Environmental Discourses in Science Education

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Conceptualizing Environmental Citizenship for 21st Century Education

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Environmental Discourses in Science Education

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This series wrestles with the tensions situated between environmental and science education and addresses the scholarly efforts to bring confluence to these two projects with the help of ecojustice philosophy. As ecojustice is one of the fastest emerging trends for evaluating science education policy, the topics addressed in this series can help guide pedagogical trends such as critical media literacy, citizen science, and activism. The series emphasizes ideological analysis, curriculum studies and research in science educational policy, where there is a need for recognizing the tensions between cultural and natural systems, the way language is endorsed within communities and associated influence, and morals and ethics embedded in school science. Conversations and new perspectives on residual issues within science education are likely to be addressed in nuanced ways when considering the significance of ecojustice, defensible environmentalism, free-choice. Book proposals for this series may be submitted to the Publishing Editor: Claudia Acuna E-mail: Claudia.Acuna@springer.com

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Abbreviations

CE	Citizenship Education
CoP	Community of Practice
DSP	Dominant Social Paradigm
EA	Environmental Attitudes
EB	Environmental Behaviour
EC	Environmental Citizenship
ECn	Environmental Citizen
EE	Environmental Education
EEC	Education for Environmental Citizenship
EfS	Education for Sustainability
ESD	Education for Sustainable Development
FCN	Frequency of Contact with Nature
NC	National Curriculum
NEP	New Environmental Paradigm Scale
PSAs	Public Service Announcements
SE	Science Education
SSIBL	Socio-scientific Inquiry-Based Learning
STEM	Science, Technology, Engineering and Mathematics
TPB	Theory of Planned Behaviour
TPD	Teacher Professional Development
VBN	Values Beliefs Norms

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Chapter 1
Introduction to the Conceptualisation of Environmental Citizenship for Twenty-First-Century Education

Andreas Ch. Hadjichambis and Pedro Reis

1.1 Introducing Environmental Citizenship

The EU's growth strategy (Europe 2020) and the European vision for green, circular and low-carbon economy in line with the EU 2050 (EU-roadmap 2050) give particular attention to citizens' participation and engagement and therefore to Environmental Citizenship. Environmental Citizenship has been an influential concept in many different arenas such as economy, policy, philosophy, corporation management and marketing, which could also be better exploited and established in the field of education. Environmental Citizenship is recognized as an important aspect in addressing global environmental problems such as climate change (Stern 2011; Ockwell et al. 2009) whilst providing support to pro-environmental organisations and individuals, contributing also to public pressure for political action (signing petitions, writing to politicians and newspapers). Many varied definitions of Environmental Citizenship can be found within the literature. Some of them are quite similar, and important overlaps can be observed; however, others can be quite different with contradictions in their philosophy and approach. According to Dobson (2010), Environmental Citizenship refers to pro-environmental behaviour, in public and in private, driven by a belief in fairness of the distribution of environmental goods, in participation and in the co-creation of sustainability policy. It is about the active participation of citizens in moving towards sustainability.

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Education and especially environmental discourses in science education have a lot to contribute in adopting and promoting Environmental Citizenship. However, the conceptualisation of Environmental Citizenship in educational context remains an imperative need. The under-explored (until now) potential for pro-environmental behaviour change through Environmental Citizenship should be further emphasised (Dobson 2010) and can contribute greatly to a more sustainable world.

1.1.1 The Need for Environmental Citizenship

We are currently experiencing an unprecedented environmental crisis. A series of existing environmental problems (both global and local) constitute the scenery of the environmental crisis. Loss of biodiversity, climate change, ice melt, plastic pollution, ocean pollution, ocean acidification and desertification are just some of the global environmental problems that make up this environmental crisis. Moreover, at the local level, the environmental crisis is taking on other aspects such as habitat loss and habitat fragmentation, extreme urban development, overconsumption of natural resources and waste disposal. In addition to the current environmental problems mentioned, new environmental problems emerge, such as climate engineering, genetic pollution and genetic drift, water stress, extended air pollution and environmental health problems, many of which are controversial topics. Increasing pressures on the environment could cause irreversible damage within the next few decades (OECD 2008). The current inaction will have an enormous impact on the environment in 2050 (OECD 2012).

Taking into account the emergency of the environmental issues, a renewed and expanded Environmental Citizenship is needed to achieve positive outcomes for the environment. Environmental Citizenship could contribute to the solution of the current environmental problems and will prevent the creation of new environmental problems. Even though there are different interpretations of Environmental Citizenship, there is a consensus of the scholars within the academy that there is a need for an effective Environmental Citizenship (Barry 2006). Such an Environmental Citizenship could develop a more sustainable society and world with the transformation of the values, beliefs, attitudes and behaviour of individuals who see themselves as part of the global environmental politic (Barry 2006).

1.1.2 The Roots of Environmental Citizenship

Environmental Citizenship is originally derived from the political science arena. Many different approaches for Environmental Citizenship can be found in the scientific literature. According to Melo-Escrihuela (2008), the discourse regarding Environmental Citizenship can be classified into two main categories: the personal

duty or lifestyle approach and the participatory rights approach coming from both the liberal and republican political theories. The liberal approach gives emphasis on individual responsibility and on claiming rights to environmental goods, whilst the republican approach gives emphasis on participatory rights in decision-making, on deliberation, on civic participation and on the commitment to the common good.

There are also some other political approaches of Environmental Citizenship such as feminist, multiculturalism (pluralism) as well as cosmopolitan and neoliberal (globalism). Pluralism theories are adding to the political dialogue, the universalism and the exclusion of difference (Cao 2015). Within globalism theories, cosmopolitan Environmental Citizenship emphasises the interconnection and interdependence on a global scale beyond state boundaries (Beck 2010). Neoliberalism considers citizens as consumers; it advocates for the importance of corporations as agents of citizenship and is expressed mainly by the concepts of sustainable consumption, green consumerism and consumer-sensitive lifestyles.

These different political and philosophical approaches, which in many points seem to be contradicted, make the fostering of Environmental Citizenship by educational perspectives very complex and with unstable focus in its practical implications or educational practice.

1.2 The Need for Conceptualisation of Environmental Citizenship

To date, a set of similar environmental terms relevant to Environmental Citizenship have been developed and described in the educational literature, which are used each time with their own operational definition. Accordingly, concepts such as Environmental Citizenship (e.g. Dobson 2007, 2010), green citizenship (e.g. Barry 2006), ecological citizenship (e.g. Jagers and Matti 2010) and sustainability citizenship (e.g. Barry 2006) have not been clearly distinguished. Additionally, from an educational point of view, they are not clearly different in nature and they often have overlapping areas of interest among them. Therefore, the conceptualisation of the term Environmental Citizenship from an educational perspective seems to be an imperative educational necessity.

Furthermore, Environmental Citizenship is not elucidated defined in relation to other relevant concepts such as environmental education, environmental behaviour, environmental attitudes, environmental literacy, environmental knowledge, awareness, sustainability and sustainability education. The domain of Environmental Citizenship is complex. Environmental Evidence Australia's review (2012) concluded that agreement on what constitutes Environmental Citizenship and the most effective tools and approaches for implementing Environmental Citizenship are still emerging. The fragmented nature of the research findings and information related to Environmental Citizenship constrains their effective incorporation into good practices and policy frameworks in the educational context.

1.3 Environmental Citizenship and Education

Education has been shown to be a fundamental tool that can adequately contribute to behavioural changes in citizens, which can eventually be translated into aspects of Environmental Citizenship (e.g. Gunningham et al. 2004; Dietz and Stern 2002). According to Huckle (2014), there is an urgent need to provide young citizens with sources of hope in troubled times, and Environmental Citizenship can provide the hope that the urgent solutions needed against modern environmental challenges can be found. Environmental Citizenship is relevant with science education (SE), environmental education (EE), Education for Sustainability (EfS) and citizenship education (CE). Each type of education has something important to contribute to Environmental Citizenship through its specific approaches, dimensions and practices.

SE is often linked to citizenship. Many studies in science education underscore the key role of science education for promoting active and responsible citizenship, as well as the need for citizens to get involved in the decision-making processes concerning controversial socio-scientific and socio-technical issues (Roth and Désautels 2004). The inclusion of socio-scientific controversies in the science curriculum signifies a departure from the traditional science teaching into more contemporary approaches elaborating the discussion of ill-structured, open-ended topics (Kyza et al. 2018). Recently, the socio-scientific inquiry-based learning (SSIBL) framework proposed a model of concepts and practices central to inquiry, which supports teachers with integrating citizenship in science classes (Levinson 2018). The European Commission report 'Science Education for Responsible Citizenship' (Hazelkorn et al. 2015) identified the main issues involved in helping all citizens acquire the necessary knowledge of and about science to participate actively, responsibly and successfully in and with society throughout their lives. It also provides insights on how science education can help Europe achieve its goals and empower people with the skills and competences needed to deliver sustainable and competitive solutions to these challenges. Environmental problems in many cases are such complex and controversial socio-scientific issues, and students should be inducted in how to critically approach them.

In the frames of EE, many scholars argue that the ultimate goal of environmental education is to develop students' ability to act as informed and empowered citizens (e.g., Schulser et al. 2009; Chawla and Cushing 2007), and other scholars invoke environmental education as a safe way to promote Environmental Citizenship (Carlsson and Jensen 2006; Gough and Scott 2006). However, according to other scholars (e.g. Schild 2016), there still remains a lively disagreement about the aims of environmental education, which may lead to conflicting goals and outcomes. Tidball and Krasny (2010, p. 2) stated that 'some models of environmental education may even have contradictory pedagogical approaches'. Such ambiguities in targeting and priorities can act as a barrier to the effective implementation of the Education for Environmental Citizenship (EEC). In addition, many research efforts in the frames of environmental education focuses on the individualistic approach

through which the ultimate goal is to achieve behaviouristic alterations in terms of the individual. For decades, a great deal of effort has been given to understand environmental behaviour, and several models have been proposed in the literature (e.g., Roczen et al. 2014; Corral-Verdugo 2002; Gräsel 2001). Many educational efforts have been undertaken to understand and improve the environmental behaviour of citizens. However, such models have never been elaborated in the greater framework of Environmental Citizenship. According to Chawla and Cushing (2007, pp. 9–10), 'Environmental education … typically emphasise[s] private sphere environmentalism at the expense of preparing students for public action'. However, Environmental Citizenship has the collective action as an intrinsic dimension, apart from the personal action in a private and public sphere. This dimension of Environmental Citizenship is often not the focus of educational efforts in the context of environmental education. Many researchers (e.g. Schild 2016; Barry 2006) have advised that we need an educational model that can promote the type of strong Environmental Citizenship and to move beyond an individualistic and behaviourist approach to more deliberately integrate an Environmental Citizen's engagement in civic participation and collective action into environmental education practices.

EfS promotes three interconnected pillars of sustainability: environmental, social and economic sustainability (UN 2015). In EfS, the concept of citizenship is just 1 of the 20 key themes of sustainable development, and Environmental Citizenship is therefore not the focus in many of the approaches. In addition, there is a recorded criticism regarding under-exploiting the social dimension and issues related to social justice and socio-political engagement of active citizens (e.g. Du Pisani 2006). In addition, several approaches are trying to incorporate citizenship in EfS and are attempting to find common ground between Global Citizenship Education (GCE) and Education for Sustainable Development (ESD) (e.g. Hoskins 2016).

Finally, CE in many curricula around the world has its own contribution and is considered important in understanding how citizens could become politically empowered and active and how society is governed. Kerr (2000) points out the difference between 'passive and historical' and 'active and critical' citizenship education. A useful framework to represent the dimensions of critical CE is proposed by Johnson and Morris (2010) in which politics, social, self and praxis represent the component elements of critical citizenship education. In addition, international assessment studies regarding citizenship education such as ICCS (2009, 2016) gave some cover in environmental issues. However, Environmental Citizenship is not in the focus of these important studies (Schulz et al. 2016).

As can be seen from the above argumentation, Education for Environmental Citizenship has never been put into the spotlight of the literature, and it has rarely been placed at the heart of the educational efforts in the context of environmental education, science education, citizenship education and sustainability education. Therefore, there is a need for an education that will have Environmental Citizenship as its prime concern and ultimate aim. Education for Environmental Citizenship could be considered to act as this type of education.

1.4 The European Network for Environmental Citizenship as a Community of Practice

The European Network for Environmental Citizenship (ENEC) – funded as a COST Action (CA16229-Horizon 2020) – brings together more than 120 experts from 37 countries with the objective to improve the understanding, the practice and the assessment of Environmental Citizenship in Europe and the participating countries. This large network bridges different fields of science and research communities so that access to more projects, experiences and perspectives can be acquired. This multi-national and multidisciplinary research context intends to bridge the gaps between human, economic, social, political and environmental sciences and to create exciting opportunities for exploiting synergies between different stakeholders (researchers, scholars, teachers, practitioners, policy officials, NGOs, etc.) regarding knowledge, expertise, research and insights of Environmental Citizenship. The ultimate objective of this national, European and international collaboration is to promote Education for Environmental Citizenship as an area of research and as a social and educational practice worldwide.

ENEC can be labelled as a community of practice (CoP): a group of people who share a concern or a passion about something they do and are learning how to do it better as they interact regularly (Wenger-Trayner and Wenger-Trayner 2015). This European network presents several of the characteristics identified by Wenger (1998, 2010) in a CoP:

- A shared interest – In ENEC's case, all members share a common interest in the promotion of Environmental Citizenship as a way to guarantee a more sustainable future.
- A dynamic negotiation of meaning – The network promotes the interaction between different researchers and stakeholders and the analysis of the literature in order to develop a common language and a common understanding/definition of Environmental Citizenship. This meaning-making process inside ENEC's community of practice implies both participation (discussions, meetings, scientific training schools, short-term scientific missions, conferences) and reification (documents, processes, methods, definitions, educational framework, collaborative working papers, scientific reports, proceedings, academic publications, policy and recommendation papers and an edited book on Environmental Citizenship). This way, the CoP contributes to and expands both knowledge and resources (Wenger 2010). Environmental Citizenship implementation requires a shared understanding of the concept by all stakeholders and the development of knowledge in implementing this approach.
- Shared ways of engaging in doing things together – Both the definitions (e.g. Environmental Citizenship) and the educational framework for the Education for Environmental Citizenship developed collaboratively by the network members are being used to frame a research, educational and social action agenda.

Together, the members from different areas of knowledge are developing new research paradigms and metrics for assessing Environmental Citizenship. At the same time, ENEC fosters the growth of a specific research and social practice through the initiation and support of those entering the practice by those considered 'experts' in that practice, in a process grounded in mutual respect and the desire to contribute to the practice (Lave and Wenger 1991). The CoP shares a common interest and passion and creates its own knowledge and resources.

