the conserved area. When I first met Debra, she was a schoolteacher and lived in Mpuaai. After divorcing, she moved with her children to Narok, the county capital, working as an online consultant for a Kenyan tourism company.

In addition to our regular contacts via WhatsApp, phone interviews with Stanley and Debra helped probe their personal experiences and observations. Both are keen speakers and regularly share their findings and analytical insights at our online working group meetings.

Stanley first heard about Italian 'corona' deaths in February 2020 and felt scared for Europeans. Around him, people talked about the 'end of the world'. On 15 March, parents like him were given one day to gather their boarding-school children, city-employed people returned to their villages, and all businesses closed. 'A strong policeman, more feared than corona', he said, enforced the curfew, roadblocks, and tourist departure—adding to the sense of dread exacerbated by social media misinformation. In that first week, 'staying at home' meant safety. In Mpuaai, people kept to their homesteads, gradually relying on milk, fat, meat, and blood from their animals, and 'natural honey' and herbs. Livestock-poor households (re)discovered the strategy of adding a herb (*Olkirowa*) to water to 'extend the little milk' in it. In contrast, urban residents like Debra dashed to the food stores before they closed. Later, Debra subsisted on scarce boiled-meat soup and relief food provided by private and non-governmental donors. 'Putting food on the table' remained a problem for her.

On the second week, 'men ran to the bushes', with Stanley and others joining meat camps (*ilpuli*). Rather than preparing for war and cattle raids as in the past, this time the goal was to 'immunize our bodies' with the medicinal beverages. Stanley thoroughly enjoyed these meat camps' unusually intense exchange of ideas and information. At home, out-of-school children cared for the animals, and women cooked enormous quantities of special dairy foods to welcome the men returning from the meat camps. Men had fun drinking five litres of milk, a practice whose disappearance senior elders blame on 'small stomachs' caused by farming. With their hired shepherds gone, elders enjoyed herding full-time. And with churches closed, people worshipped at home. Food sharing and solidarity increased, blurring wealth differences at the time. Fear eventually subsided, surpassed by the pleasure of husbands and wives spending time together and elders imparting pastoral skills and knowledge to youngsters. More positive sides emerged: 'Corona is supporting Maasai culture by making pregnant *mamas* stay home', elders said; and with markets closed and fearing contagion through money, people bartered small stock and milk, as in 'the normal Maasai life', as Stanley explained, laughing.

Three weeks into the lockdown, Stanley and friends started illegal livestock 'bush markets', away from police control. They would also 'relocate [their] cows' on lorries (permitted) and sell them across county lines (forbidden). Together with other factors, this encouraged a turn to cattle production and invigorated Maasai pastoralism, as I explain next.

First, because of tourism revenue loss, conservancies halved their lease payments to Maasai landowners and in return granted them access to the pastures inside the conserved areas. With 'the best rains ever' occurring then, and abundant grass, this allowed animals to fatten without having to move and run into police. Second, another virus intervened to boost cattle trading: 'scarier than corona', the Blue Tongue Virus had decimated sheep flocks by April 2020, so people fell back on cattle. Finally, in May 2020 Kenya's largest dairy company started purchasing milk in Maasai households around Talek. This encouraged herders to strategically acquire Maasai cattle and achieve a fast production of calves and milk. Selling milk became women's main source of income, and the milk cow became the hottest commodity on the market—so profitable that owners of cars

and urban plots used those assets to invest in cattle. With businesses closed, urban plots were no longer desirable anyway. Debra also reported urban youth groups investing in cattle. This was unprecedented: before, Stanley explains, 'people were afraid of conservation' and restrictive policies had encouraged smaller herds of improved cattle breeds. Now, people enjoyed herding and trading Maasai cattle, while being tourists on their own land—watching wildlife and holding meat camps in the deserted conservancy hotels.

Maasai pastoralism at large was energized. With 'everyone at home', organizing graduation ceremonies was enthusiastic, and more people than ever attended—even Evangelical Christians and university graduates. Massive numbers of animals were purchased, exchanged, donated, slaughtered, and consumed. Senior elders felt vindicated by this long-awaited re-centring of life around the Maasai cow: 'We cannot benefit from *your* car, but everyone can benefit from *our* cow', they happily told younger pastoralists. Those who had kept large herds, previously considered 'not modern', were now celebrated. Younger men were proud of overcoming lockdown challenges without external support: 'We solved the problem ourselves', Stanley said. For him, free access to pastures inside protected areas was key. Counter-intuitively, the very conservation policies that had restricted pastoralism now offered 'space for livestock grazing'.

Contrary to Stanley's reports, and reflecting her difficulties as an urban single, unemployed mother with bills to pay, Debra never sounded quite as upbeat about opportunities afforded by the lockdown. In fact, to her, there were none. Landless and stockless, she could not capitalize on livestock. Her data, instead, emphasized her and other women's struggles. She worried about girls' lockdown-related forced marriages, teenage pregnancies, and school leaving; and church closures that left women's groups without meeting places and their pastors' spiritual comfort. Where Stanley saw increased solidarity, she experienced less sharing than usual. In town, around her, parents unable to pay rent and feed their children became mentally disturbed. Some committed suicide. With her children staying in her ex-husband's village, Debra frequently felt lonely. She turned to YouTube and WhatsApp to learn farming and start a small business.

Clearly, lockdown life was better in the villages than in town. Around Talek, pastoral strategies and cultural institutions safeguarded physical and mental health, and cattle production was boosted. Ironically, the MMNR was created after the 1880s Rinderpest pandemic had depopulated large swathes of East Africa of people and cattle (Hymas et al. 2021). This time, a coronavirus emptied the Talek area of tourists and created space for pastoralism to rebound and sustain rural communities—a lesson that elders expressed as, 'See? The cow is more blessed than money'.

'We have our meat and milk; what more do we need?'—Khentei, Bulgan, and Zavkhan Provinces, Mongolia

In fact, Mongolia did not have a COVID-19 pandemic in 2020. In January, the country closed the border with China. This prevented thousands of Chinese

workers from returning after Chinese New Year and effectively isolated the country. News of the pandemic spread to even the remotest pastoral regions. Television covered government announcements, news reports presented the details, and people shared and re-shared information on social media. In the countryside, herders visited family and neighbours to discuss the coronavirus, improvised masks from old cloth, and went on with work, trying to keep the animals warm (it was winter) and prepare for the birthing season. As the mysterious disease gradually became a global threat, herders accepted restrictions on daily life to prevent its spread. Yet pastoralists sensed they were safe, protected by geographic isolation and the knowledge that the country had no cases.

With much interest, Batbuyan Batjav, a long-time friend and research partner, and I (Troy) started collaborating in June 2020. Batbuyan would give regular COVID updates through Skype and presented in online meetings about his conversations with herders. We developed this preliminary work into a successful grant proposal that enabled more systematic field research with herder households in November 2020 (Sternberg et al. 2021a). Batbuyan, Bolor-Erdene Battsengel, and Enkhbat Sainbayar travelled to three regions (Khentei, Bulgan, Zavkhan) visiting herders. Friendships with these families opened a window on pastoral perspectives, thoughts, and responses to COVID-19. They shared milk, tea, and conversation in herders' *gers* (yurts). Already cold outside, there was time for informal discussion centred around the list of comparative questions. Families were together, children attempted remote schooling, women and men liked talking about life on the steppe. What emerged was a common approach and strong civic response to 'prioritize the nation's safety and citizen's health', as one woman explained. As part of a shared, countrywide effort the herders felt a valued part of society and at the forefront of the national response.