- A rapid flow of information and innovation – The development of an interactive platform for communication and exchange of information regarding research and evidence-based interventions targeting Environmental Citizenship, combined with the use of digital collaboration and communication tools and the frequent meetings (working meetings, scientific training schools and short-term scientific missions), assures the constant and fast contact between the network's members. The interactive platform intends to overcome what is considered as one of the major threads to the implementation of ENEC's approach: the availability of resources. In spite of existing several learning materials and programmes on Education for Environmental Citizenship proposed by different organisations, these resources are dispersed through a multitude of places. Therefore, the interactive platform 'GAIA Repository Database' concentrates relevant information in one specific and dedicated space, aiming to become a major forum of discussion and dissemination regarding Education for Environmental Citizenship.
- A shared knowledge of each member competences – The members' different competences are being mobilised towards the network's goals, providing a richness of knowledge and perspectives. The promotion of Environmental Citizenship requires an interdisciplinary, collaborative and systemic approach difficult to materialise in schools strongly organised or divided around subjects. ENEC is providing the common spaces and times needed to develop synergies among different knowledge, perspectives and specific cultures.
- The development of an identity – all the interactions and collaborative work inside the network are allowing the development of an identity through the accumulation of experiences, stories, classroom materials and ways of addressing recurring problems, knowledge and competences connected with fostering Environmental Citizenship.
- A shared discourse reflecting a certain world view about the importance of citizens' pro-environmental behaviour change – through Environmental Citizenship – in order to aim for a more sustainable world.

ENEC is being fostered as a CoP through three key elements highlighted by the literature (Sherer et al. 2003; Wenger et al. 2002): (1) *domain*, the shared repertoire of knowledge and competences; (2) *community*, the interaction and the collective learning through joint activities and discussions; and (3) *practice*, the shared repertoire of resources developed by the community.

1.5 ENEC Definitions: EC, EEC and ECn

The European Network for Environmental Citizenship (ENEC) has set the following definitions for 'Environmental Citizenship' (EC), 'Education for Environmental Citizenship' (EEC) and 'Environmental Citizen' (ECn). These definitions were agreed after discussions from more than 120 researchers and scholars from 37 countries. The ENEC's definitions provide a concrete base on the conceptualisation of the Environmental Citizenship for twenty-first-century education.

'Environmental Citizenship' is defined as the responsible pro-environmental behaviour of citizens who act and participate in society as agents of change in the private and public sphere on a local, national and global scale, through individual and collective actions in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability and developing a healthy relationship with nature. 'Environmental Citizenship' includes the practise of environmental rights and duties, as well as the identification of the underlying structural causes of environmental degradation and environmental problems and the development of the willingness and the competences for critical and active engagement and civic participation to address those structural causes and to act individually and collectively within democratic means, taking into account inter- and intra-generational justice (ENEC 2018a).

'Education for Environmental Citizenship' is defined as the type of education that cultivates a coherent and adequate body of knowledge as well as the necessary skills, values, attitudes and competences that an Environmental Citizen should be equipped with in order to be able to act and participate in society as an agent of change in the private and public sphere on a local, national and global scale, through individual and collective actions in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing a healthy relationship with nature. 'Education for Environmental Citizenship' is important to empower citizens to practise their environmental rights and duties, as well as to identify the underlying structural causes of environmental degradation and environmental problems, develop the willingness and the competences for critical and active engagement and civic participation to address those structural causes and act individually and collectively within democratic means, taking into account the inter- and intra-generational justice (ENEC 2018b).

'Environmental Citizen' is defined as the citizen who has a coherent and adequate body of knowledge as well as the necessary skills, values, attitudes and competences in order to be able to act and participate in society as an agent of change in the private and public sphere on a local, national and global scale, through individual and collective actions in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing a healthy relationship with nature. An 'Environmental Citizen' is a citizen who practises his/her environmental rights and duties, is able to identify the underlying structural causes of environmental degradation and

environmental problems and has the willingness and the competences for critical and active engagement and civic participation to address those structural causes and to act individually and collectively within democratic means, taking into account inter- and intra-generational justice (ENEC 2018c).

Based on the above definitions, when we refer to Environmental Citizenship in the following chapters, we refer to an umbrella concept which covers all the different interpretations and views of the relation between environment and citizenship (e.g. green citizenship, sustainability citizenship, ecological citizenship, etc.) rather than just the liberal interpretation of Environmental Citizenship. We consider it important to have only one umbrella term (Environmental Citizenship) from the educational point of view. In addition, it is important to clarify that terms 'citizen' and 'citizenship' are not marginalizing any individuals who are not legally deemed to be citizens of a specific state or country.

1.6 The Structure of the Book

This book is organised in four complementary parts. Part I refers to the political, economic and social dimensions of Environmental Citizenship. Part II examines Environmental Citizenship as a psychological concept. In Part III, Environmental Citizenship is examined in the context of environmental education and education for sustainability. Finally, in Part IV Environmental Citizenship is discussed in different educational levels: primary and secondary formal and non-formal settings.

Part I begins with Chap. 2 about the "Political Dimensions of Environmental Citizenship". In this text, Ralph Levinson and his co-authors analyse the relation between conceptions of Environmental Citizenship and different models of sustainability. Some metaphysical and ontological questions about the relationship between Mind and Nature raised by divergent ideologies are discussed in this chapter, together with several fundamental implications for education and citizenship.

Chapter 3 discusses the relationship between economics and the environment, with a special focus on the environmental consequences of the widely applied principles of mainstream economics. Vladislav Kaputa and his colleagues argue for an interdisciplinary approach as a possible way to overcome the political and social barriers that prevent the transformation of economic systems. Environmental Citizenship is presented as a major element in shaping individual attitudes and values with a positive impact on consumer behaviour and, consequently, in the environment.

In Chap. 4, Ivan Sulc and his co-authors examine the role of Environmental Citizenship in selected aspects of human activities – urban development, transport systems, tourism and cultural heritage. The chapter analyses the relation of Environmental Citizenship, urban development and cultural landscapes. Sustainable transport is suggested as a way of reducing the transport disadvantage of marginalised social groups. Cultural heritage is identified as a new fourth pillar of sustainable development (along with environment, economy and society), and its role in

Environmental Citizenship is investigated. Finally, sustainable tourism is reviewed using new approaches in tourism that adopted elements of Environmental Citizenship as a reaction to unsustainable mass tourism.

In Part II, Environmental Citizenship is examined as a psychological concept. This part begins with Chap. 5 centred on the relationships between knowledge and Environmental Citizenship. In this text, Marija Smederevac-Lalic and colleagues present knowledge as an essential element in influencing pro-environmental behaviour and, consequently, in developing Environmental Citizenship. They explore what knowledge is necessary for an Environmental Citizen to cultivate coherent and adequate skills, values, attitudes and competences. Finally, they suggest a process of co-production of new knowledge between experts and key citizens as central to the idea of a participatory approach towards developing Environmental Citizenship.

Audra Balunde and her co-authors of Chap. 6 discuss how beliefs and values relate to Environmental Citizenship and how these aspects can be targeted in order to educate Environmental Citizens worldwide. In their opinion, understanding how values and beliefs relate to Environmental Citizenship would allow for evidence-based ways of promoting Environmental Citizenship in schools and communities.

In Chap. 7, Nicole Bauer and colleagues analyse how attitudes and Environmental Citizenship are related to each other. The chapter focuses mainly on the individual level of describing the factors that influence Environmental Citizenship. Special attention is given to the process how attitudes toward Environmental Citizenship can develop.

The notion of Environmental Citizenship embodies behaviour – an actively involved citizen who is practising his/her environmental rights and obligations in the private and public spheres. In Part III, Chap. 8 Daphne Goldman and her co-authors examine the relationship between Environmental Citizenship and responsible environmental behaviour. They consider that the social and psychological study of behaviour has much to inform the study of environmental behaviour and how to reach the goal of sustainable socioecological transformation. The chapter presents selected models on the factors that influence behavioural decisions as well as various theories that inform these models. The chapter concludes with some suggestions for Education for Environmental Citizenship deriving from the various models.

Youth democratic activism develops young people's critical scientific literacy, which is an important element of Environmental Citizenship. In Chap. 9, Pedro Reis discusses the concept of activism and the importance of activism initiatives in the development of citizens' willingness and competences for critical, active and democratic engagement in preventing and solving environmental problems. Several possible pathways for young people to get involved in activism are presented, and a combination of youth activism with citizen science is also discussed.

Environmental Citizenship is examined within the frames of the EfS. The similarities and differences between Education for Environmental Citizenship and EfS are discussed by Gemma Parra and her co-authors in Chap. 10. Specific educational approaches and methodologies are suggested that may be effective in promoting essential qualities in Environmental Citizens. The proposal of specific Education for

Environmental Citizenship competences and how education and teachers can promote these competences are also important points in this chapter.

Part IV starts with Chap. 11 where Environmental Citizenship is examined in primary formal education. Jan Činčera and his co-authors start from the point that primary formal education can provide opportunities to achieve Environmental Citizenship goals. They present how the specifics of age and formal settings could be approached and which educational strategies could be used, recommended or avoided based on the existing research. This chapter also provides an overview of the most important educational aims regarding the development of Environmental Citizenship in primary formal education, namely, environmental sensitivity, a sense of justice, a basic understanding of ecological systems, skills for basic investigation of ecological and social phenomena and action skills relating to active participation in community issues.

The aim of Chap. 12 is to explore how non-formal education can take place for young children (primary education) as a space to experiment with and to learn the competences needed as Environmental Citizens. Boeve-de Pauw explores the potential of non-formal education to facilitate the development of children's environmental identity and their identity as agents of change. An overview of significant life experiences that can contribute to this development is presented. The chapter identifies key aspects in implementing the concept of Environmental Citizenship, which should focus on the experiences encountered by children in their 'reality' and should be based on participatory principle and negotiated in a very flexible framework.

In Chap. 13, Niklas Gericke and his colleagues focus on the demands and challenges that need to be overcome and are related to context differences as well as to formal education requirements in order to enact Environmental Citizenship teaching approaches in secondary education. In secondary education, students are taught by several subject specialists from different disciplines. To enact Education for Environmental Citizenship, these different teachers need to collaborate. Moreover, secondary schooling might have different aims compared to other school forms, and it is often regulated with specific subject syllabi. How Education for Environmental Citizenship can be enacted considering these challenges is also discussed in this chapter.

Education for Environmental Citizenship in non-formal frameworks for secondary level youth is another important dimension covered by this book. In Chap. 14, Paraskeva-Hadjichambi and her co-authors deduce that non-formal settings for secondary education level could contribute to Education for Environmental Citizenship by providing the opportunities and conditions that enable young people to be empowered and motivated to act and participate in society as agents of change in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability and restoring human relationships with nature. They present how different pedagogies including place-based education, civic ecology education, ecojustice pedagogy, action competence and socio-scientific inquiry-based learning can all contribute to achieve environmental and social change. They conclude the chapter by emphasising the need for a complete pedagogical framework fostering Education for Environmental Citizenship.

In the final chapter of the book, Chap. 15, Hadjichambis and Paraskeva-Hadjichambi summarise a specific model (EEC model) of the Education for Environmental Citizenship that needs to be fostered, recording the outputs, dimensions, scales and the spheres of Environmental Citizenship. In addition, a specific pedagogical approach is proposed that can effectively promote EEC model. The chapter draws the pedagogical landscape of Education for Environmental Citizenship and describes the stages and the steps of this innovative, integrated and holistic pedagogical approach. This chapter discusses the need for curriculum and learning materials fostering Education for Environmental Citizenship and argues for the vital role of schools and educational institutions and the crucial role of teachers and teachers' professional development for the adequate establishment of Education for Environmental Citizenship.

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Part I
Political, Economic and Societal Dimensions of Environmental Citizenship

Chapter 2
Political Dimensions of Environmental Citizenship

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2.1 Introduction

Conceptions of Environmental Citizenship are core to models of sustainability. We start with an example of two very different ideologies to set the parameters of the problem. Imagine a fully libertarian society with minimal state interference where the desires and consumerist preferences of the individual trump all other considerations (Kymlicka 1990). Such a society would prioritise human rights, the free market and individualism. Nature would be a resource to be exploited to serve human needs. Hence a society with a fully libertarian political philosophy, or one which approaches extreme neoliberalism, would incorporate political and economic solutions which conserve the environment solely to meet human needs. Any threats to the environment as an economic resource might be solved through technical fixes. Rex Tillerson, the former US Secretary of State, exemplifies this approach. 'Changes to weather patterns that move crop production areas around – we'll adapt to that. It's

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an engineering problem, and it has engineering solutions' (*Washington Post* 14 December 2016).

An example at the other end of the ideological spectrum would be a communalistic and egalitarian society where the common good supersedes individual desires. Resources come to be shared on an equitable basis, and Nature and humanity coexist in accord such that the human species have no privileged role. Human rights in such a society will be a very different construct compared with a libertarian one. In the latter, policing, if indeed it exists, will be aimed at maximising individual liberty; in a communalistic society, the role of policing is to maintain egalitarianism possibly at the expense of individual liberty. Responsibilities towards the common good in a communalistic society are prioritised over individual rights.

It should be mentioned that close to the ideology of communalism and egalitarianism is communitarianism. Contrary to liberalism, communitarianism (relating to social organisation in small communities) maintains that the attitude of uncontrolled free-market economy and consumerism towards the environment should be reconsidered. Treating the environment as an inexhaustible source of profit without thinking about the (near) future seriously endangers the planet and threatens to drive society into economic and demographic catastrophe. According to the proponents of communitarianism, for example, Etzioni (2015), measures introduced by state institutions should be combined with community efforts (i.e. efforts at the level of individuals, families and local communities). Only in this way can a reasonable and morally responsible balance be achieved between the free-market economy, the present-day exploitation of natural resources and the prospects of preserving the ecological equilibrium, giving future generations a chance to live.

These are of course extreme, and probably mythical, examples, and there are natural constraints which make their extremity impossible. For example, an extreme libertarian society would need to preserve some common resources and take into account the common good for individuals to prosper[1]. An extreme egalitarian society which refused to prioritise its own species would find it difficult to survive if no action was taken against parasites.

These two examples represent very different philosophical perspectives about the relationship between human beings and the Natural world. The libertarian example can be termed an example of anthropocentrism where Nature has no intrinsic value but exists to serve human needs. Anthropocentrism is often understood to reflect instrumentality, i.e. Nature as subservient to human needs. But a 'weak' form of anthropocentrism distinguishes between human instrumentality and human-centredness. In the latter, there is scope for respect for other species in relation to human survival, so a sense of centredness is perhaps unavoidable (Dobson 2007).