Across hills, plains, and valleys, co-researchers conducted 57 semi-structured interviews (36 men and 21 women) in regions east, north, and west of the capital Ulaan Baatar. Participants spoke of an intense initial response when normal life stopped. The government took swift action and implemented restrictions. Schools closed and children returned to family homes. Face masks were required, travel to district centres was discouraged, and roads to the capital were blocked. With much community interest, local clinics were converted to 'COVID wards'—a room where beds were separated by plastic sheeting. Then Mongolian New Year Tsaagan Sar celebrations, set for February 2020, were quickly cancelled to prevent super-spreader events. This pivotal decision made clear to citizens how serious the disease was. Then in March, a French mining engineer became the country's first COVID patient. News spread rapidly and protection efforts were redoubled. Still, throughout the countryside no cases were reported.

Meanwhile, lives continued, animals were born, and work needed to be completed (Figure 12.1). Most herders live kilometres apart, so taking herds to pasture or watering points could be done without fear of contagion. Explanations of individual and community responses were conveyed in a gracious, thoughtful manner. True to Mongolian ways, people spoke of the unexpected positives: families were together now that schools had closed, children could develop herding skills

Figure 12.1 Spring 2021, Khentei Aimag. Photo by Batbuyan Batjav.

and knowledge. Elders spoke of new respect for herding and national appreciation for the importance of pastoralism; now it was the turn of rural residents to support and provide food to the capital. Because of COVID restrictions, shipments of meat and milk to urban areas had been curtailed. Convoys of slaughtered sheep, goat, and horse were sent to relatives in the capital from each region. Health workers canvassed households, explained COVID-19's symptoms, and encouraged safe behaviours. The Health Department sent out informative text messages to mobile phones every three days. Communities came together to help each other—for instance, by bringing food to elders who could not get to shops. Neighbours checked on each other across the vast distances. Through raised awareness people's health actually improved, they exercised more, and the government's alcohol ban made for safer and more pleasant towns.

There were burdens. Most participants complained about collapsing children's education; many felt the school year had been lost. Efforts at distance learning were poorly regarded. This was 1–2 hours by grade level over TV or internet. Yet mobile herders often had difficulty getting a signal or access. Lessons were designed for city students; children often felt lost. Travel restrictions meant selling animal products was difficult and that traders could not come to town or camps. Prices fell, reducing income and making debt repayment a burden. COVID-related government assistance was key; most important were child benefit payments, then cashmere price supports. The constraints on mingling went against Mongolian's open nature and placed people in a social limbo. Regular health care visits to doctors and hospitals had been suspended, so some medical issues went unattended. The response had been immediate and impeccable, but after ten months residents had grown weary of the impositions. Whilst grateful there had been no cases in their area, respondents wondered if, and how much longer, the restrictions were needed.

Co-researchers Batbuyan, Bolor, and Enkhbat, living in Ulaan Baatar, found the research of great interest. Rather than the city-focused response emphasis

that usually dominates Mongolian politics and planning, the fieldwork refreshingly presented the pastoral perspective. The countryside, covering 99% of the territory, was key to isolating the nation, particularly along the long Chinese border. In Mongolia, the local issues became part of the national dialogue and news cycle. Like weather reports, each province provided daily updates on the COVID-19 situation and actions taken. The effectiveness of digital tools and media in initiating a rapid response was eye-opening to one co-researcher, who is now Deputy Minister of Digital Development and Communications, as it showed how rural residents had embraced smartphones and media platforms. Over time, mobile technology became central to the government's National Emergency Action Plan. Unexpectedly, the pandemic created a ground-breaking opportunity with herders as a keen, engaged group that could be reached over great distances through digital technology. This success has received global attention (Samarajiva 2020; Stevenson 2021) and placed pastoralists as trendsetters in using mobile communication as an effective means of communicating COVID-19 information in rural communities.

Mongolian herders' lifestyles, adaptability to changing circumstances, and historical resilience enabled a successful response to COVID-19 in 2020 with zero rural deaths recorded. Remoteness, rapid engagement with COVID-19 challenges, and feeling like an integral part of the national effort were points repeatedly stressed in interviews. One male herder (56) stated: 'We have our meat and milk; what more do we need?' A sense of independence whilst being part of a strong community stood out in the herders' stories. Pastoralists were proud that they were able to adjust to the pandemic through traditional practices and strengths. In Mongolia, herders survive and thrive in the contemporary world.

Discussion

In remote, but close, collaboration with our Kenyan and Mongolian (agro)pastoralist friends and co-researchers, we qualitatively explored how their communities responded to COVID-19 lockdown measures. As we anticipated, these measures created challenges for populations already exposed to multiple climatic and political economic crises. In drylands elsewhere, they undermined livestock mobility and marketing (Simula et al. 2021), value chains (Krauss et al. 2021), tourism income flows (Gargallo and Heita 2022), and food security (Kansiime et al. 2021). Some of these disruptions also took place in our study areas. However, our co-researchers' experiences and observations reveal other shared, more nuanced patterns. These reflect a triple paradox whereby mobility, restricted in some places, popped up elsewhere; legal suspensions of individual freedoms fostered different liberties and spurred collective action; and 'social distancing' combined with rural marginality encouraged a re-centring of life on the 'home' and its social life and traditions.

First, and in contrast with other pastoral areas (Simula et al. 2021), mobility did not disappear. In fact, to restrictions on mobility and trade that impacted food security, Kenyan (agro)pastoralists responded with—sometimes clandestine—mobility and trade: in Rombo, people overcame government-dug trenches (see also Simula et al. 2021) and border controls to access Tanzanian products and

services. Around Talek, after legal barriers between Maasai-inhabited land and protected areas fell, cattle moved into previously restricted spaces. And Loita and Talek (agro)pastoralists moved into 'the bush' to set up markets and illegally traded animals across county lines and international borders (contributing to local, national, and regional food provisioning). Contradicting observations elsewhere of undermined informal economy and livestock marketing (Krauss et al. 2021; Simula et al. 2021), these responses based on mobility supported the local economies. In Loita and Rombo, they helped struggling families to access cash even as livestock prices fell; around Talek, livestock prices even boomed. As Leach et al. (2021) suggest, such responses challenge structural power relations: we saw herders evade state control over border crossing and long-distance trade; and in the Mara, the balance of power between Maasai landowners and conservation organizations shifted in potentially transformative ways.

Second, the legal suspension of individual freedoms to move and socialize had paradoxically liberating outcomes. In our marginalized study areas, the restrictions opened spaces of freedom (Kenyan conservation areas) or did not affect them (Mongolian pastures). Away from national centres, excluded from global (tourism) flows, family and community self-reliance grew. With some State financial assistance (Mongolia; see also Gombodorj and Pető 2022) and without any of it (Talek, Kalacha, and Rombo in Kenya), herders expressed pride in their capacity to solve problems autonomously. Counter-intuitively too, the lockdown stimulated socialization and collective action, with people coming together for events and worshipping, organizing 'bush markets' and long-distance trade (Kenya), and feeding urban centres (Mongolia). Overall, solidarity is perceived as having increased (see also Simula et al. 2021; Sternberg et al. 2021a), as commonly observed in the immediate aftermath of disasters (Kaniasty 2020).

Third, restricted movements, curfews, closed schools, and lay-offs promoted a re-centring of life on the home, altering people's relationship with 'tradition'. In both countries, while families struggled with online schooling, our co-researchers reported on elders transmitting pastoral knowledge to youth, and those formerly employed reconnecting with practices perceived as 'traditional'. Impacted at first, cultural and religious life soon bounced back (Talek, Rombo, Kalacha), although the Mongolian government cautiously maintained its ban on ceremonies in 2021. The lockdown encouraged a positive (re)valuation of pastoralism at both the local level (Talek, Kenya) and the national level (Mongolia).

Yet, as we anticipated, a closer look at generally positive experiences reveals unevenly distributed socioeconomic impacts, shaped by structural inequalities. As the contrasting experiences of (agro)pastoralists in Loita and Talek, on the one hand, and those of Stanley and Debra in Talek, on the other hand, suggest, the ability to deploy certain responses varied with access to land, livestock, natural resources, and non-livestock assets, being further shaped by broader factors such as climatic variability. The first divide lies between rural and urban areas. At national levels, Kenyan and Mongolian (agro)pastoralists had zero COVID-19 cases in those early days, mostly felt safe, and were generally more food secure than urban residents (see also Gombodorj and Pető 2022). Relying on natural resources

has been a key lockdown coping strategy of dryland rural communities (Krauss et al. 2021), which depends on access to land and secure tenure rights (Walters et al. 2021). Maasai Mara pastoralists were lucky to have both, being further benefitted by their access to pastures inside protected areas. This helped sustain, then boost, livestock production. In Mongolia, a scarcely populated countryside allowed herders to care for their animals (their main food source) and move them without fearing infection and barriers to mobility. This was nationally beneficial as their meat donations supported nutrition in the cities. In contrast, those who lived in urban centres and/or had no livestock nor land to fall back on, like Debra, struggled nutritionally, economically, socially, and mentally—a globally observed pandemic pattern (e.g. Kang et al. 2021).

In Kenya, the second divide reflects the degree of dependence on farming. While the exceptional rains were a blessing everywhere because animals could graze close to home, in Loita, with crops yet to ripen, rain-damaged roads prevented the import of foodstuff. Rising food prices led to distress livestock-selling, exacerbating food insecurity. In contrast, with excellent rains and free access to previously restricted pastures, Maasai Mara pastoralists easily turned to cattle as a coping and investment strategy, which was crucial in the absence of any type of State support. This constitutes a major difference from Mongolia, where State financial support for pastoral activities helped soften the pandemic's economic impacts.

Finally, there were gendered impacts. For girls and some women, being at home full-time did not bring just joys and new teachings, and teenage pregnancies and domestic violence surged in Kenya (Stevens et al. 2021). While new women-led milk businesses thrived around Talek, the lockdown ruined women's milk selling in other pastoral areas (Simula et al. 2021). Mongolian co-researchers, however, did not report increased burdens for women.

Reflections on collaborative remote ethnography

Across our diverse geographies, we—researchers and co-researchers—shared the experience of 'staying at home' because of a coronavirus. This forced us to reconfigure our approach to research. Unknowingly at the time, we answered Pappagallo and Semplici's (2020) pre-pandemic (and prescient) call for methodologically embracing 'messiness' when conducting research in high-variability contexts. We did just this as we explored (agro)pastoralists' lives under high local and global uncertainties caused by the pandemic. Conducting 'messy' research—remotely, experimentally, and collaboratively—relying on insights from our friends in the drylands, and analysing findings without 'being there' entailed letting go of usual research hierarchies and relationships. Over time, through trial and error, as we adapted to evolving pandemic conditions at home and in our field sites, and in constant dialogue with our co-researchers and across our many disciplines, the research design morphed into a rhizome configuration (Clarke and Parsons 2013).

In practice, in lockdown ourselves, we approached data collection in ways that were both deeply grounded in our co-researchers' agency and knowledge and

responsive to their livelihood needs. This, for example, included waiting for their information while they moved with their animals. But 'letting go' also resulted in enlightening surprises as co-researchers improvised focus-group interviews and consulted national archives. Going with their flow, we opened ourselves to the perspectives and insights of directly affected individuals. Our friendships in the study communities have ensured trusting long-distance research relationships. And in our weekly online meetings, we have conducted collaborative analysis of findings, by discussing and comparing emerging patterns—whenever possible with the active participation of co-researchers.[13] These processes of 'co-collection' of data and collaborative analysis contrast with early, also out-of-necessity remote but more conventional, COVID-19 research that used media sources and second-hand information (Brain et al. 2020), external expert opinions (Griffith et al. 2020), and surveys (Lendelvo et al. 2020; Kansiime et al. 2021; Krauss et al. 2021; Walters et al. 2021).

Of course, triangulation of information was a casualty of working with one or two co-researchers per study area.[14] Nevertheless, taken together, reports from multiple (agro)pastoral areas, as personal as they sometimes were, have exposed shared experiences and relative vulnerabilities of individuals and groups—and pastoralists' own reflections on these. By sharing their pains, joys, and—for some—journeys of cultural (re)discovery, our co-researchers have co-created finely textured qualitative knowledge about the complexity of living under lockdown, while shining light on the interplay of local, regional, national, and global inequalities in these drylands. We agree with Pappagallo and Semplici (2020) that engaging pastoralists as co-creators of knowledge has led to a better grasp of how they have managed (pandemic) uncertainty, in the process answering Rogerson and Baum's (2020) call for transdisciplinarity in COVID-19 research. Through this 'messy' process, we have strived for more inclusive and equal research partnerships—horizontal-collaborative rather than vertical-hierarchical ones. This has taught us all, from our diverse walks of life, valuable lessons and skills, preparing us to adapt our research to future crises, as Hermans et al. (2021) suggest.

Conclusion

While epidemics and epizootics are features of pastoral areas, a global lockdown is a new thing. In the face of early, severe state-enforced restrictions on mobility, social, and economic life, Kenyan and Mongolian herders responded with variable combinations of ad-hoc creativity and reliance on pastoral products, institutions, knowledge, and solidarity. As people grappled with curfews, closed borders, roadblocks, and economic insecurity, the lockdown exposed the contemporary relevance of livestock-based food systems (Krätli et al. 2012), pastoral institutions, ecological knowledge, and collective action (Reid et al. 2014). There was both adaptation (livestock-based foods, meat camps, traditional medicine) and resistance through evasion of state authority (illegal trading and smuggling) (see Engebrigtsen 2017; Köhler 2021). Some individuals and groups even thrived. Under this new

crisis, unprecedented in geographic scale, elements of Gabra, Maasai, and Mongolian more exclusively pastoral systems have emerged as strengths. By drawing attention to these, our co-researchers' stories help counter crisis narratives about the impacts of the pandemic in the global South.