[1] It is worth noting that such a system comes close to the political views of Margaret Thatcher. This quote is from an interview she gave to *Woman's Own* magazine on September 23rd 1987 '… who is society? There is no such thing! There are individual men and women and there are families and no government can do anything except through people and people look to themselves first. It is our duty to look after ourselves and then also to help look after our neighbour and life is a reciprocal business and people have got the entitlements too much in mind without the obligations…'

Ecocentrism views Nature as having intrinsic value, life itself is the centre of ethical concern (Kopnina 2013) and living and non-living beings are seen as part of an interdependent holistic ecosystem.

While we have exemplified cases from polar ends of political environmental ideologies, there is, in reality, a spectrum of ideologies (Corbett 2006) which reflect various hues of anthropocentrism/ecocentrism (see Fig. 1). For a given type of society, however, to prosper politically in environmental terms presupposes certain constructs. These are:

- An underpinning philosophical view of the environment
- A particular perspective of citizenship
- Key players

Our position is that these aspects are incorporated in an understanding of the political dimensions of Environmental Citizenship.

2.2 Philosophical Views of the Environment

Post-enlightenment practice has been infused with a view of the epistemological predominance of scientific rationalism and the distinction between the sentient Mind and Nature. In terms of environmental philosophy, the distinction between Mind and Nature has been prevalent both in right-wing libertarianism and in Marxism. Nor are ecocentric views necessarily configured within one particular ideology, for example, the way in which eco-fascists co-opt deep ecology ideas (http://environment-ecology.com/deep-ecology/278-ecofascism-deep-ecology-and-right-wing-co-optation.html).

Dobson (2007) distinguishes between two political ideologies connected with the environment both of which have important philosophical roots. *Environmentalism* constitutes ameliorative changes which can be incorporated within present values of predominantly capitalist production and consumption. It therefore comes within the compass of broadly anthropocentric perspectives. *Ecologism*, on the other hand, presupposes that a sustainable future means 'radical changes in our relationship with the non-human natural world, and in our mode of social and political life', (p. 3) i.e. one which problematises any ontological distinction between Mind and Nature.

Dobson justifies his distinction in ways which reflect the importance of philosophy to ideology and hence to political action. Consider, for example, Tillerson's solution to climate change quoted above. In terms of ecologism, this problem of climate change lies in a distortion of the fundamental interrelations between human and biotic and non-biotic communities. It is not a matter of adjusting certain technological or social relationships but is situated in a fundamental truth: that the disjunction of human beings from the stewardship and workings of Nature is the cause of the problem. Dobson, in fact, claims that environmentalism is not an ideology while ecologism is because the latter is based on a fundamental truth about the

human condition. It is, however, possible to claim that environmentalism is based on an implicit truth: the separation of Mind from Nature.

2.3 Citizenship

If ecologism entails people living sustainably, certain commitments of citizenship follow including finding a balance between maintaining individual rights and a responsibility towards the common good.

Within a democratic society, Johnson and Morris (2010) distinguish between three types of 'citizen' (Table 2.1).

1. The citizen who is *personally responsible* and obedient to laws and acts responsibly but does not actively question the norms of society
2. The citizen who is *participative* but tends to act as an individual
3. The *socially responsible citizen* motivated by a concern for social justice and who can identify obstacles which need to be overcome to attain a fairer society and cooperates with others in enacting change

It is the socially responsible citizen that coheres with an ecologist perspective. In characterising this form of citizenship, we use the term 'green citizenship'.

Socially responsible citizens have an active and committed engagement to pursuing a certain way of life consistent with a more sustainable society: their duty is to live sustainably so that others may live well; they consider themselves under an obligation to act justly. In doing so, their responsibilities are global and extend beyond species and international boundaries.

A green republican perspective (Barry 2008) combines a judicious balance between rights and responsibilities, maintaining a variety of views on the public good, but also cherishes individual freedoms and common practices. It encompasses a commitment to individual agency: the choice of rationally justifiable action based on personal and social circumstances, with a critical understanding of the structural

Table 2.1 Types of citizen

Type of citizen	Personally responsible (liberal/passive)	Participative	Socially responsible (republican/active) (green citizen)
Characteristic	Behaves responsibly without questioning why	Behaves responsibly and takes action	Critically reflects on social justice and takes action accordingly
Example	Recycles waste	Distributes leaflets on recycling	Discusses with others in local forums whether recycling scheme saves energy and negotiates as to how best improve recycling scheme for benefit of community

dimensions which underpin the effectiveness of sustainable action – political, economic and social dimensions.

In contrast with deep ecology (Naess 1988) or radical ecocentrism, it does not, for example, oppose consumption per se (to maintain public services such as health and education, some form of consumption is necessary) but promotes 'mindful' consumption, i.e. that which is consistent with the aims and philosophy of a sustainable society. Green republicanism is consistent with ecologism because it recognises the need to *transform* those features of capitalist society that promote hyper-consumerism and the injustice of a society in which goods are so unevenly distributed[2].

Most people live within states and have contractual responsibilities towards each other codified through legal systems. Should states support voluntarism in which those citizens who choose to live sustainably take required action while others might choose unsustainable paths? Or should there be elements of coercion provided by the authority and laws of the state so that all citizens take a part in moving towards an eco-just society? Barry (2005) and Humphreys (2009) argue that green republicanism does require obligations from a state's citizens, for example, physical labour, in helping to improve drainage systems, breeding grounds for birds, seeding wildflowers in waste grounds as well as engaging in democratic deliberation such as critical discussion of forestry developments, the role of the private sector and NGOs in environmental projects and the role of the state in international obligations such as controlling carbon emissions.

Such an approach entails fine distinctions between freedom and coercion and degrees of popular resistance to changes which are seen as leading to environmental depredation and unsustainable economic systems. So green republicanism does not mean compliance to meet what might be justifiable demands of the state, i.e. in the case of personally responsible citizens, but engaging in robust democratic deliberation, possibly backed by non-violent protest, to achieve eco-just ends.

There are interwoven issues to consider. While many scientific and technological developments are directed towards the public good in terms of their social desirability, ethical acceptability and sustainability (Owen et al. 2009), products and developments carry with them certain risks and hazards. Nanomaterials, for example, have many potential social benefits, but such small particles present unquantifiable health risks (Patenaude et al. 2015). Ravetz (2004) depicted post-normal science, as identified technologies such as nanotechnology, robotics and artificial intelligence, known by the acronym GRAIN, as those where decision stakes and social uncertainties are high, presenting potential unknown hazards.

In addition, many of the environmental challenges that beset contemporary societies often involve sophisticated levels of scientific understanding, for example, estimating the sources and levels of pollution of watercourses, the causes and extent of losses of biodiversity, the cost-benefits and quality control of organic products.

[2] Wilkinson and Pickett's book, *The Spirit Level* (2010), demonstrates that more egalitarian countries have lower infant mortality rates and more sustainable societies after gross GDP is taken into account.

Just solutions to these problems echo the democratic nature of green republicanism in ensuring that lay people and experts have open and dialogic channels of communication (Layton et al. 1993; Jasanoff 2003). Stakeholders affected by technological developments can often bring anecdotal and local knowledge which needs to be incorporated in the contexts of expert scientific knowledge, as well as open means of deliberating risk and uncertainty (Beck 1995). At the same time, forums of discussion and persuasion need to be set up for deliberations to take place between experts, lay people and policy-makers, particularly in relation to GRAIN technologies.

Democratic deliberation involves participation and negotiated decision-making in the form of open, respectful and critical discussion underpinned by reason (Bridges 1979). Such forums have operated in many different types of contexts such as citizen juries (Gastil 2000), consensus conferences (Joss and Durant 1995) and youth parliaments (Percy-Smith and Thomas 2010). Procedures involving democratic deliberation consist of drawing on relevant knowledge, normative clarifications and the ability to make decisions in relation to the context of the activity. Operationalising these procedures consists of the following practices:

1. Ensuring regular exchange of views between experts, policy-makers and lay people
2. Obtaining public feedback to identify alternative possibilities
3. Direct work with stakeholders throughout the process of deliberation to respond to public concerns in a coherent manner
4. Collaborating with stakeholders and lay citizenry in the development of preferred solutions
5. Empowering participants to acquire relevant knowledge in implementing decisions
6. Ensuring direct decision-making is in the hands of the public (Engage 2020, www.engage2020.eu)

Criticism of democratic deliberation is that such procedures are underpinned by equal access to those democratic structures that presuppose deliberation as well as the power and know-how to activate decisions. However, this ideal does not always pertain. It can be prejudiced in the interests of those who propose the forums; it means framing the debate in a way that satisfies contending parties – not easily attained – and there is no obligation to act on decisions made (Levinson 2010). Jackson et al. (2005), however, have shown that where values, risks and benefits are discussed between experts and stakeholders at early stages of development of an innovative technology, the dialogue by all parties is deemed to be constructive.

Some other political approaches of Environmental Citizenship such as pluralism (feminist, multiculturalist) and globalism (cosmopolitan and neoliberal) are also worth mentioning. Pluralist theories (feminist and multicultural) challenge the universalism and the exclusion of difference in association with the classical political theories of citizenship (Cao 2015). Historically, certain groups of people have been excluded from full citizenship (e.g. women, sexual minorities) but also indigenous people and ethnic minorities, especially for the populations of Global South. Feminist theories challenge the public/private divide (Yuval-Davis 1997), expose the gender character of citizenship and reveal the centrality of time for the exercise of citizenship in relation to additional rights (Lister 1997) based on sexual differences (e.g. reproductive rights, right to abortion, maternity leave). Feminist

Environmental Citizenship incorporates the move 'from care to citizenship' (MacGregor 2004), the importance of justice (especially gender justice) and social sustainability.

Multiculturalist theories advocate the recognition and granting of rights to cultural minorities, pointing out that the neutrality of the state enables the dominance of the majority, hence emphasising the need for Multicultural Citizenship (Kymlicka 1995). Multicultural Environmental Citizenship includes sensitivity to conceptions of Human-Nature relations amongst indigenous people and the incorporation of indigenous cultures, values and people (Latta and Wittman 2012).

Globalist theories include cosmopolitanism and neoliberalism. Cosmopolitans argue for global citizenship, the need for the protection of human rights and to prioritise global responsibilities (Beck 2006). Cosmopolitan citizenship poses the idea that we should all consider ourselves and operate as equal members of the political community of the cosmopolis or planet Earth. Cosmopolitan Environmental Citizenship creates a greater sense of interconnection and interdependence on a global scale beyond state boundaries (Beck 2010). Finally, neoliberalism considers citizens as consumers and advocates for the importance of corporations as agents of citizenship. It transforms citizens to *Homo economicus*. Neoliberal Environmental Citizenship is expressed by sustainable consumption, green consumerism and consumer-sensitive lifestyles.

2.4 Role of the State

Operationalising a green political philosophy, in this case green republicanism, entails some process of contractual obligations which enables the promotion of a sustainable society. At present, it is the state and its judicial systems which have the authority to underpin such obligations. But the role of the state in relation to green republicanism is always likely to reflect a tension between non-violent civil resistance against the state and its interests, for example, in differences over fossil fuel divestments and ensuring order and stability so such contracts can be fulfilled.

Another current problem is one discussed on BBC Radio 4 on 23 May 2018. Southern regions of the UK are likely to experience water shortages by 2050. To avoid this situation, there are a number of possibilities:

1. Trust that people carry out obligations originating either from the state or through local consensus.
2. Encourage local collaborative thinking to promote actions to conserve water supplies.
3. Enforce stricter usage of water through punitive actions.

The first two are voluntary. The third is to ensure compliance. How far can a state committed to green republican policies steer a judicious line between voluntarism and enforcement?

In effect, the rollback of the state has meant that policies on environmental management have been carried out by the business sector or non-governmental organisations (NGOs). Chasek et al. (2018) have identified the main actors in environmental policy as states, international organisations such as United Nations-affiliated bodies and NGOs and the business sector (corporations, trade unions, scientific bodies), and policy is often a reflection of power between these sectors.

Humphreys' (2009) depiction of an ecological state would be 'dedicated to governance that respects ecological limits' (p.180). Such a state would reflect intergenerational and transnational needs. This presupposes that its citizens need to recognise the limits of ecological space across space and time; hence, obligations extend beyond borders and generations. Such obligations would mean recognising disparities in ecological footprints and commitments to reduce these disparities so that resources were more evenly distributed and extended over a longer period of time. The rights and duties of states and their citizens extend beyond national borders.

Young (1984) identifies four clusters of problems to which state and citizen obligations would apply:

1. *Commons* that belong to all, e.g. climate systems, the Antarctic wilderness.
2. *Shared natural resources* which extend across national boundaries, e.g. rivers.
3. *Transboundary externalities* which exist within particular states but have international effects such as acid rain.
4. *Linked issues* where efforts to deal with environmental concerns affect others, e.g. cutting down on air travel affects livelihood of others.

While these problems are referenced in relation to state and citizen action, some of the problems are generated by transnational corporations which can evade national jurisdictions, for example, the Transatlantic Trade and Investment Partnership (TTIP) agreement.

2.5 Implications for Education

So what are the implications for education in schools?

Many resources and policy papers have been written on the role of environmental education in schools. Here, however, we outline some broad principles for Environmental Citizenship and some underpinning strategies.

First, there is the need for young people to understand foundational philosophical and cultural principles that influence our judgments but which are rarely made explicit. This is a recognition of the relationship between humans and Nature. Such a relationship grows from emotional, cognitive and psychological influences including supporting young people's respect for other living species, for example, gardening, providing a bird bath and supporting reflection on the need to protect other species but respecting Nature's 'wildness'. A critical education could raise questions on whether other species have rights, how such rights are recognised and the ethics of human interference in Natural processes. Central to these deliberations is pedagogy, particularly teachers' knowledge and understanding of the topics and the

need to respect and listen to young people's ideas, what Levinson (2018) has termed knowledgeability and non-presumptiveness, in other words the practice of democracy within the classroom.

Within a sustainable society, young people also need to understand that they could and should have a political role beyond the legal frameworks of representative democracies; as young people, they are also citizens rather than 'future citizens'. They need to understand those political structures which can be transformed through actions open to them for living in a sustainable environment, moreover to experience what it means to struggle politically for desirable change. Figure 2.1 illustrates a spectrum of philosophical and citizenship relationships which need to be taken into account and operationalised in a school context.