So, one might say that things looked pretty good for some (agro)pastoralists in parts of Kenya and Mongolia during the pandemic's first year. However, as we know, the virus did not stop spreading when lockdowns ended. Over time, pandemic complexity increased with spatially and temporally variable containment measures, viral mutations, vaccination campaigns, and fake news, combined with attempts at restarting economies in politically and climatically unstable contexts. For instance, in the Maasai Mara, the resumption of tourism and conservation policies (July 2021) and an unseasonable drought (November 2021 to January 2022) have again restricted pastoralism, and cattle market prices tumbled to their lowest levels.[15] In 2021, Mongolia saw infection rates increase, and restrictions toughened rather than eased. Though now differently from the lockdown period, evolving (post-)pandemic processes are still challenging the daily lives and aspirations of marginalized dryland populations. Exploring their legacies is an ongoing step in our research.

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Notes

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2 J. Roque de Pinho, A. Kronenburg García, N. Hashimshony-Yaffe, T. Sternberg and A. Pase were members of *Drylands Facing Change: Interdisciplinary Research on Climate Change, Food Insecurity, Political Instability* COST Action (CA16233), an EU-funded research network project (2017–2021).
3 The *Covid-19 in African, Asian and North American Drylands* Working Group includes dryland residents in the role of collaborative researchers and academics from a wide range of disciplines, who are mostly based in Europe: https://converge.colorado.edu/-working-groups/covid-19-in-african-asian-and-north-american-drylands/. The working group is currently supported by the *Mobilities and Socialities: Covid-19 in the Drylands of Africa and Beyond* project, funded by the Cluster of Excellence Africa Multiple at the University of Bayreuth and the Deutsche Forschungsgemeinschaft (DFG), within the framework of the Excellence Strategy of the Federal Government and the Länder - EXC 2052/1 - 390713894.
4 The grant paid for their internet expenses.
5 Some co-researchers also participated in the Pastoralist-to-Pastoralist Forum on Covid-19 (Sternberg et al. 2021b).
6 I belong to their mother's clan because of the inclusion of my father in that clan.
7 In Rombo, which is drier than Loita, Daniel estimates that 20% of Maasai farm.
8 Office of the President, Ministry of Interior and Coordination of National Government, 30 June 2020.
9 Future research will address the importance of local knowledge.
10 The importance of community leadership will be most apparent after the first year and is beyond the scope of this chapter.
11 This continued well into the pandemic's second year and is explored in a forthcoming publication.
12 The group ranch was previously under collective title, owned and managed by a group of Maasai elders. It was subdivided in 2009. Its members are now private landowners.
13 At the time of writing (2022), co-researchers were sharing updates on pandemic-related impacts and responses.
14 Except for Mongolia, where multiple interviews were conducted.
15 How pastoralism and conservation policies intersected during the pandemic is explored in a forthcoming publication.

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13 Alternative perspectives

A bright side of natural resource governance in drylands

Annemiek Pas, Tobias Haller, Irene Blanco-Gutiérrez, Troy Sternberg, and Patrick Meyfroidt

Introduction

Community-based governance of natural resources in the drylands has often been studied from the perspective of failure. Using simplistic neo-Malthusian world-views supported by the Hardinian school of thought, it was argued that due to demographic growth and backwardness of dryland populations, the lands' carrying capacity is unavoidably reached at some point, leading to resource degradation, scarcity, and conflict, especially when resources are held in common (Boyd et al. 2018; Boles et al. 2019; see also Herskovits 1926; Hardin 1968). Even more, with current narratives around ongoing land degradation in the context of climate change, the scientific understanding of the governance of natural resources in the drylands is often framed through somewhat dystopian visions of the socio-ecological future (Swart et al. 2004; Reed and Stringer 2015 (UNCCD); IPBES; IPCC).[1] In contrast, large-scale projects such as the Great Green Wall[2] exemplify a counternarrative presenting an extremely optimistic but often simplistic vision of how to address degradation (following the negative colonial paradigm of the UNCCD, see also Davis 2016), climate change, conflict, and more (see also Chapter 7, this volume). Such visions, and related practices, are often insufficiently rooted in a proper understanding of the needs of heterogeneous local resource users and how to engage them in order to 'succeed'. In other words, initiatives such as the Great Green Wall are promising but probably slightly naïve and likely to fail if not building on participatory institution-building processes among multiple interest groups, as we show in this chapter.

More generally, such simplified paradigms have an enormous influence on donor- and government-driven development and policy interventions for the drylands, impacting people and nature, as became clear from other chapters in this volume. While it is important to critically understand the effects of such top-down development and policy interventions, it is equally important to show how people locally create, resist, craft, and negotiate towards outcomes that are beneficial to the governance of common-pool resources. Existing scientific insights, challenging hegemonic discourses of the drylands, have already shown how cooperative local communities can create rules and regulations that govern common-pool resources in a meaningful way (Berkes 1989; Ostrom 1990; Tiffen

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and Mortimore 1992; Fairhead and Leach 1996). More recently, a growing body of literature has started to explore stories of 'success' in relation to community-based governance of natural resources (e.g. Mortimore 2005; Galvin et al. 2018; Haller and Merten 2018; Sirimorok and Rusdianto 2020). Beyond questioning the prevailing narrative of degradation and conflict, this literature also proposes ways forward through identifying means to catalyze change towards more positive outcomes and showing that alternative futures are possible (Bennett et al. 2016). The positive elements of such examples can broaden the creative imagination of participants to move towards a 'future beyond dystopia' and thus be transformative (Slaughter 1998; Bennett et al. 2016; Pereira et al. 2018a, b; Scoones et al. 2020).

In this chapter, we contribute to the discussion on alternative perspectives to natural resources management in the drylands. We do so by presenting four cases of institutional (re)configuration of common-pool resource governance in dryland contexts that are viewed by the current resource users as positive, in the sense that these users agree with either the current set of institutions or agree with the planned course of action in order to reach a desired set of institutions. Using these cases, we investigate both the process of change as well as the outcomes, in order to understand under which conditions the different institutional (re)configurations took place (Galvin et al. 2018). We then unpack these conditions according to the six elements of the constitutionality approach, which focuses on the analysis of institution-building processes in common-pool resource management by local actors (Haller et al. 2016a, 2018). This approach to study bottom-up institution building through local agency and local perceptions was developed as a critique on top-down approaches to natural resource governance. Haller et al. (2016a) compared four case studies from Africa, Latin America, and Asia, where, despite high power asymmetries among different local interest groups, a process to create new institutions for resource governance was initiated. During the different processes, all interest groups were involved and got a feeling of ownership over the institution-building process, which resulted in perceiving the institutions as their own. From each case described in Haller et al. (2016a), six elements stood out to create such a process: (1) Emic problem perception, (2) Participatory processes addressing power asymmetries, (3) Pre-existing institutions, (4) External catalyzing agents, (5) Recognition of local knowledge/innovations, and (6) Higher-level authority recognition. In each case, there were clear power asymmetries between the participants, but these were balanced out through basic rules that provided a neutral platform for discussions. The different actors gained the feeling that they were part of a collective crafting process, which also created an understanding of a fair distribution of rightful shares (see also Ferguson 2015). Further cases using this approach confirmed the importance of these elements (see Haller et al. 2018) but also highlighted that such an emically shaped bottom-up process depends on the bargaining power of local actors and the economic context related, for example, to the rise of the value of a resource or a resource area.

While presenting the cases in this chapter, we maintain that the explicit factors and elements contributing to such positive pathways are highly context-specific and might differ radically in terms of process and outcome, but we nevertheless

aim to identify similar underlying elements of (fragments of) the positive perspectives on institutional change and resource governance in the drylands. The cases include elements of local reactions, visions, and enactments as ways to reach more locally desired presents and futures. The cases range from situations where people were forced by the State to propose new institutions, to contexts where the State shows failure and leaves room for local collective action.

Spain: crafting own rules for sustainable groundwater management

The Eastern La Mancha aquifer is the largest aquifer in the Iberian Peninsula and one of the largest aquifers in southern Europe. The aquifer is located in the Upper Júcar River Basin. It extends over 7,200 sq km, covering the easternmost part of La Mancha region, a relatively flat area in the southern highlands of central Spain (CHJ 2021). The area has a Mediterranean climate, characterized by hot arid summers and seasonally restricted precipitation. Rainfall is low, around 350 mm/year (Recio et al. 2005).

Irrigated agriculture is the most important water use sector, accounting for about 90% of the annual water withdrawals. It is also a major source of income in this area, still predominantly rural, where the working population engaged in farming is 30% (Esteban and Albiac 2012). The aquifer supports irrigated agriculture, with a large land area, close to 120,000 ha, which yields around 350 million Euros of annual revenue (JCRMO 2018). Agricultural production is based on the cultivation of cereals (wheat, barley, corn), which accounts for almost 50% of the cultivated area, permanent crops (vineyards and almonds) (30%), and highly profitable horticultural crops (garlic, onion, lettuce, broccoli) (20%) (JCRMO 2018). Crops are watered with modern irrigation techniques (mainly sprinkler and centre pivot systems) on 80% of the irrigated land (De Santa Olalla et al. 2007).

The socioeconomic development of the region over the last 40 years was a result of the increasing use of groundwater for irrigation (Recio et al. 2005). Intensive development of irrigated agriculture started in the late 1970s and led to significant exploitation of the aquifer (Reig et al. 2018). Aquifer exploitation grew from 140 hm^3 in 1982 to 377 hm^3 in 1996 and to 433 mm^3 in 2000, largely exceeding the estimated renewable resources (320 hm^3 per year of water allocated to the area by the Júcar River Basin Plan) (Custodio et al. 2019). This resulted in a continuous drop of the groundwater level and a reduction of discharge to the Júcar River. Considerable damage was inflicted on the aquatic ecosystems of the Upper Júcar and downstream users in the Lower Júcar because of the reduced river flows (Custodio et al. 2019).

In view of this situation, the central government of Madrid threatened to declare the aquifer as overexploited and establish a far more restrictive system of water entitlements (as in the neighbouring Western La Mancha aquifer). This, along with other factors such as the pressure from downstream users to maintain river flows and the increase in pumping costs because of the fall of the aquifer water table, motivated the cooperation efforts by farmers to engage in active

negotiation (Esteban and Albiac 2012; Domínguez et al. 2017; Custodio et al. 2019). In addition, the relatively small number of farmers involved (around 1,500), the creation of social capital, successful leadership, and the high self-esteem and self-determination of farmers in the aquifer fostered collective action (López-Gunn 2012).

In 1995, farmers organized themselves into the Central Irrigation Board of La Mancha Oriental (JCRMO, a Spanish acronym), to collectively manage local water bodies and achieve a sustainable use of their resources (JCRMO 2018). The farmers were involved in the institution-building process, with an active role in enforcement and control, resulting in active and conscious cooperation in the management of the aquifer. Joining efforts with the state administration, the regional government, the local university (Universidad de Castilla-La Mancha), and local research institutes, the JCRMO was able to manage, control, and coordinate irrigation uses.

Irrigators agreed to reduce water extractions and established advanced technological mechanisms to control and monitor groundwater use (Custodio et al. 2019). The volume of water that can be used for irrigation in the aquifer is variable every year and is subjected to an 'Exploitation Plan'. The Júcar River Basin Authority establishes the maximum quantity of water to pump according to the progression of the groundwater levels. Then, the JCRMO distributes this quantity of water among its members and monitors the use of the allocated resources (Domínguez et al. 2017). The JCRMO uses multi-temporal satellite imagery and field data to map land uses and estimate irrigation water needs of cultivated crops. This information is then used by the JCRMO to assign water exploitation rights to farmers, according to their cropping pattern and farm size, and to monitor water consumption and the enforcement of the Exploitation Plan. Moreover, the JCRMO conducts regular field inspections and surveillance of the water quality and quantity, and sanctions are applied when water usage exceeds given water rights (JCRMO 2018).

This water management system, developed in partnership with the other actors, has been key to the decrease of groundwater extraction in the Eastern La Mancha aquifer. In the 2010s, extractions stabilized at around 300 hm^3 per year and the aquifer levels have returned to their sustainable levels (Ortega-Reig et al. 2018). The average overdraft (100 hm^3) in previous decades has been eliminated. As a result, farmers have recovered their historical water rights on 95% of the territory, and they have regained confidence in the distribution system, which discourages new, non-authorized cultivation (JCRMO 2018).

The Spanish case study supports the idea that adequate groundwater management can be achieved by the cooperation of local actors through active engagement with processes of institution building as well as control and enforcement, as ways to generate a feeling of ownership of the institution to make it legitimate (Saleth and Dinar 2004; Esteban and Albiac 2012; López-Gunn 2012). The Eastern La Mancha aquifer is an exceptional example of successful collective action for sustainable management of a common-pool resource. It proves that achieving cooperation and engagement of farmers is a realistic and feasible alternative that

could be valid for promoting sustainable management of other large aquifer systems worldwide.

Mali: challenging the discourse of deforestation with local integrative conventions

Benjamin (2008) presents a case from the Tarabé River area in Mali, describing the example of a village called Senoré, which is located on the western bank of the Tarabé River and is part of a large commune called Dioptodji (encompassing 61 villages). Different ethnic groups living in Senoré (Bambara, Rimaybé, and Bella) had developed institutions in precolonial times to govern flooded pasture areas and an adjacent gallery forest as a complex 'cultural landscape' (Haller 2019), which was intensively secured and sanctioned. Farmers and pastoralists from neighbouring villages were allowed to use the forest for collecting gum and leaves, and people from Senoré were allowed to reciprocally use other pastures in times of need; fishing communities (Rimaybé and Bella) of the village also fished collectively with fishermen from other villages (Benjamin 2008: 2266).