2.6 Empirical Research

In this section, we briefly overview potential empirical research related to developing critical and transformative dispositions towards sustainability. This incorporates such constructs as:

- Expressing reflective perspectives about human beings in relation to the biotic and non-biotic spheres
- Critical and informed views of Nature as a system
- Understanding and expressing the perspectives of others towards natural resources across space and time – contemporaneity
- Knowledge of political, social and economic structures which explain possibilities of sustainability
- Understanding of values which inform a sustainable approach
- Appreciating what can be achieved through political action
- Willingness to specify realisable aims, to implement strategies and, if necessary, non-violent action

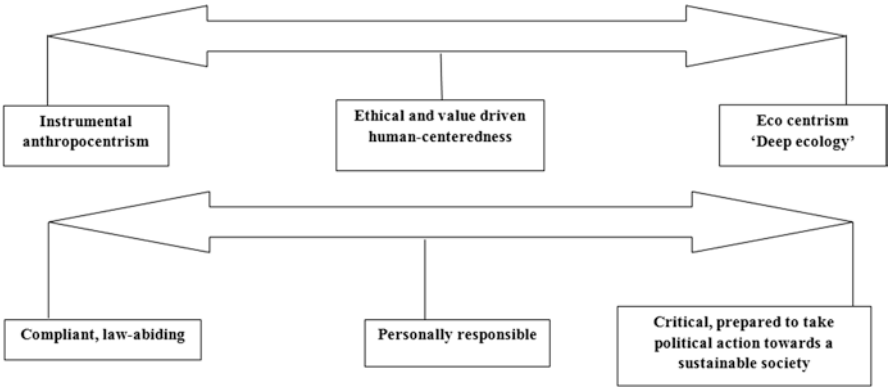

Fig. 2.1 The spectrum of philosophical and citizenship relationships

Such a programme can best be achieved by mapping change as students, with the support of teachers, identify questions which help them enact change. But it is perhaps overambitious to expect such approaches to be introduced quickly. Johnson and Morris's (2010) map of critical Citizenship Education can be a starting point for mapping the necessary dimensions (Table 2.2).

Table 2.2 could be a starting point for identifying the constructs of an education for green republicanism.

Table 2.2 Dimensions of green republican citizenship

	Politics (ideology)	Social (collective)	Self (subjectivity)	Praxis (engagement)
Knowledge	Knowledge and understanding of political systems and power structures (understands where authority lies, e.g. knows who to lobby to promote open spaces for local species)	Knowledge of interconnections between culture and power for transformative action (can identify diverse political and cultural discourses, e.g. *knowing how* to negotiate with authority)	Sense of identity (understand how they are positioned in relation to a particular issue; can identify connections as an individual to broader social and global issues, e.g. effect of own and social actions on global climate change)	Knowledge of how to affect change for eco-justice (knows how to garner support to effect change, e.g. through local action groups)
Skills	Critical political analysis (understands importance of status of knowledge)	Capacity to engage in dialogue and deliberation (takes part constructively in classroom discussions but also understands limits of deliberation)	Reflect on own status in society (can put themselves in others' shoes)	Imagines and articulates position of a more socially and eco-just world
Values	Commitment to values underpinning sustainable living	Ability to reflect others' values and positions	Consideration of self-worth (able to express their particular perspective)	Informed, responsible, reflective ethical action
Dispositions	Actively questioning environmental injustice (e.g. slave labour production of coltan for digital technologies resulting in displacing people to rainforests) (Lalji 2007).	Responsible towards self and others (awareness of own ecological footprints in relation to others)	Autonomous and self-critical (can listen to others' perspectives respectfully while maintaining different political commitments)	Commitment and motivation to transform society responsibly (communicates reasons for actions to others)

Adapted from Johnson and Morris (2010)

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Chapter 3
Economic Dimensions of Environmental Citizenship

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3.1 Introduction

The concept of Environmental Citizenship requires a critical discussion on economic development. Generally, economics 'enjoys' a negative attitude among citizens around the globe in relation to its impact on the state of the environment. Simply put, business is in a role of 'bad guy' responsible for the degradation of (not only human) environment. The term 'economics' is derived from the Greek word oikonomia composed of the words oikos (house, household) and 'nomos' (rule, law). First mentioned in ancient Greece, Aristotle termed economics as a science of 'household management'. Over the centuries (and especially after the Industrial Revolution), economic relations rose to the extent which cross national borders causing interdependence and influence the quality of life of citizens across the

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globe. In fact, mankind's dramatic role and economically driven activity influence its own environment and the state of nature in the both negative and positive ways.

The study of economics begins with the clarification of basic relations between the supply and demand on both a micro and a macro level. Education on micro- and macroeconomic principles is usually based on mainstream economic thinking. It is naturally founded on the growth (national and transnational level) and on the profit (individual and corporate level). Thus, the tools, mechanisms and concepts used are adjusted to achieve these goals. Solutions to the disparities between a desirable state of the environment and its real state as a result of human economic activity are therefore based on a change of approach as to how or whether to achieve economic growth.

3.2 Conceptual Approaches

Economy, as a science, deals with the utilisation of limited resources for the production of useful assets and services and their subsequent distribution to different groups in society. Economics study how and why people (as consumers, corporates, NGOs, public sectors or government agencies) make decisions about the use of valuable resources. The area of knowledge specialised in the study of environmental problems with the perspective and analytical ideas of economics is called environmental economics. The study of nature in its role as a provider of raw materials is called natural resource economics (Field 1994). The field of economics, which is contrary to the mainstream economics (and environmental economics as a part of the mainstream economy), is ecological economics focused primarily on economic-environmental relations. Ecological economics studies the relations of the human being with its organic and inorganic environment (Common and Stagl 2005). Ecological economists consider their field more interdisciplinary and argue that environmental economics adopted neoclassical economic paradigm to the extent to which it caused researchers to be blinded to other disciplinary views (Beder 2011). Daly and Farley (2004) defined the objective of ecological economics as the searching of ways towards 'steady-state economics' and simultaneously towards a fair distribution of resources not only for recent but also for future generations. Steady-state economics is the economy that does not grow or fall and remains at a level that allows the restoration of natural ecosystems and the long-term dignity of mankind. It could refer to a national economy, but also to a local, regional or global economy.

Beder (2011) introduces ecological economics as a more interdisciplinary approach, incorporating the research of economists, ecologists, philosophers and social scientists. The influence of ecological economics seems to be limited to areas where it retains the standard economic view of environmental problems (e.g. ecosystem services). Interdisciplinarity has been unable to overcome political and social barriers. Beder claims that whilst many academics seek interdisciplinarity in their research, the same cannot be said of government ministries, departments and agencies, which are generally divided into specialised domains dealing with stakeholders from particular sectors of the economy.

3.2.1 The Ethics and Values

Economists use preferences as the normative criteria in studies dealing with an individual's choice between alternatives. In that way, a decision is determined by individual preferences. In analysing policy choices, we assess the normative criteria from some ethical position. The ethical basis for economics is *utilitarianism*, which is the principle of assessing the values (moral correctness of an action) where utility refers to the balance of pleasure and pain of an individual. Pleasure increases the utility of an individual and, vice versa, pain reduces it. The entire utility of individuals is known as welfare. Normative economics does take account only of the utilities of human beings.

Common and Stagl (2005) stated that there is no difference at all between ecological economics and neoclassical economics – both are anthropocentric, as well as utilitarian. For many environmentalists, especially deep ecologists, this is unacceptable and arrogant because it denies other living things any intrinsic value, namely, any value outside of their value to humans (Beder 2011). Beside of purely ecocentric or biocentric aimed academics dealing with consequences of human economic activity, there are world authorities that strongly emphasise not only environmental (crisis of climate change) but also social (poverty) issues caused by modern culture's anthropocentrism (Francis and Bartholomew 2017). Explained simply by Pope Benedict (2009) – when 'human ecology' is respected within society – environmental ecology also benefits.

There are some differences between ecological economics and neoclassical economics in the way that human pleasure/pain is to be measured. Neoclassical economics considers each human individual to be the sole judge where the change of its utility is measured only in terms of the preferences. These preferences are taken as a given, bearing in mind consumer sovereignty is not subject to any moral evaluation. Ecological economics does not treat individual preferences as sovereign or as the only source of normative criteria (Common and Stagl 2005).

Carroll (2016) claims that the environment and environmental issues are *both* moral and spiritual issues. He argues that defining environmental questions in this way is not new but dates back at least to the philosophical writings of Aldo Leopold in the United States and his famous 'land ethic' essay, published in 1948. Leopold (1949) worked out a new approach towards the value of nature which could be called (for now) neo-anthropocentrism, where nature not only has value for man but also for its own value (Androvičová and Rácz 2017).

Mainstream economists take a very specific view of the term 'value', which relates to the exchange value of a commodity rather than any broader concept that might include aesthetic, spiritual and ethical dimensions. When environmental economists speak of valuing the environment, they mean giving it a market price based on supply and demand and individual preferences (Beder 2011). Neoclassical economists do not concern themselves with moral, political and ethical concerns because they assume that the market is an ethical system and that political decisions should be made separately. They dismiss the idea that aggregating costs and benefits

cloud distributional and equity issues of who gets the benefits and who suffers the losses, by arguing that in theory those benefiting could compensate the losers ensuring that no one is worse off (Pareto criterion) (Pearce 2002).

According to neoclassical economics, the environment can be priced because the option and existence of values can be translated into the preferences of individuals and those preferences in turn can be measured. However, individual preferences are shaped to a large extent by the information available to people about the consequences of their choices (Beder 2011). Economic logic is that individuals act to optimise their own interests, and Daly and Cobb (1989) marked 'the intelligent pursuit of private gain' as the essence of rationality. If this is the principle behind the market system, then altruistic behaviour is rational. The assumption that there is no common good outside of individual wants and preferences leads to the idea that markets satisfy needs of people more efficiently than governments. It is contrary to interdisciplinary knowledge about people's motivations and political behaviour. When people act politically and vote, they often see themselves as part of a group. They are not only concerned about their self-interest, but they also consider the 'good of society' (Self 1990, p. 9). Cao's definition of Environmental Citizenship includes not only membership in a group (humanity and earthlings) but also rights (clean air and water), responsibilities (not to pollute) and means of learning (education and awareness campaigns) (Cao 2018, p. 14). Individuals could effectively reveal their Environmental Citizenship in local communities' actions. The encyclical *Laudato si'* introduces an example where local cooperatives are being developed to exploit renewable sources of energy, which ensure local self-sufficiency and even the sale of surplus energy. The encyclical explains that if the existing world order proves powerless to assume its responsibilities, local individuals and groups can make a real difference. Corruption causes inadequate law enforcement, and therefore public pressure has to be exerted in order to bring about decisive political action. Unless citizens control political power – national, regional and municipal – it will be impossible to control damage to the environment (Francis 2015, p. 131). People as consumers seek to maximise their own materialistic wants, whilst as citizens they are concerned with what constitutes a 'good society" (Cooper and Hart 1992, p. 22).

Dealing with the state of environment in relation to human economic activity, the environmental economist Field (1994) evolved the answers on the request – Why do people behave in an environmentally inappropriate way? Is it a question of unethical or immoral human behaviour that causes environmental degradation? If people lack the moral and ethical strength to refrain such type of behaviour, we need to increase the general level of environmental morality in the society – the role of education. Furthermore, if the approach is strictly based on the moral argument, it means that people pollute because they are morally underdeveloped in some way. Field states that this is the way the economic system is arranged, and it is the precondition for human behaviour. Another approach is the setting of economic system and its institutions and the decision-making processes that result in environmental degradation. If people pollute because it is the most economical (cheapest) way to manage their households or businesses, it is also an issue of certain institutional setting (whether

economic or social institutions). In that way, institutions need to be set up to structure the incentives that lead people to make decisions in a more desirable direction.

Interestingly, Field (1994) argues that it is a simplistic incentive-type statement that pollution is a result of the profit motive, which is seen in market-driven economies of industrialized western nations. He gives an example of environmental degradation and heavily polluted air and water resources in the former USSR and other former communist regime countries. Here, economics had been centralised and the profit motive entirely lacking. He argues that the profit motive is not the main cause of environmental destruction.

3.2.2 Environment and Mainstream Economics

In his book *Environmental and Resource Economics* (1988), Michael Common describes how mainstream economics perceive three functions that the natural environment serves in relation to economic activity: S stands for sink (waste products), R for resources and A for amenity (recently recognised as ecosystem services). He outlines that production and consumption generate waste products (residuals), for which the natural environment is the ultimate dumping place or sink. It is also the source of inputs to production – natural resources (mineral deposits, forests, animal populations). Amenity relates to services flowing from the environment (living space, natural beauty, recreational space, etc.). These three economic functions of the natural environment are not necessarily mutually exclusive but may be, at a certain level, of use to the economic system. High levels of pollution will reduce the production of inputs (supply of natural resources) and/or the flow of amenity services even to zero. Going deeper, indefinitely prolonged economic growth may be impossible due to the finite nature of resource stock. Common pointed out that pollution and resource extraction are reducing the natural environment's contribution to the quality of life. Also, the process of economic growth gives rise to — and is affected by — environmental problems. Mainstream economists (since the period of the 1970s when an attack on the growth objective appeared by a number of non-economists) took position that a growing economic system need not run out of natural resources and that economic growth need not reduce the quality of life. The argument was that a properly functioning price system will accommodate higher levels of production and consumption to preserve the natural environment in a satisfactory state. This price mechanism operates on scarcity – if anything, i.e. natural resources, become scarce, then less of it is used. This argument could be applied to the environmental functions. In the case where economic growth has impaired these functions, waste disposal would become a costlier activity; hence, the price of amenity services would increase. In this way, an economic system reduces the demand for the mentioned environmental functions. An obvious solution to the increasing number of residuals was/is recycling, in which case, residuals return to production as inputs instead of disposal into environment, with the amount of resources used

being reduced as well. Also, to the extent that virgin resources become more expensive, recycling will be encouraged by the price mechanism.

Such an oversimplification is taken on by mainstream economists. This kind of argument needs one condition to be fulfilled: the price mechanism must work properly. If private property rights exist in those things where the mechanism has control, then only things that people own can be exchanged under the described price mechanism. Mainstream economists state that environmental problems are not the consequence of economic growth. They argue that such problems are the consequence of inappropriate patterns of economic activity. This would not arise if relationships between the economy and environment were determined by a properly functioning price mechanism. So, the problem is not in the economic growth but in achieving the pattern of economic growth that assigns a properly functioning price mechanism (Common 1988). The consequences of such thinking are not fair to people at different points in time; growth, however, remains the 'mantra' for mainstream economics.

The Limits to Growth (Meadows et al. 1972) belongs among the influential pioneers' publications that contradict the mainstream economics view. The study forecasts the collapse of the system resulting from exponential growth until it hits its environmental limits. The authors recommend leaving economic growth as a policy objective. The study was met with strong criticism from economists arguing that the computer model of the world economic system operated with a static price mechanism. It meant that the mechanism could not accommodate growth to environmental constrains. Nevertheless, the publication contributed to widespread interest about environmental problems in the early 1970s.

The study of Environmental Citizenship has a lot to do with the term sustainability, since it is understood to maintain the capacity of the joint economy-environment system to continue to satisfy the needs and desires of humans for a long time into the future (Common and Stagl 2005). Considering the word 'maintaining' (as defined in the above-mentioned study), one could suppose that the capacity is enough. However, in case of a shortage, scholars could argue that the capacity needs to be increased rather than maintained.

A purely environmental point of view would be difficult to maintain since social issues are at least as (if not more so) crucial as that environmental. Except for a relatively sufficient level of prosperity in some nations, mass poverty can be found around the globe. Again, mainstream economic thinking sees economic growth as the proper tool to fight poverty.

Here, another influential publication should be mentioned – *Our Common Future* (also known as the 'Brundtland Report') reported by the World Commissions on Environment and Development (WCED) in 1987. The report described the extent of poverty as well as the various threats to sustainability. According to Panayiota (2012), the report recognised that the environmental limits to economic growth in industrialised and industrialising societies existed and claimed that poverty reduces sustainability and accelerates environmental pressures – creating a need for balance between economy and ecology. It argued that sustainable development is needed as a new kind of economic growth with much less environmental impact which

increased the joint economic-environmental system's capacity to deliver human satisfactions (Common and Stagl 2005).

3.2.3 *Market Externalities, Tragedy of the Commons and Neoliberal Environmentalism*

Externality is the economic activity of an economic entity that has positive or negative effects on other entities without the emergence of market relations between them. This means that costs and revenues are passed on to others free of charge (Šálka et al. 2008). There is a standing scientific/economic dispute over internalising external cost and benefits. Simply put, prices should be adjusted with a tax or charge so that the buyer of said goods or services causing the external cost is obliged to pay for it (Beder 1996; Nadeau 2008).

Arthur Pigou, student of Alfred Marshall, dealt with externalities and published *The Economics of Welfare* in 1920. The book outlined his vision of economics as a toolkit for improving the lives of the poor. Pigou was open to different ways of tackling externalities. He introduced 'bounties and taxes' as the forms of intervention. This type of intervention is known as a Pigouvian tax and became the favourite idea of policymakers especially in the debate over global warming. The criticism of this approach is that the impact of a Pigouvian tax depends on the level of competition in the market it is affecting (e.g. case of monopoly).

In *The Problem of Social Cost* (1960), Ronald Coase considered externalities as a problem of ill-defined property rights. He was interested in how property rights are (or should be) allocated and exchanged. The Coase theorem states that 'if trade in an externality is possible and there are no transaction costs, bargaining will lead to an efficient outcome regardless of the initial allocation of property rights'. It is another approach on how to solve the problem of externalities compared to the Pigouvian tax. It means that if it were feasible to assign such rights properly, people could be left to bargain their way to a good solution without the need for a heavy-handed tax.

Beder (2011) states that the rhetoric of internalisation reinforces the premise that the central environmental problem is the failure to 'value' the environment and that markets can adequately deal with this problem when environmental costs are incorporated into market prices through mechanisms such as fees, charges and taxes. Here, the optimal level of pollution is the level at which the costs to the company of cleaning up the pollution equal the cost of environmental damage caused by that pollution. If polluters are paying to eliminate the problem, the community is no worse off because it is being compensated by the firm for the damage through the payments of the tax or charge to the government. So, the payments can be used to correct the environmental damage they cause. Beder clarifies that this is where theory and reality diverge and where economists' lack of interdisciplinary knowledge becomes evident because there is considerable doubt about whether monetary payments can correct environmental damage in many circumstances.

Garrett Hardin is well-known for his concept as introduced in *Tragedy of Commons* (1968). He explains the overconsumption of resources on the specific example of common pasture land and behaviour of herdsmen. One herdsman considers the overgrazing of one animal on the common pasture of little consequence, since the overgrazing will be shared by all the herdsmen, thus minimising any impact. In this way, all the herdsmen will add additional animals to the common rationally considering the negative impact as minor compared to the positive effect he gains. Hardin (1968) states: 'Therein is the tragedy. Each man is locked into a system that compels him to increase his herd without limit – in the world that is limited. Ruin is the destination towards which all men rush, each pursuing his own best interest in a society that believes in the freedom of the commons. Freedom in commons brings ruin to all'.

A change of behaviour is probably the most critical issue to overcome in recent global trends. Stewart Barr (2008) calls for 'critical approach to the links between sustainability, policy and citizen engagement and argues that sustainability policy needs to undergo a major conceptual shift, moving away from a negative approach to behaviour change towards a positive perspective, utilising the well-known techniques of segmentation and social marketing'. Marked as the 'mainstreaming' of sustainable lifestyles, Barr considers it an 'effective means of engaging most citizens in the environmental debate, given the major influence of the consumer society on individual aspiration and belief'. He emphasises 'the importance of bottom-up approaches to resolving environmental dilemmas, while politically, there has been recognition that individual citizens hold the key to meeting critical environmental targets through changes in their life-styles' (Barr 2008).

Cao (2017) deals with the neoliberalisation of Environmental Citizenship and explores the idea that economic rationality reduces Environmental Citizenship to the act of sustainable consumption. This recasts green citizenship as green consumerism. He examines three pedagogical instruments used to promote Environmental Citizenship: government campaigns, ecological footprint calculators and media text. He reveals in what way they 'enable the governing of environment through citizens (as consumers) and making neoliberal green citizens both subject and agents of neoliberal environmentality'.

'Environmental governmentality' has been defined by Darier (1996) as a form of governing the environment which involves 'the use of social-engineering techniques to get attention of the population to focus on specific environmental issues and to instil – in a subtle, coercive manner – the new environmental conduct'. It is argued that the adoption of such techniques comes from the neoliberal mentality with its aversion to government regulation. Cao (2017) further criticises neoliberal citizenship for giving the rights and duties to its new members, corporations. He argues that traditionally, corporations, as economic entities, have enjoyed commercial rights. In the United States at least, they have recently been able to claim and exercise civil and political rights (the right of free speech and the right to participate in political campaigns).

The impact of neoliberalism is perceived here as redefinition of the traditional citizen. Neoliberal theorists shift the focus from the citizen to the consumer and

from the state to the corporation (as agents of citizenship) and from politics to markets (as the sphere of citizenship). These shifts promote consumer and corporate citizenship and transform the citizen from a political being (zoon politikon) into an economic being (*homo economicus*) (Cao 2015). The extent of how market rules are incorporated into social and political relations is leading some authors to argue that we are moving from being societies with market economy to becoming market societies (Sandel 2012). Cao (2017) states that neoliberalism shifts rapidly 'towards the language of individual and corporate responsibility through self-regulation, and a shift towards economics in general (e.g. market rules and values) and consumption in particular (e.g. sustainable consumption) in the dominant articulations of environmental citizenship'. As the author adds, 'Citizenship is being consumed by market values, and active citizenship is often synonymous with shopping'. In the position of the academic who does not know whether to 'cry or shout' in the surroundings where Environmental Citizenship is understood as sustainable consumption, Cao acts as a citizen and votes for the use of the term 'Environmental Citizenship'.

3.3 Levels of the Economic Dimension of Environmental Citizenship

The characteristics and intensity of the economic dimension of Environmental Citizenship change at the global, national and local level. Each level presents a variety of different criteria to consider for analysis ranging from global with the Kyoto Protocol, OECD framework, the Paris Agreement and the UN Environment Programme to more regional agreements on all continents. National governments tend to base their local policies and initiatives to fit within a larger regional and global framework. Local initiatives will also vary depending on a country's social, political and economic situation. Also, economic dimension of Environmental Citizenship could be perceived ambiguously, distinguishing between personal and communal (local, regional, national and global) levels (Berglund and Gericke 2016). Aiming for a comprehensive analysis of economic challenges and opportunities regarding Environmental Citizenship, key stakeholders were identified as examples for existing green economy trends.

3.3.1 Global Level

Understanding the structures, impact and trends of global economic markets is a key element for Environmental Citizenship. Economic globalisation has created a rapidly growing market – independent of national economies and driven by the international movement of goods, services and capital. Trade openness, foreign direct

investment inflows and portfolio investment inflows are the key characteristics of economic globalisation, which impact the social and environmental development at a global level (Li and Reuveny 2003; O'Brien and Leichenko 2000). As global key players, the relevant stakeholders at this level (international corporates, asset managers, insurances and hedge funds) have a high responsibility due to their volume of financial resources.

The global economic growth in 2017 reached 3.1%, the highest rate of global growth recorded since 2011 (World Bank Group 2018). This growth depended mostly on the unlimited exploitation of natural resources, which led to a supply risk and irreversible violation of ecosystems and the environment. The transformation of the global economic growth model depending on the resources exploitation towards a sustainable economy has led to a growing number of citizens and economists exploring different economic models (UN 2015; European Commission 2011). Many international and regional policies were implemented to support citizens and governments to develop green economies, to support for environmentally friendly innovation and to change consumption and production (Altenburg et al. 2017; Green Growth Knowledge Platform 2013; Fay 2012). The global report of the UNEP, for example, stresses the need for an inclusive global finance system, which ensures sustainability and opportunities for natural wealth and the circular and green economy (UNEP 2015).

So-called green investors focus on projects such as the conservation of natural resources, the discovery of alternative energy sources and the trading of reusable commodities. This increasing trend represents a socially responsible investing alternative following ethical criteria (Barnea et al. 2005). The financial performance of green funds in comparison to traditional mutual funds is mostly evaluated as underperforming on a risk-adjusted basis although the performances have improved during the last years (Tett 2018; Chang et al. 2012). One of the strongest trends in global investments is the transition towards sustainable energy. Given the situation that fossil fuels remain competitive, the current stage of the development and establishment of clean-energy technologies needs to be supported and accelerated. Government policies are needed to stimulate the transition towards affordable and sustainable energy supply and align the market forces (Chu and Majumdar 2012).

A green economy is perceived as a tool for achieving sustainability (Šimo-Svrček et al. 2017; Jones 2011) and is defined by UNEP (2018) as low carbon, resource efficient and socially inclusive. In a green economy, growth in employment and income is driven by public and private investment into such economic activities, infrastructure and assets that allow reduced carbon emissions and pollution, enhanced energy and resource efficiency and prevention of the loss of biodiversity and ecosystem services (UNEP 2018). Egorova et al. (2015) have shown that the green economy will influence the health level of nations and increase factors that promote the development of social and economic prospects and the welfare of society in general. However, the main challenge for the green investment is to show a profitable and stable long-term return and a low risk profile, in order to be a good alternative to ordinary investments. Most of these projects have low return and high risk and volatility; however, this can be avoided through tax and other governmental

incentives (Sterner 2017; Filipović and Golušin 2015). Eco investments are still seen as a marketing gag and not as a considerable alternative investment (Bostan et al. 2010). Opportunities therefore lie in eco-projects with a high return and a low uncertainty of failure; those investments either replace another more volatile market such as oil, gas and coal or comply with governmental policy and therefore subsidies (UNEP 2015). Another key element of safeguarding an economic environment for Environmental Citizenship is transparency. Maintaining full transparency is key to guaranteeing the eco-friendly investment approach, creating trustworthiness (Kanagaretnam et al. 2014). Environmental Citizens are interested in companies' social and environmental performances, which makes transparency an irreplaceable key for corporates and governments. Moreover, transparency and public perceptions are increasingly considered as a citizen's right to access to environmental information and participation in environmental decision-making (Marisi 2017). Furthermore, macroeconomists have shown that green economy leads to the monetary welfare and have introduced incitation methods for key players to invest. For example, notable projects against global warming would lead to cheaper insurance. Projects in reusable goods would lead to cheaper waste management, and the replacement of alternative energy would avoid a volatile price development for instable supply (Michel-Kerjan and Morlaye 2008; Paterson 2001; Berz 1999). In conclusion, policymakers need to carefully monitor companies with a high impact on the environment and encourage researchers to find alternative solutions. Many eco-projects serve as great ideas for economic changes but remain unprofitable for many investors.

3.3.2 National Level

Strategic priorities of government programmes incorporated into policies of competent ministries play a fundamental role at the national level. It is a case of countries where governments have the authority to make major policy on the matters of national economy and social security. Here, implementing innovative green policies and implanting the environmental agenda into overall economic planning are up to the decision of national economies or as the consequence of multilateral agreements.

Local governments are instrumental players. No matter how eager and ambitious the central government, the implementation of the various policies largely rests on provincial, city and county officials. Their influence is greater than their interests in realising the green agenda. The public – demanding environmental progress – matters. In particular, the urban population's discontent with air pollution and dirty industries has influenced policymakers (Weng et al. 2015). For example, China's environmental NGOs, a civil society stakeholder group, often assist government players and businesses in realising green economic objectives. Despite gaining influence, the most effective way for environmental NGOs to bring about the desired changes in policy and implementation is through partnering with government departments (Schwartz 2004).

However, other institutions are also influential (banks, insurance and trade companies, research institutions, think tanks, etc.). Financial institution could achieve an even bigger impact by mainstreaming the green agenda in the financial sector and providing the right financial incentives for the society's green development. Businesses (local-level stakeholders) are key operators of green economy policies. Rather than actively driving or demanding change, for the most part, they passively receive government instructions and directions, at least in the initial stage. Once incentives are in place, businesses often drive innovation in technology and implementation – for instance, in renewable energy, eco-city construction, green transportation and the environmental industry. Finally, research institutes provide technical inputs and policy advice to the government, businesses and civil society. Government-affiliated think tanks in particular inform their corresponding ministries (Weng et al. 2015).

According to the European Environment Agency (2011), an emphasis of national green economy assessments varies considerably, ranging from the agriculture to the business sector and from innovation and green jobs to energy efficiency. In general, those countries that have been badly affected by the global recession, for example, Greece, Ireland and Iceland, place a greater emphasis on green jobs and growth as a spur to a green economy. Countries that are highly dependent on primary and extractive sectors such as Ukraine and France tend to emphasise natural resource efficiency, whilst those that have not had the benefit of extensive fossil fuel reserves including Moldova and Austria tend to focus on the energy sector. A wide range of specific targets related to elements of the green economy are set out by countries and progress is reported against indicators (European Environment Agency 2011) (Table 3.1).