However, challenges to this system of reciprocity grew after colonial times, because local Bambara as well as external timber businessmen became interested in cutting *doum* trees (palm) in the forest close to the river. Although people from Senoré, mainly from the Bambara ethnic group, could be stopped from cutting the trees by existing institutions (which they respected), traders from outside of the area claimed that they had the right to the forest based on their national identity as citizens and that they had obtained permits from the government to gain access to the forest. Frustrated with this situation, the inhabitants from Senoré stopped protecting the forest, which attracted the American NGO New East Foundation (NEF) to launch an initiative for a local convention (called Waldé Nema Tarabé) to protect the forest. This was made possible because of the decentralization process allowed by the Malian government at that time. Besides the role of this NGO in trying to bring the different ethnic groups into a negotiation process, reciprocal rights already present in local common-property institutions played an important role in this process of constitutionality. NEF initiated meetings in several villages to discuss the way the forest should be managed according to local people, while being consistent with formal legal frameworks. It became obvious from this consultation process that forest protection goes hand in hand with the management of other resources. As only a small number of villages in the commune had *doum* forests, and other villages that did not have *doum* were still dependent on its products, institutional arrangements based on an exchange of other resources, such as access to fisheries and pastures in return for *doum* products, had already been installed in precolonial times. Therefore, it was clear from a local perspective that forest protection would entail taking into account all the resources in the area: fisheries, gallery forests, wetland pastures, and agricultural land. Based on

this insight, an association was formed to discuss the joint management of all these resources. In addition, a convention for the management of all common-pool resources in this area was prepared. NEF facilitated the meetings of this association, as well as meetings with local government and technical agents. On the basis of a rather slow process, NEF helped the involved communities in the area to reach a consensus for the governance of the cultural landscape ecosystem and sign a written agreement. This agreement was based on the previously developed institution of reciprocity among the villagers and different ethnic groups. The agreement, overseen by the Forest Service, included the negotiated and locally accepted five-year restriction of parts of the *doum* forests and the right of the water shaman to close and open the fisheries, as well as indicating important breeding grounds for fish and banning certain seine net techniques. Flooded pastures were zoned for local cattle and managed by village chiefs, who were held accountable during public meetings after prayers in front of the mosques. This convention worked because the diverse local stakeholders were involved in the negotiation process and could provide inputs to the convention. Problems were openly debated, including those concerning the legitimacy of rule-making—for example, with regard to the first-comer rule (i.e. ownership rules are justified with the discourse of being the first ones in an area). The NGO was perceived by the different interest groups, who wanted to have a new institutional setting, as a neutral actor that facilitated the discussion and the decision-making process. Despite having little if any real influence on the content of the institutional design, this NGO provided an important common good: a secure framework for negotiations and, after a halt to negotiations due to conflicts, helping to bring the people back to the negotiation table.

Several aspects underlie the perceived success and fairness of the institution-building process in this case. First, the process of negotiating this convention was successful in part due to the presence of a mediating body, the NGO NEF, who also had good contact with the state forestry service, which facilitated bringing all local actors to the table and sent a signal out to external actors (such as traders) that they needed to accept local rules. Also crucial to the process was the way in which a larger group of villages, of which Senoré was part, joined forces and increased their bargaining power vis-à-vis State authorities, which were then forced to participate and listen to local voices. It is also clear that the existence of pre-existing institutions based upon reciprocity was helpful in this process. This was a point of reference on how to deal with complex resource governance and also included ways of negotiating these institutions. In addition, it seems that despite the hierarchical nature of village societies in Mali, the accountability and transparent nature of the negotiations helped in the institution-building process by creating a sense of ownership over the process. However, it has yet to be seen whether and how the convention will remain as the basis for further discussions, and how further interactions with more powerful groups and with the State will unfold. In addition, the case study is silent with regard to gender issues and socio-political differences among villages.

Israel: halting degradation of forestry by shaping UNESCO rules in Mount Carmel

Eid and Haller (2018) describe how, in present-day Israel, the Druz ethnic and Islamic religious groups in the Mount Carmel dryland area were maintaining and using the commons of this area for silvo-pastoral use for centuries. In fact, the area has developed into a cultural landscape because of olive tree farming and forest-pasture management based on local common-property institutions that ruled the sustainable use of these common-pool resources. A central feature was that undergrowth was reduced in this way, and fire, as an important threat in dryland ecosystems, was therefore reduced. However, with the building of the Israeli State these communal property rights were not acknowledged and the State declared the area to be state property. The area was later privatized and came to be owned by Israeli investors for fast-growing eucalyptus plantations, so the silvo-pastures in the forests could no longer be used. This process of commons grabbing was combined with the forced inclusion of Druz men into the Israeli army, using the argument that they should not complain since they were being given Israeli citizenship. Thus, the state argued that the Druz had to surrender these territories as a way to receive recognition as Israeli citizens. External control of the area was further entrenched in the 1990s as Mount Carmel became a protected area under the direction of the UNESCO Biosphere programme under the control of the State. Local people were not consulted and were overridden by this decision, which again reduced the use of the former commons drastically with new conservation measures, akin to a 'green grabbing' intervention (see Fairhead et al. 2012; Gargallo et al. in this volume). The lack of local ecological knowledge as well as the undermining of the common property of the forest area led to the poor maintenance of the forest, as it was no longer used as a silvo-pasture. In consequence, too many dry leaves and branches were left lying on the forest floor, increasing the danger of a large fire and hence an environmental crisis. In addition, some areas covered with olive trees formally belonging to the Druz were given to Israeli farmers who planted eucalyptus trees, which burn much faster than olive trees. On 2 December 2010, a huge wildfire devastated a large part of the Mount Carmel forests. Apart from the non-removal of the undergrowth in the forest because it was no longer being used as silvo-pasture, the extension of flammable eucalyptus plantations exacerbated these fires.

The failures of the Israeli state, represented by its forest department, to maintain and protect the forest became obvious to different Druz groups and boosted further bargaining power for local successful actions later on. Strategic actions followed when different groups began discussing how to retrieve governance rights using the framework of the UNESCO Biosphere Reserve. The Druz pointed to the devastating outcome of the commons-grabbing process by the State as well as to the State's ignorance of local ecological knowledge. The Druz decided to claim vis-à-vis the State and UNESCO that they are indigenous people, that they have the knowledge to manage the land, and that the UNESCO Biosphere arrangement includes participatory rules stipulating that local inhabitants of an area have to be involved in the design and management of the reserve. This formal institutional option for

local participation in the UNESCO framework, which was previously ignored by the Israeli State, gave the Druz the option to regain control over the Mount Carmel area following the large fire incident. Thus, the failure of the State's forestry department increased the Druz's bargaining power, which the Druz used in a way by jumping scale regarding forestry governance by setting up and negotiating new institutions for the governance of the Mount Carmel area with the State, referring to the UNESCO rules. This meant that the State had to recognize them as legitimate actors managing the Mount Carmel area. They did so by combining old rules to access pasture, but also by replanting olive trees in some of the areas given back to them. In this way, they regained some of their former commons. In addition, the old use rules and new regulations based on the UNESCO scheme were widely discussed and adopted. Thus, in a situation of lower bargaining power, the State could still be challenged, as it was failing to address critical local problems and the Druz are once again able to manage the forest and olive areas.