There is a strong economic case for improving social and environmental sustainability of trade, and there are clear instances where the opportunities to increase revenues through trade fully coincide with the objectives of a green economy. Developing countries, and particularly the least developed ones, are faced with an urgent need to diversify their economies. Trade-driven pressure on natural resources has escalated and resulted, with few exceptions, in detrimental environmental and social impacts, such as biodiversity loss, environmental degradation and inequitable income distribution. Opportunities to reverse these trends can be found in the growth of existing sustainable trade markets, relative to conventional markets, and in the opening of new markets for green goods and services. Developing countries with abundant natural capital, as well as competitive production costs and valuable human capital, may have an absolute advantage for capturing these opportunities (UNEP 2013).

Table 3.1 Examples of national-level green policies

Country	National-level green policy review
Mexico	The *Low-Carbon Development for Mexico* report by ESMAP (2010) provides an analysis of how Mexico is able to substantially reduce its carbon emissions whilst at the same time grow the economy. There are many entrenched barriers to achieving it which come in the form of information gaps, regulation and trade. The report evaluates interventions that promote low-carbon development in five key sectors: electric power, oil and gas, energy end use, transport and agriculture and forestry. Each sector is subject to a cost analysis to determine the most viable intervention mechanisms that can be implemented within 5–10 years. In addition, low-carbon initiatives are analysed for each sector, and forecasts are produced to determine potential carbon savings to 2030 (ESMAP 2010)
Rwanda	The country's drive towards green growth centres on Rwanda's Vision 2050, which envisages it as developing a climate-resilient, low-carbon economy by 2050, thanks to the slightly crowded Green Growth and Climate Resilience National Strategy for Climate Change and Low Carbon Development – Green Growth Strategy. The planned programmes include sustainable land use management; integrated water resource management; climate-compatible mining; sustainable forestry, agroforestry and biomass; a low-carbon energy grid and small-scale energy access in rural Rwanda; disaster risk reduction; green industries; a resilient transport system; and low-carbon urban systems. To achieve this, Vision 2050 draws on a readiness framework composed of institutional arrangements, finance, capacity building and knowledge management, technology, innovation and infrastructure and integrated planning and data management. Overall, Rwanda's transition to a green economy relies on 'big wins, quick wins and further work' (MINIRENA 2011)
South Africa	Nhamo (2013) states that South Africa has made significant progress in putting up the necessary pillars to enhance its transition to a green economy and address issues relating to sustainability and poverty eradication; however, more work needs to be done. This includes increased budget allocations for green economy projects, improving institutional and individual capacity, better horizontal and vertical coordination and mainstreaming of the green economy agenda, and increasing knowledge management capacity. Lastly, the bias towards climate change mitigation, compared to the climate change adaptation agenda, is evident across many South African policies
Bosnia and Herzegovina	Responsibilities for green economy in Bosnia and Herzegovina are concentrated at a subnational level. There is no comprehensive strategic framework for green economy, but there are various sectoral policies with some green growth principles. Sectors with the most prospects for green economic development include green energy (biofuels), organic agriculture and eco-tourism. However, progress towards green economy in Bosnia and Herzegovina is hampered by insufficient financing, weak governance and the coordination of sectoral policies as well as an information gap (El Bilali et al. 2016)

(continued)

Table 3.1 (continued)

Country	National-level green policy review
Kyrgyz Republic	The Kyrgyz Republic is not only one of the poorest countries in the world (#10) but also one of the countries that is most vulnerable to the effects of climate change (#3). In February 2015, the government approved a set of 65 indicators to monitor and evaluate the country's progress towards a green transformation of the economy. The set of indicators is based on the OECD framework and includes both adaptation and adaptation and mitigation targets and actions (EaP GREEN 2016). Due to the sensitivity of its agricultural systems to climatic change as well as the mountainous topography of the country (land area is 90% mountainous), it is increasingly important to build resilience to these climate changes to enable communities to thrive (Kabar 2018). According to an OECD study (2016), Kyrgyzstan has communicated mitigation targets to reduce GHG emissions by between 11.49% and 13.75% below business as usual (maintaining the status quo) levels in 2030. Kyrgyzstan has also pledged to reduce GHG emissions by between 29% and 30.89% by 2030
Japan	As climate change is a global issue, agreements and treaties such as the Paris Agreement and the OECD Framework allow countries to conduct internal programmes but also to assist other countries as well. Such is the case with Japan. Internally, a series of key challenges are identified that include climate change and ageing populations which, according to the Japan national strategy, can be turned into sources of green growth. The Japanese national strategy states that market-based initiatives such as an effective emissions trading system would promote private investment and green innovation (Jones and Yoo 2011). Externally, other policies that encourage further economic integration with Asia are discussed, such as reducing agricultural subsidies and bringing down barriers to trade and foreign workers. Japan's Assistance Initiatives to Address Climate Change 2017 (Initiatives 2017) aim to accelerate climate change measures and sustainability in developing countries through 'co-innovation' by collaborating with important state and non-state actors. Offering advanced technology and know-how to address challenges, Japan is working with the private and public sectors in various Asian countries to respond to the diverse needs of each country and implement adequate adaptation actions according to the local circumstances. By matching the needs of developing countries and offering its advanced technology and service by private companies – including disaster risk reduction infrastructure technology, early-warning technology and weather index insurance utilizing rainfall data estimated by satellites – Japan will promote adaptation actions of local governments in developing countries by supporting impact assessment and development of local adaptation plans whilst involving local researchers, local governments and communities (Ministry of Environment, Government of Japan 2018)

3.3.3 Local Level

On the local-level environmentally driven citizens, understanding their different roles as entrepreneurs, consumers or employees can influence sustainability with various economic activities. Their positive impact to climate protection as well as environment and nature conservation with a distinctive awareness and knowledge about environmental issues can be enormous. Consumers and households, companies, municipalities and locally based stakeholders in the service sector, agriculture and industry can contribute to sustainability in their surroundings. Focusing on eco-

friendly start-up enterprises as well as green small and medium companies, we recognise positive efforts to achieve sustainability in several regions of the world. On the one hand, enterprises have business-based solutions, addressing structural causes of environmental degradation and problems to solve and prevent these, and, on the other hand, enterprises help achieve sustainability by the organisation of their internal and external management processes.

Existing Green Economy Trends on the Local Level

Dealing with the concept of Environmental Citizenship based on definition by ENEC (2018), several trends of green economy and sustainability entrepreneurship can be recognised in mainstream and alternative economics. The understanding of single business models and the borders of definitions of the following examples are often fluent. A broader discussion about the examples would enriched this topic. Nevertheless, we briefly list four examples:

1. The concept of eco-social enterprises: mainly driven in the social ecological economics, this means that both a mainstream and a radical perspective exist. The five key dimensions of such an enterprise are '(1) other-than-profit goals, (2) using profit to replenish nature and community, (3) democratic and localised ownership and governance pattern, (4) rootedness in place and time and (5) non-market production, exchange or provisioning patterns' (Johanisová and Franková 2013).
2. Environmentally motivated social enterprises: three main types can be differentiated. These are (1) small and locally embedded companies with local ownership and control as well as close contact to the local community, (2) expertise-oriented companies sharing and selling knowledge and (3) companies with labour-intensive services for the public sector (Vickers and Lyon 2012).
3. Eco-friendly start-up enterprises: one of the main characteristic of this type of business is facing challenges with a feasible business model in an innovative way. Nowadays, sustainability is one of the key drivers of economic innovation (Nidumolu et al. 2009), and a rising number of start-ups are focusing on ecological issues (e.g. renewable energy, sustainable consumption, eco-friendly mobility, sharing economy).
4. Companies with environmental management accounting (EMA): the engagement of small, medium and large companies regarding ecological issues is rising. More and more enterprises act in an environmentally friendly manner. The trend of greening industry processes can be already observed for 35 years within frameworks like EMAs or ISO (Freimann et al. 2016).

Sustainably driven entrepreneurship could realise both a gap-filling function and a catalytic function in a society. The first addresses the gaps left by commercial enterprises, industry companies and government bodies in provisioning critical social and environmental goods and services. These types of entrepreneurships have positive influences on disadvantaged populations and specific ecosystems (Parrish and Foxon 2006).

Concerning the economic value, we must note that eco-social entrepreneurs often do not want to build up a company where they create just economic profit and

quantitative growth. Several of their business goals like non-market production, gaining common welfare, fostering social innovation and establishing public ownership are even harder to measure than classical economic indicators such as growth, productivity and return on investment. Due to lack of measurements, the economic value on a local level is hard to identify. Nevertheless, we want to list some examples and estimates showing the economic dimension of Environmental Citizenship.

The marketplace for green business solutions is estimated at more than 200 billion US dollars (Koester 2011). In Germany, 36,400 new companies in the area of green economy were founded in 2015 and 2016, 40% of them with a business model focusing on energy efficiency, 17% on circular economy and 17% on sustainable food and agriculture (Borderstep Institute for Innovation and Sustainability 2018). In Lithuania and Ireland, a broad number of interviewed companies indicated that they are already a 'green business' and are striving to shift to 'green business' (Čekanavičius et al. 2014). Progressive steps in the framework of environmental management systems like EMAs or ISO have been realised within more than 40,000 companies worldwide in the last four decades (Freimann et al. 2016).

Opportunities and Challenges Regarding Environmental Citizenship

Based on the above-mentioned four economic trends, we must note the different economic opportunities and challenges regarding Environmental Citizenship on the local level. Some of them we want to list briefly from a company and citizen point of view.

Eco-control, as a part of EMA on operational level, indirectly influences economic performance in the context of (1) higher environmental exposure, (2) higher public visibility, (3) higher environmental concern and (4) larger size. EMA could be 'a tool fostering transparency and accountability' (Henri and Journeault 2010).

Citizens have several opportunities "to adjust" to the concept of Environmental Citizenship. Individual attitudes and values that make a change of the own consumer behaviour are crucial. The 'moralization of the markets' with the judgement of the consumers is rising (Stehr 2008). One of the positive effects of pro-environmental behaviour is the possibility of saving money by using energy in an efficient way (e.g. heating, electricity). Cutting down on unnecessary packaging material in the supermarket and reducing individual daily consumption by focusing on basic needs also have positive effects. Barry (2006) criticised firms and public bodies for adopting the language of Environmental Citizenship as motivated either by compliance with corporate environmental reporting or as evidence of a commitment to the concept of corporate social responsibility. Here, encouraging corporate employees to be Environmental Citizens is simply an integral part of either internal systems or conformity with EMSs, and such in-house Environmental Citizenship programmes will be focused on reducing costs and ensuring that the company is compliant with environmental regulations and standards. Barry describes such Environmental Citizenship as a part-time occupation – something one engages in during working hours. He calls for fostering a wider environmental awareness on the macro level political and economic dynamics of environmental problems and solutions or to connect the environmental behaviour of individuals at work with what they do outside of it (Barry 2006).

Companies are faced with economic challenges like the need for investments, the lack of equity capital and high operating costs. In addition, the often-required bondage of economic growth are a big challenge for eco-social companies with defined 'other-than-profit goals'. The efficiency of sustainable entrepreneurs will vary based on market structures, norms, rights and legislation. A deep influence in social and ecological sustainable meaning sometimes does not exist because of the game theory-based phenomena called prisoner's dilemma (Pacheco et al. 2010).

Sustainability is one of the most used buzzwords of our time. A big challenge regarding Environmental Citizenship is greenwashing. With labels like 'green', 'clean', 'organic', 'eco' and 'emission neutral', many companies are generating unjustified profit (Walther 2009). From a citizen point of view, the lack of information within certification and designation of origin and deceptive marketing of companies are big challenges.

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Chapter 4
Societal Issues and Environmental Citizenship

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4.1 Introduction

The concept of sustainability gradually became the central element of all agendas promoting social and economic development and environmental protection – particularly the Rio Declaration on Environment and Development (1992) (UNCED 1992) and Millennium Development Goals (UN 2000), as well as outcomes of the conferences organised by the United Nations (e.g. the World Summit on Sustainable Development in 2002; United Nations Conference on Sustainable Development in 2012). Societal issues have therefore become key areas for achieving a sustainable development.

In 2015, the UN adopted a new key document – Transforming our World: The 2030 Agenda for Sustainable Development – whose aim is "to end poverty and hunger everywhere; to combat inequalities within and among countries; to build peaceful, just and inclusive societies; to protect human rights and promote gender equality and the empowerment of women and girls; and to ensure the lasting protection of

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the planet and its natural resources" (UN 2015c). It also resolves "to create conditions for sustainable, inclusive and sustained economic growth, shared prosperity and decent work for all, taking into account different levels of national development and capacities" (UN 2015c). The 2030 Agenda focuses on five key issues: (1) people, (2) planet, (3) prosperity, (4) peace, and (5) partnership (UN 2015c). A special highlight of the document lies in understanding different interconnected systems and how changes in one system can cause effects in others. There are several global frameworks related to the 2020 Agenda for Sustainable Development: Paris Agreement (UN 2015a), Sendai Framework (United Nation Office for Disaster Risk Reduction 2015), and New Urban Agenda. The implementation of the New Urban Agenda contributes to the achievement of the Sustainable Development Goals (SDGs) and targets, including SDG 11, to make cities and human settlements inclusive, safe, resilient, and sustainable. It further recognises that culture should be taken into account during the promotion and implementation of new sustainable consumption and production patterns that contribute to the responsible use of resources and address the adverse impact of climate change (United Nations General Assembly 2016).

In light of the complex nature of socio-environmental issues of the contemporary world, the chapter focuses on selected societal issues to show their interconnectedness and consequences. In this chapter, we will elaborate on some of the most important socio-environmental transformations of the twenty-first century that an Environmental Citizen needs to know about and act upon. The chapter focuses in particular on the processes of urbanisation, transportation, and tourism as important social and societal factors of contemporary life. These can be seen as sources of opportunities for sustainability but also as causes of serious socio-environmental problems. Cities produce 70% of the GDP, which is a critical trend in contemporary societies and transportation plays a vital role in human lives through regional organisation and the development (UN 2017). In this chapter, we explore how these issues can be considered sustainability issues and how they present contexts within which Environmental Citizenship is manifested. Deeper consequences are presented on the example of the struggle for maintaining culture diversity and heritage, endangered by all of the previously mentioned processes.

To promote sustainable ways of dealing with the above-mentioned issues, the promotion of Environmental Citizenship seems to be necessary. Environmental Citizenship represents the responsible pro-environmental individual and collective behaviour of citizens who act and participate in society as agents of change in the private and public sphere, on a local, national, and global scale (ENEC 2018).

4.2 Cities, Landscapes, and Cultural Diversity

Nowadays, globally, more people live in urban areas than in rural areas, with 55% of the world's population residing in urban areas in 2018 (UN 2018). It is expected that between 2015 and 2030 there will be an additional 1.1 billion new city dwellers,

growing the global urban population by 28%, from 4 billion to 5.1 billion (UN 2015b). Sustainable urban development requires integration and extensive coordination between all local and national authorities, including land use planning, urban agriculture, water resource management, energy-related authorities, employment opportunities, technology, transportation infrastructure development, waste management, etc. (Al Zubi and Radovic 2018).