Kyrgyzstan: halting mining, pressuring the government, and defending pastures

On 5 August 2019, 500 local herders and villagers stormed the Solton Sary mine compound in Naryn Province, Kyrgyzstan (Putz 2019; Moldalieva and Heathershaw 2020). Rocks were thrown, fences breached, vehicles overturned, and 28 Chinese mine workers were hospitalized (Radio Free Europe 2019; SCMP 2019). Captured by smartphone, the video was viewed 95,000 times on YouTube (2019). The army was called in, remaining workers evacuated, the mine closed, and Zhong Ji, the Chinese mining company, demanded reparations from the Kyrgyz government. A series of unresolved disputes with the mining company over land degradation, pasture fragmentation, fencing, and water pollution led to violent protest that sent a message about perceived injustice, exploitation, and degradation at the mine. The residents, herders, and previously artisanal miners were blocked from pastures and land access. This affected community ability to practice livelihoods and increased Sinophobia, with the government viewed as supporting the Chinese over its own citizens. The incident, with a few arrests and a notable media attention, successfully accomplished the local objective of stopping the mine. As if to confirm this, the 'Ambassador Extraordinary and Plenipotentiary of the People's Republic of China to Kyrgyzstan' Du Dewen stated that the incident 'brought huge economic and physical losses to the company', and then demanded that the government 'conduct a thorough investigation of the incident, strictly punish the perpetrators and fairly and appropriately resolve the situation' (24KG 2019: 1). Although the rhetoric was strong, as of 2021 the mine remained closed and protesters were not detained. This single episode showcases the conflict and contestation of Chinese mining infrastructure in Central Asia.

In fact, the violence at Solton Sary mine became a catalyst event for further protest in the province capital. On 17 February 2020, the agreement for a $275 million Chinese logistics centre in Naryn city was terminated owing to repeated

protests (Shailoobek 2021; Putz 2020). Although agreed with Chinese President Xi Jinping in Bishkek at the June 2019 Shanghai Cooperation Organisation meeting, the Kyrgyz–Chinese Ata-Bashi Free Trade Zone Joint Venture stated that the investment contract had been cancelled because 'it is not possible to work on a long-term large project under the circumstances' (Putz 2020: 2).

Here, we see the power of mining protest to morph and mutate into serious public disruption of state-to-state cooperation. Years of efforts at local bargaining or dispute resolution had failed in Solton Sary. Residents saw their livelihoods and environments threatened, while the State was backing both the Chinese mine and logistics centre. Threats and acts of violence became the community's way to shut down Chinese operations and expose the government's inability to resolve or control conflict.

Mine closure and termination of foreign investment reflect the importance of scale: if public protest and anger are great enough, the government is forced to acquiesce to citizen demands. Such a test occurred during demonstrations over politics and COVID-19 in the capital in March 2020; these protests were quashed by hundreds of policemen (Reuters 2020). Here, in the locus of government, representatives of the State were able to maintain control at the time. In Naryn, remote from the centres of power, the State had been unable to control local protests or enforce its writ. Rather than protests and resulting processes leading to institutional reconfiguration, a fraudulent election took place in October 2020, which then led to massive street protests as the national government collapsed.

In Naryn, the community viewed the mine closure as a success: mining stopped and the Chinese left. The action was reactive; there was little hope or expectation that a different company or the weak State would improve local conditions. Rather than a vision for the future, the residents returned to the familiar status quo. At least then decisions would be taken locally in customary family-driven processes. As of writing (2022), the mine remains closed.

Catalysing agents, institutional memory, and self-determination

While the cases and their related understanding of being a success are highly context-dependent, each case provided in this chapter has interpreted successful processes of institution building as (re)gaining control over the governance of resources, providing the ability to craft local rules—in line with the six elements of the constitutionality approach—and as such to stop or invert negative social-environmental impacts. In Spain, the weak enforcement of existing top-down rules resulted in aquifer exploitation and damage to the associated aquatic ecosystems. Local farmers, committed to saving their livelihoods, looked for cooperative solutions and organized themselves in an irrigation board to collectively manage water bodies and achieve sustainable use. Supported by external actors (the State administration, the regional government, the local university, and local research institutes), irrigation and water usage are currently controlled by the irrigation board. Using advanced technological mechanisms, the board distributes available water among its members and monitors the suitable use of the allocated resources,

with active support in the process of management and control by the farmers. In Mali, reciprocal rights of access among farming, pastoral, and fishery communities had come to a halt when the resources were opened up by the government for external use. Here, with the support of an NGO, an association was formed to discuss the joint management of fisheries, gallery forests, wetland pastures, and agricultural land to protect the forest. A convention was prepared and a written agreement was signed, based on the institution of reciprocity among the villagers and different ethnic groups to manage *doum* forests, water and fisheries rights, and flooded pastures. In Israel, the failure of the State to comply with UNESCO Biosphere rules of conservation provided space for the Druz to discursively challenge the State and regain control over a privatized space, which was previously part of the commons, through a formal regulation that stipulated the Druz should officially be part of the design and management of the area. They did so by combining old rules to access pasture, but also by replanting olive trees in the area and thereby regaining the commons. In Kyrgyzstan, the local community reasserted control over pasture and water. In rural Naryn, the cessation of large-scale mining created space for customary methods of control based on family and clan ties, with local government acquiescing to community demands.

Table 13.1 summarizes the institution-building processes of each case, using the six elements of the constitutionality approach: (1) Emic problem perception, (2) Participatory processes addressing power asymmetries, (3) Pre-existing institutions, (4) External catalyzing agents, (5) Recognition of local knowledge/innovations, and (6) Higher-level authority recognition (see also Haller et al. 2016a). These elements together pave the way for the (re)configuration of (fragments of) institutional change and resource governance in the drylands.

From each of these cases, the role of an external catalyzing agent either as trigger for change or as mediating or coordinating agent comes strongly to the fore. For example, in Mali, the NGO acted clearly as a mediator, while in Spain the Water User Association became de facto an internal mediator and broker for conflict resolution. It is not always necessary to have an active mediator. This is shown in the case with Israel, where UNESCO acts as a catalyzing agent by providing an institutional framework to support local institution building. Such catalyzing actors play an important role in the construction of a 'neutral' field for discussion.