Cities occupy approximately only 2% of the total land. Nevertheless, while producing 70% GDP, they manage to spend over 60% of global energy consumption and are responsible for 70% of greenhouse gas emissions and 70% global waste (UN 2017). Although urbanisation has the potential to make cities more prosperous and countries more developed, many cities worldwide are grossly unprepared for the multidimensional challenges associated with urbanisation (UN 2015b). Decision-makers too often only focus on the technical aspects of sustainable city development, such as energy reduction and efficiency, sustainable building materials, or compact settlement structures, without acknowledging the importance of building social capital or social networks (Mössner 2016; UN 2015b). Therefore, Environmental Citizenship becomes recognised as an important factor in sustainable developments and community plans. Environmental Citizens are able to identify the underlying structural causes of environmental degradation and environmental problems and have the willingness and the competencies for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means and taking into account inter- and intra-generation justice (ENEC 2018).

While broadly adopted by many countries, notably in the EU where the active contribution is reported regionally and the trends and territorial considerations nationally, one cannot but ask how come *territory* – in its many differences, needs, and offers – has been left aside from the big focus on urbanisation. Moreover, territories are usually relegated as either beautiful touristic scenery or restricted sites of *wealth* due to resources, which are so often exploited ignoring the impacts on the global sustainable future of them as complex, whole, and unique units.

The development of cities depends on different economic, social, and environmental factors, as well as the position of the city in the more complex urban and transport system. In this case, the geographic position is pivotal (e.g. harbour cities, urban settlements along critical commercial lines, such as the silk route). Geomorphology and hydrography restrain or shape a specific city or town making it unique.

The interdependence between *urbs* and *rus* (Latin etymology, in the origin of urban and rustic, respectively) has always signalled a close relationship between town and country. Furthermore, it was agriculture that led to the creation of the foundations of cities, from the first human settlements, holding a fertile land that would be able to feed and protect some community-liberated humans from everlasting nomadic life.

Until the nineteenth century (specifically the beginning of WWI, 1914), the direct link between the rural estates that provided for food and other resources and

the urban areas bounded by walls and ring roads with their tolls was still the key to understanding the mechanisms of the territories.

In Southern Europe, a city is deeply rooted in the territory from which it develops, primarily through the legacy of classical culture with a strong connection to the place and its foundation. In this light, people hold such a tectonic sense of belonging to a specific place that one could say that the urban fact grows from some local seed, embedded on the ground, shaped by physiographic elements – the land, the water – gradually revealing the fabrics that artificially fabricate the landscape. These are cultural and societal traits that usually respect the balance and nature of each place. Youngsters and the elderly learn the importance of bonding with the community and reinvent the site where they live (Viganò 2010; Dematteis 1995). The community gives a new meaning to these sites by introducing new practices, values, and actions. This way the community tightens more closely to the area in which it lives, giving it a strong sense of place.

A territory is always specific to a place, a landscape, ways of living, and culture. These circumstances make it possible to recognise and distinguish one area from another. They allow someone to identify as being "from there". Hence, giving importance to the grounds that hold human occupation, over functional schemes, allows for a better perception of how they evolve in space and time in their morphological, systemic, dimensional coherences (Gaspar 2003). According to various authors and organisations (e.g. WEF/World Economic Forum), we are currently experiencing the dawn of the Fourth Industrial Revolution, where omnicality, the Internet of Things, and artificial intelligence will provide an augmented perception of reality or, even, an alienation from specific space and time (Schwab 2015, pp. 3–11). Hence, when data overcome information and frequently substitute knowledge, and the media interferes in so many dubious ways in civic and democratic values, is it even possible to implement an active Environmental Citizenship, and how can it be implemented in some vital societal domains, as cities, landscapes, and cultural heritage?

These are some of the concerns that the will be further discussed in this and other chapters, under the scope of Education for Environmental Citizenship.

4.3 Vital Issues of Transportation

Transportation is another major societal issue that plays a vital role in human lives through the organisation and the development of space. As an activity of the transportation of people, goods, energy, and information from one place to another, this enables people to satisfy their daily needs and functions (Gasparovic and Jakovcic 2014). Transportation could be defined as one of the fundamental life functions. The three components of sustainable development could also be addressed through the impact of transportation, corresponding to Environmental Citizenship. Transportation is a markedly spatial activity whose influence is visible in space. This influence is

reflected through its environmental, societal, and economic impacts. These three impacts are integral and have to be analysed together.

The main aim of sustainable transportation is to promote better and healthier ways of meeting and satisfying people's needs and functions by reducing the social, economic, and environmental impacts of their mobility modes. Sustainable transportation tries to achieve these aims by reducing resource inputs and waste outputs and minimising the effects of transportation on the public realm (Schiller et al. 2010). Given that transportation is one of the primary human activities, it could be concluded that sustainable transportation promotes easier access to basic life functions (e.g. work, education, shopping, leisure) and the use of healthier and economically more cost-effective modes of travelling (e.g. walking, cycling, public transport) that affect both the individual and the environment by reducing pollution and traffic density.

The interrelationship between transportation and Environmental Citizenship can be noticed when transportation and environmental issues are discussed. It is necessary to emphasise that the impact of transportation on the environment is significant. Transportation is one of the most abundant energy and petroleum consumers. Transportation is the fastest-growing contributor to air pollution through carbon dioxide emissions, thus becoming a significant contributor to global warming. Transportation also generates pollution through nitrous oxides, carbon monoxide, and particulate matter (Ionescu 2017).

The significance of transportation is noticeable through its responsibility for around a quarter of EU greenhouse gas emissions. Therefore, it is the second biggest greenhouse gas-emitting sector after energy generation (Stroe et al. 2017). Transportation is responsible for 19% of the world's energy consumption and 23% of carbon dioxide emission production (Chu 2012). In the EU, the transportation sector is responsible for a large share of greenhouse gas emissions, i.e. it contributes 27% of the total EU-28 greenhouse gas emissions (including aviation and shipping) (EEA 2018) and for 33% of all energy consumption (EEA 2008). In the United States, ground transportation consumes almost 30% of the primary energy and is responsible for 27% of the greenhouse gas (GHG) emissions (Gosse and Clarens 2017). In California, car transportation is responsible for 38% of GHG emissions, and other pollutants have been linked to significant health impacts (Chester et al. 2017). Bongardt et al. (2013) have stressed how important the road transportation is globally, which has a share of 69% of all carbon dioxide emission related to transportation in general. However, other modes are also significant contributors; (inter) national shipping contributes with 14% to carbon dioxide emission, aviation with 10%, rail transportation with 2%, and other modes with 5%.

An additional problem is the pronounced dependence on car transportation. Nowadays, 1.2 billion vehicles are on the road (Sperling 2017). It could be emphasised that transportation (especially the dependence on car transportation) and urban land use lead to environmental, economic, and social problems for the sustainability of cities (Schiller et al. 2010).

In addition to environmental pollution regarding GHG emissions, the significant impact of transportation is noise pollution. An additional problem is land use since

the environment is being irreversibly destroyed by the construction of transportation infrastructure (e.g. roads, railway tracks, airports, ports).

Apart from the environmental component, both the economic and social component are essential part of sustainable transportation. Transportation aims to connect by enabling mobility through access to various activities. Appropriate mobility and accessibility are the basic requirements of today's globalised society (Hoyle and Knowles 1998). However, mobility and accessibility could be hindered or limited, and in this case, the usage of transportation services could be threatened leading to transport disadvantages. This in turn would cause problems relating to employment, health, education etc., which would eventually lead to serious social disadvantages. Transportation disadvantages could also lead to (transportation based) social exclusion. Vulnerable social groups, such as the elderly, children, disabled, pregnant women, and single parents, would be affected the most. Transportation disadvantages could also affect people living in poorly connected areas. Thus, people who are forced to use a car because of poor public transportation will also be affected. This will have an additional impact on their home budget, with particular concern for the poorer population.

In addition to transportation disadvantage and social exclusion, the social aspect of sustainable transportation also relates to the security and safety issue. A growing number of cars will cause traffic jams leading to delays and an increased fuel consumption associated with rising costs. Transportation sometimes takes over valuable land (e.g. agricultural) through compulsory purchase aimed for transportation infrastructure (new railroads, airports, parking lots, motorways, etc.), which is a permanent loss. Indirect costs will arise due to health problems associated with greenhouse gas emissions, reduced mobility owing to car dependence, as well as injuries and deaths caused by traffic.

Many technical and technological inventions are being used to try and reduce the impact of transportation on the environment. These include improved fuel efficiency, reduced motor emissions, and systems that control the traffic flow on major roads or streets (Schiller et al. 2010). Electric-powered, hybrid, or hydrogen-powered cars could also be included. In addition, many countries in various ways are trying to reduce individual vehicle emissions by reducing the number of vehicles. However, these efforts did not contribute to the reduction in the number of vehicles on the roads. An increase is also present in air transportation (Ionescu 2017). It is necessary to reduce the negative impact of transportation on the environment. Therefore, new possibilities and improved existing ones are necessary as well as the development of new and more efficient forms of transportation.

Public transportation could be considered to be an efficient solution to take large numbers of people in and out of cities and urban areas (Cahill 2010). Public transportation systems are often considered to be "transportation environmental impact reducers", and this relates to the new, modern, and more efficient modes. Life-cycle environmental impacts will be reduced by implementing certain public transport solutions, which would have a significant local and remote energy and environmental impact beyond vehicle operation (Chester et al. 2017). Beside regular bus and tram networks, some more sustainable and efficient ways of public transportation

have also been developed in some cities. These include bus rapid transit (BRT) and light rail transit (LRT), together with metro and heavy rail systems. Relatively new but an environmentally friendly mode of transportation in certain cities is the funicular railway. To connect more distant areas, for example, the city centre, to outer suburbs or commuter towns, suburban railways represent a good example of sustainable and environmentally friendly way of transportation. High-speed rail should also be emphasised as an efficient way of public transportation.

Of course, walking and cycling are sustainable ways of transportation due to their favourable impacts on health, financials, and environment. However, in order to make this more attractive, big improvements in the walking and cycling environment and public spaces need be made, since many streets and roads are not suitable due to a lack of cycle paths and on-street parking, etc. (Cahill 2010).

When sustainable transportation is discussed, it should be emphasised that it is a societal process rather than a strictly technical one. Sustainable transportation depends upon spatial and transport planning and policy, economics, and citizen involvement. One of the main aims of sustainable transportation is lowering financial costs to all social groups. This could be achieved through decreasing dependence on automobiles as the primary mode of individual mobility (Schiller et al. 2010), with walking, cycling, and public transport as alternatives. Transportation development should also aim to increase safety and security. It should be emphasised that transportation should promote an equity aspect for all social groups and citizens so that a fair society could be achieved, with a better quality of life and healthier environment.

With regard to the Environmental Citizenship discussion, it is possible to emphasise various measures in transportation to achieve a cleaner environment, but also to achieve more economic and socially equitable citizenship. Some soft measures (i.e. smarter choices) could be proposed (Cahill 2010; Cairns et al. 2004): travel plans (i.e. work or school), personalised travel planning, public transport information and marketing, travel awareness campaigns, car clubs, car sharing, teleworking, teleconferencing, and home shopping.

To achieve Environmental Citizenship and become a responsible pro-Environmental Citizen, it is important to approach to the transportation in an appropriate way. It means accepting transportation as one of the most prominent factors in everyday lives. On the other hand, it is also important to rely on more environmentally friendly and sustainable modes of transportation. For example, walking, cycling, and public transportation are pro-environmentally oriented transportation modes and could be acceptable to an Environmental Citizen. On the other hand, it is also necessary to educate people in the most suitable way on the advantages and disadvantages of transportation modes in a sense of environment protection. Only synergy between the willingness in becoming an Environment Citizen and the Education on Environmental Citizenship can result in achieving Environmental Citizenship. Transportation could adopt environment, and environment could adopt transportation, but the key factor is a human with his awareness on the necessity of environment protection.

4.4 Forms and Approaches of Tourism

Throughout the last century, the societal issue of tourism has grown into one of the most important wealth providers while at the same time being one of the main causes for environmental degradation. These issues will be problematized in this section, and ways forward for the informed Environmental Citizen will be suggested.

The development of tourism after WWII was generated primarily by raising the average income in developed countries (especially in Europe, the United States, and Canada), more free time (paid holidays), and technological advances in transport (especially in road and air transport). Growing tourism demand in *mass* or *conventional* tourism predominantly is based on an inexpensive and standardised tourism product that enables a greater volume of tourism, particularly within the areas of coastal (*sun and sea*) and ski tourism (Cavlek et al. 2011). However, in the 1980s after only 30 years of intensive development, mass coastal tourism (particularly in the Mediterranean) started to experience slower growth and stagnation. On the supply side, the stagnation was partly due to outdated infrastructure and, significantly, the degradation of the environment in all tourism areas particularly in developing and sensitive areas. Those destinations could not compete anymore to *new* Mediterranean and long-haul destinations. On the demand side, responsible were the changes in the demographic structure and travel preferences at tourist markets. New generation of tourists, that was more conscious of environmental degradation and unhealthy way of living in the large cities, preferred destinations with preserved environment, which consequently imposed new environmental standards in tourist destinations.

Tourism had many positive effects, especially on the agile economic development and raising income and living standards (Sulc 2016, 2017). However, environmental degradation in tourism regions soon threatened tourism itself by damaging the main attraction basis.

Faced with these problems and having adopted the paradigm of sustainable development, new concepts of tourism development were introduced, ranging from diversified and *sustainable coastal tourism* to *new*, *soft*, or *alternative* tourism.