In addition, in most cases, the State was key in triggering the processes of regaining control, followed by legal recognition from the same State. In the Spanish case study, the State threatened, then supported the development of new participatory water institutions. In Mali, the government provided permits to open up the locally managed region for access and use of resources by external parties, which made the NGO step in and assist in the creation of the convention, which in turn was later recognized by the State. In Israel, somewhat similar to the case in Mali, the State changed the property relations of the region, leading to privatization of previously common-used land and resources, with destructive results. This, however, opened up space to challenge the State, which was acting against its own (UNESCO Biosphere) rules. This opening up and use of negotiation space

Table 13.1 Institution-building processes per case using the six elements of the constitutionality approach

	Emic problem perception	*Participatory process*	*Pre-existing institution*	*External catalyzing agent*	*Recognition of local knowledge*	*Higher-level authority recognition*
Spain	Restrictions on water entitlements; Need to gain control over water distribution	Collective process of crafting rules	Water entitlements poorly managed and controlled by the State	State; regional government; university; local research institutes; Júcar River Basin Authority	Water users (farmers, municipalities, and industrialists) considered knowledgeable about proper water management	State
Mali	Loss of access to and control over locally used resources	Collective process of crafting rules, ample negotiation space, rise of bargaining power, acknowledgement of existing rules	Reciprocal access	NGO NEF, Forest Service	Clearly in place and acknowledged as part of the local convention, which built in pre-existing rules of reciprocity	State rules (conventions) for own means for recognition by the State; mosque; Forest Service
Israel	Loss of access to and control over locally used resources; State failure in conservation	Collective process of crafting rules and raising bargaining power	Common use	UNESCO with its option for participation, and local leaders realizing this	Druz considered as indigenous people with important local knowledge for proper management and conservation of the area	UNESCO and, after the fire incident, the State
Kyrgyzstan	Mining	Rise in power by collective protest and violence	Local use	Chinese mine	–	State

returned the area to the commons, with an important role for local knowledge in its management, and this was recognized by the State.

Furthermore, what we see from all cases is the importance of a strong institutional memory, which not only includes the use and acknowledgement of pre-existing rules—as in Mali and in Israel where old common rules are recovered or reconstructed to form new institutions—but also encompasses the capacity to reflect and learn from experience, as in Spain, where farmers learnt from the experience of their neighbours (the failed top-down approach in the Western La Mancha aquifer). The Spanish case also illustrates the interaction between institutional change and technological change. Here, the use of advanced technological mechanisms provided new opportunities for institutional improvement.

A final prominent element, which is not explicitly considered within the six elements of the constitutionality approach but which stands out clearly in each case in this chapter, is the role of high self-esteem and self-determination of local agents. These high levels of self-esteem and self-determination seem to be important drivers for claiming space for active engagement towards the co-creation of institution building, as well as for the enforcement of agreed-upon rules. This, then, contributes to the existing six elements of the constitutionality approach with an important additional element: a positive identity process—which together with the six elements ensures a successful process and outcome of institution building.

Discussion and conclusion

In this chapter, we took a closer look at four cases where dryland populations found a way to actively and meaningfully engage with the (re)configuration of the institutions of the natural resources they use. The cases we presented include elements of local reactions, visions, and enactments as ways to reach more locally desired presents and futures. In general, we can say that in all these cases the positive perception is related to active participation in institutional development, as well as to active resistance (the basis for claiming space), and to active engagement in institution-building processes. The four cases presented show that the outcome is no longer top-down decided and implemented; instead, they show examples of people claiming and using space for actual and meaningful participation in resource governance. Our findings support the idea that institutions, when adequately designed, enhance community-based natural resource management. In cases where a binding social capital has been created and imbued with a positive collective memory, self-management (as described by Ostrom 1990) has been successfully achieved (López-Gunn 2012). In addition, local power asymmetries also need to be recognized and mediated, which is a central element in the success of bottom-up institution building (see Haller et al. 2016a).

We argue that the explicit factors and elements contributing to successful pathways are highly context-specific. However, we identified similar underlying elements in the (re)configuration of institutions. Applying the constitutionality

approach allowed us to tease out these similar elements, including the bottom-up participation to own the institutional crafting process, while taking into account internal and external agents, their roles and intertwined power asymmetries. In short, our main cross-case findings showed that, in order for institution-building processes to be labelled as positive by local actors, there is a need besides for the support of external catalyzing agents and institutional memory and recognition, and also for self-determination as an important element to claim space to actively engage with the institution-building process.

More importantly, in the drylands, which are known to be unstable, highly variable, and non-equilibrium systems, there is a pressing need to deal with constant uncertainty (Sullivan and Rohde 2002; Haller et al. 2016b; Scoones 2021), not just regarding climate and resources but also regarding power relations with other groups and the State. The recognition of locally developed institutions and generally recognized common property reduces this uncertainty and increases the bargaining power for heterogeneous local actors to propose their own institutional design and increase resilience (see Woodhouse et al. 2000; Homewood 2008; Haller 2019). Local participation in institution-building processes, through recognition of local knowledge and locally defined limits, allows for the incorporation of flexibility and as such the ability to handle uncertainty. Many institutions among pastoralists and farming communities show a more flexible principle of, for example, boundaries or rights to certain resources based on abundance and times of scarcity (Moritz et al. 2013), and on rules of reciprocity (Pas 2018; Haller 2020). This flexibility as well as resilience against internal and external socioeconomic, political, and ecological changes is a central aspect of the governance of resources in drylands (Bollig 2014; Watson et al. 2016). The four cases presented address exactly this issue, while showing how meaningful collective action in a historically, socially, and power-specific multi-complex context has been reached (see also Chapter 2, this volume).

While we argue that the explicit factors and elements contributing to successful pathways is highly context-specific—which makes it not straightforward to foster more of these examples in other places—ensuring the six constitutionality elements are expressed and/or present may be a way forward to promoting processes of successful institution building in other places with different contexts, power relations, and histories. The cases also illustrate the limits of our notion of successful institutional change, beyond their context specificity. First, as the Mali case illustrates, 'success' is seen as reflecting the visions of a large range of actors, but some actors may still end up being marginalized or some issues neglected in the institutional change, such as gender inequities or power differentials between villages or more marginalized pastoral groups in a local context (e.g. Fulani in the Mali case). Second, as illustrated by the Kyrgyzstan case, besides showing how conflict can be productive, a success can be only the first step in the institutional reconfiguration and in the way towards more desirable futures. In that case, the 'success' was essentially the stopping of undesired changes, but it remains to be seen if this can be turned into a mobilization to define a desired project for livelihoods and natural resource governance. The

way the State intervened was challenged, as in the case of Spain and Israel, but would the outcome be the same without international support and exposure? While internal contradictions and conflicts were temporarily resolved, this does not mean there will be no further contestations. As such, the timing and temporality of successful steps is important to take into account while analysing processes of institution building, since these are processes always in motion and constantly evolving as circumstances change, new challenges arise, and power balances shift; what is successful now may not be useful or considered positive in the future. A positive institutional change is thus best not seen as a complete, exhaustive, and definitive solution but as a movement in a more positive direction, which requires continuous 'work' to improve.

Notes

1 https://ipbes.net/assessment-reports/ldr; https://www.ipcc.ch/srccl/ [Both accessed 8 May 2021].
2 https://www.greatgreenwall.org/about-great-green-wall [Accessed 8 May 2021].

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Index

Note: **Bold** page numbers refer to tables; *italic* page numbers refer to figures and page numbers followed by "n" denote endnotes.