Most of them are under the umbrella of *sustainable tourism*, introduced as a new approach to tourism development that takes full account of its current and future economic, social, and environmental impacts, addressing the needs of visitors, the industry, the environment, and host communities (UNWTO 2005). It can be applied to different forms of tourism, ranging from mass coastal tourism to specific forms, like ecotourism, and it refers to the environmental, economic, and sociocultural aspects of tourism development (UNWTO 2005). Sustainable tourism requires all stakeholders to:

1. Make optimal use of environmental resources as a critical element in tourism, maintaining essential ecological processes and helping to conserve natural heritage and biodiversity

2. Respect the sociocultural authenticity of host communities, conserve their building and living cultural heritage and traditional values, and contribute to intercultural understanding and tolerance
3. Ensure viable, long-term economic operations, and provide socio-economic benefits to all stakeholders that are equitably distributed, including stable employment and income-earning opportunities, social services to host communities, and poverty alleviation contribution (UNWTO 2005). These elements of sustainable tourism correspond to the concept of sustainable citizenship

The Global Code for Ethics in Tourism explicitly promotes sustainable tourism and Environmental Citizenship, particularly in the recommendations that treat tourism as a factor for sustainable development, a user of cultural heritage, and a contributor to its enhancement (Articles 3. and 4.):

1. All stakeholders in tourism should safeguard the natural environment and achieve sound, continuous, and sustainable economic growth to equitably satisfy the needs and aspirations of present and future generations.
2. Tourism resources belong to the common heritage of mankind; the communities in whose territories they are situated have particular rights and obligations to them.
3. Priority should be given to the forms of tourism development that are conducive to saving rare and precious resources, in particular water and energy, as well as avoiding possible waste production
4. Tourism infrastructure and activities should be programmed to protect the natural heritage and preserve endangered species of wildlife (and impose limitations and constraints on activities exercised in particularly sensitive areas, e.g. desert and coastal, polar, or high mountain areas).
5. Tourism policies and activities should treat artistic, archaeological, and cultural heritage; particular care should be devoted to preserving and upgrading monuments, shrines and museums, as well as archaeological sites, which must be widely opened to tourists (UNWTO 2001).

Therefore, classical mass tourism in coastal destinations has been partially transformed in order to meet the requirements of sustainability. The methods of applying sustainability range from very strong sustainability (where natural resources have an intrinsic value and are worth saving in their original condition, no matter their potentially positive impacts on the society) to very weak (that allows the use of natural resources according to the market demand and it is focused on economic growth) (Turner 1993).

New tourism is characterised by flexibility, by the segmentation of tourism demand and supply, and by the development of new forms of customised experience, offering a variety of choices to tourists (UNWCED 1987). New forms of tourism promote an approach that is more sensitive, by giving priority to natural and cultural resources in planning and development (Triarchi and Karamanis 2017). The term *soft tourism* originated in the Alpine countries and focuses on the forms of tourism that feature attention towards environmental issues and the promotion of

ecologically friendly development policies (Triarchi and Karamanis 2017). It promotes in particular the use of public transport, e.g. modernised traditional mountain railways that represent attractions in themselves or cable cars instead of private cars to prevent traffic congestion and pollution.

The term *alternative tourism* is comprised of different forms of tourism based on the special motivation of visitors, as opposed to mass or conventional types of tourism. Since it includes some forms of travel that can include a large number of visitors (e.g. cultural tourists), it has been replaced by the term *special interest tourism*. Although there is no widely accepted definition of these terms, they are characterised by having a higher awareness of environmental issues and protection, a more delicate approach to social issues by connecting to the local community, and an emphasis on experiencing the destination by all senses (e.g. by seeing attractions, by listening to sounds and/or music, by eating local food and drinking wine, by experiencing local culture, by adopting new cultural values, tolerance, etc.). Consequently, special interest tourism aims to increase positive impacts of tourism and reduce its negative impacts on the destination area.

These new approaches to tourism have many common characteristics with Environmental Citizenship and do involve Environmental Citizens. A good example is volunteer tourism, where participants are active agents of change in destination areas: being helpful to other (economically marginalised) people (e.g. building traditional houses), working in disaster areas (e.g. after the 2010 Haiti earthquake), or helping to preserve the environment (e.g. at the bear orphan refuge on Velebit Mountain in Croatia).

New or *soft tourism* materialised in various new forms of tourism (e.g. ecotourism, geotourism, nature-based tourism, heritage tourism, adventure tourism), as well as new approaches to tourism (e.g. ethical travel, *slow* tourism, and community-based tourism). Nature tourism and ecotourism are particularly important for enriching and enhancing the experience; they respect the natural heritage and local populations and are kept within the carrying capacity of the sites (UNWTO 2001).

Ecotourism is defined as responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education (TIES 2015). Environmental Citizenship provides a cradle to these characteristics by aiming to (1) minimise physical, social, behavioural, and psychological impacts of tourism; (2) build environmental and cultural awareness and respect; (3) deliver memorable interpretative experiences to visitors that help raise sensitivity to the host country's political, environmental, and social climates; and (4) design, construct, and operate low-impact facilities (TIES 2015). Unlike other forms of tourism motivated by visiting nature (e.g. nature-based tourism, tourism in protected areas), ecotourism is distinguishable by the motivation and responsible behaviour of tourists towards the environment. It builds directly upon Environmental Citizenship, since visitors have to be highly conscious of the environmental values of the destination areas and must act in ways that preserve the sensitive environment. It also requires a high level of Environmental Citizenship from the local population, in the way of good tourism and spatial planning, actions, and consciousness on the value of the environment.

Nature-based tourism, on the other hand, is widely defined as leisure travel undertaken largely or solely for the purpose of enjoying natural attractions and engaging in a variety of nature-based activities (Ecotourism Australia n.d.). It can encompass different and potentially incompatible activities, such as wildlife viewing or ecotourism, scuba diving, boating, skiing, or walking in alpine areas (Pickering and Weaver 2003). Nature-based tourism can include both sustainable and unsustainable activities. However, since it is based on the natural environment, its tourists are required to be Environmental Citizens to increase benefits for the destination area and to preserve the environment.

Another form of tourism that is related to Environmental Citizenship is geotourism, defined as visiting geosites for passive recreation, engaging a sense of wonder, appreciation, and learning (Newsome and Dowling 2005). The term geosites comprises areas with specific geological and geomorphological features and processes, as well as the natural resources of the landscape, landforms, fossil beds, rocks, and minerals (Newsome and Dowling 2005). Beside the features themselves, the focus is on the processes that formed such features. A positive instance of Environmental Citizenship with tourism stakeholders is the Škocjan Cave in Slovenia, a UNESCO World Heritage site that despite universal attractiveness has managed to maintain the visiting level below the estimated carrying capacity. The daily number of visitors is limited, and the cave can be visited only in a scheduled guided tour several times a day.

Elements of Environmental Citizenship may be applied to all forms of tourism by using different approaches and concepts of development. One of the most used in the literature on tourism is *responsible tourism*, defined as an approach that aims to minimise adverse impacts of tourism on the environment and maximise its positive contributions to local communities (Fabricius and Goodwin 2002). The key element of responsible tourism is to take responsibility and action to make tourism more sustainable, referring to all stakeholders in tourism: operators, hoteliers, governments, local people, and tourists (The Earth Changers 2017).

Similarly, the core of *conscious travel/tourism* is the consciousness of the effects and consequences of tourism: travellers who make their own travel decisions and are conscious of the potential impacts and alternatives, bringing benefit to the world through their heightened awareness (The Earth Changers 2017). On the other hand, Andriotis (2002) uses a narrower definition of conscious tourism and associates it with labour-intensive, endogenous, alternative, and small-scale and enclave tourism development.

Although *ethical tourism* lacks a standard definition, it is usually mindful of travel choices and is based on the awareness of the values that prevent environmental impacts during travel (The Earth Changers 2017). However, that label cannot be easily associated with a form of tourism or a touristic business, as it requires a more profound analysis on how it affects economic and social development of the local community as well as the environment (see Butcher 2008).

Environmental Citizenship can be directly applied to previous three approaches to tourism in terms of the environment, since all of them put a lot of attention on preserving the environment and efforts to limit pollution and environmental

degradation in different aspects – travelling (e.g. using public transport instead of private cars), accommodation (e.g. staying in traditional houses or hotels with vernacular architecture instead of uniform global chain hotels), consumption (e.g. eating traditional food made of locally produced ingredients), and other activities (e.g. participating in local cultural events, using bicycles as local transport, visiting different tourist attractions not only major ones, separating waste).

Another concept is *slow travel* or *slow tourism* (Lowry and Lee 2011), which was initially associated with gastronomic tourism and created as a reaction to fast living, conventional *Sun and Sea* concept, an escape from hectic lifestyles, and the enjoyment of life's simple pleasures. It evolved gradually from the concept of the Italian slow food movement in the late 1980s. The next step was branding *slow cities* (*CittaSlow*), towns that pass through a rigorous process of certification, with excellent local food and preservation of the local environment (Matos 2004). Therefore, slow tourism is associated with ethical commitment of the part of the travellers, who make a conscious choice to minimise any negative impact that they might have on the environment or the community, as well as their choice to purchase from local providers (World Travel Market & Euromonitor 2007). Matos (2004) points out essential characteristics of slow tourism: simple accommodation, a healthy diet, a leisurely pace, local culture, a peaceful atmosphere, and respect for the natural environment. One of the most famous rural areas of this type is the Chianti Region in Tuscany, Italy, which is inevitably connected to Environmental Citizenship from both the host and the guest. The area with rich natural scenery consisting of picturesque hills with vineyards and restored old houses, associated with good local food and wine, was branded as one of the earliest and most famous destinations of rural tourism, primarily driven by the efforts of the local population and their consciousness on the value of the region. Visitors are also highly motivated to experience the region using all senses, but they are also highly conscious of the uniqueness of the area and are prepared to contribute to its preservation.

All analysed forms and concepts of tourism require elements of Environmental Citizenship by both hosts and guests, taking into account the environmental, economic, and social impacts of tourism, in order to achieve the sustainable development of destination areas.

4.5 Tangible and Intangible Cultural Heritage

Equality and justice among different countries and societies are promoted in contemporary documents, in particular the 2030 Agenda. It focuses on improving availability of education, health services, transportation, sanitation, human rights etc., but it also stresses culture as an important element of sustainable development. The most visible and present form of culture involved in the concepts of sustainability is represented by tangible and intangible cultural heritage. In this section, we will discuss the importance of cultural heritage for Environmental Citizenship.

While the UNESCO 1972 Convention (UNESCO 1972) considered cultural heritage to be strictly physical (monuments, groups of buildings and sites), the UNESCO 2003 Convention (UNESCO 2003) widened the scope, to include intangible aspects of cultural heritage: "…the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith…". This tangible-intangible dimension of cultural heritage could be promoted by the Framework Convention on the Value of Cultural Heritage for Society (Council of Europe 2005), which recognised the need for a holistic approach to cultural heritage, "a resource for sustainable development and quality of life in a constantly evolving society". The Faro Convention obligates the Parties to "promote cultural heritage protection as a central factor in the mutually supporting objectives of sustainable development, cultural diversity and contemporary creativity" (Council of Europe 2005; article 5). Environmental Citizenship should be in accordance with the Faro Convention, demanding solid knowledge on cultural heritage diversity, appreciation, and protection.

Tangible cultural heritage usually refers to all cultural artefacts from the past that are perceived as valuable. Environmental Citizenship mostly focuses on historical buildings or constructed units, which are protected not only because of their physical characteristics but also as documents of knowledge, which had been collected, shaped, and transferred through many generations. It is particularly visible in the vernacular architecture or 'architecture without architects' (Rudofsky 1987), which expresses "the cultural diversity anchored in the specificities of territories" (Guillard 2014). The VerSus project (VERSUS, Heritage for Tomorrow: Vernacular Knowledge for Sustainable Architecture, 2008–2013) showed that vernacular architecture all over the world has embodied principles of sustainability in various creative ways (Correia et al. 2014).

Based on the analysis of numerous examples, VerSus has identified *socio-economic* and *sociocultural* key principles to protect the cultural landscape, transfer construction cultures, enhance innovative and creative solutions, recognise intangible values, and encourage social cohesion. In addition, it promotes principles of *environmental sustainability* by respecting environmental context and landscape to the benefit of natural and climatic resources, to reduce pollution and waste materials, contribute to human health and welfare, and reduce the natural hazard effects of vernacular architecture. The VerSus project did not dismiss any of the vernacular building practices as old-fashioned, overcome, or primitive, but it considers them as a collection of knowledge, produced by anonymous builders who adopted the building practice to the diversity of environments, overcame constraints, and made the best use of available resources (Guillard 2014).

Tradition and innovation are not necessarily opposed. Due to the close relation of man and nature in the past, the knowledge gained through centuries could nowadays be employed in order to achieve sustainability. Although the relationship between vernacular architecture and sustainable buildings has been realised and explored throughout the last two decades, we should not only consider the preservation of the material aspects of cultural heritage (architecture) or the knowledge of how to produce it (building crafts, intangible aspect) but also regain the positive image of our

heritage. For example, after the WWII, vernacular architecture and traditional building crafts in the Balkans were viewed with contempt and a want to embrace new artificial building materials instead (Dragisic and Dordevic 2014).

The Environmental Citizen and Education for Environmental Citizenship are both expected to strengthen the awareness of the cultural context, not to exclude any inherited practice as obsolete but to respect cultural differences and protect the entire world cultural heritage, regardless of the nation or geographic region. An Environmental Citizen is an inhabitant of the Earth and whose knowledge is stored in various cultural traditions. In order to adequately sustain the cultural heritage of humanity for future generations, it is important to develop an awareness of its importance and complexity. Pivotal actions would not limit its interpretation by the currently accepted measures of its preservation and safeguard, but as suggested in the document Culture 21: Actions (2015) (United Cities and Local Governments 2015), thus including it in education, cultural skills, knowledge, intercultural dialogue, tangible and intangible heritage, and cultural rights. This is one of the important issues for Environmental Citizens.

4.6 Conclusion

This chapter presented the role of Environmental Citizenship in selected key human societal activities as observed in the 2030 Agenda. It has explored how Environmental Citizenship is inseparably related to the evaluation of the territory and urban development, transport systems, cultural heritage, and tourism. It has demonstrated that, although Environmental Citizenship focuses mostly on the environment, it has to be involved in all paradigms of socio-economic development to make the human activities more sustainable. The previous analysis has shown, for instance, that Environmental Citizenship has played a great role in the innovative and sustainable means of carbon-free transport, increased energy efficiency, and the achievement of economic and social equal citizenship.

Furthermore, as stated in the 2030 Agenda, the trends of environmental degradation have to be reversed, not only to preserve the environment by itself but also to solve (or at least reduce) some of the most important and severe current problems – hunger, extreme poverty, unhealthy living environments, climate changes, major war sites, and conflicts that lead to impressive migration, to mention just a few. Some of these problems are a result of unequal allocation of environmental resources and therefore strongly require a high consciousness with environmental problems and individual and collective actions to resolve them and improve the environment.

The chapter also presents examples of sustainable approach to important human societal activities that have already been applied somewhere and have obtained favourable results. They can be used as examples of good practice that can be implemented elsewhere. For example, the successful use of an inherited built environment can be used as a lesson of building materials, techniques, and principles of planning and building. However, one has to keep in mind that sustainable practices

will not be immediately adopted everywhere and that it is a long-lasting process. For instance, as stated earlier in the text, new forms and approaches in tourism are getting more attention among (potential) tourists, but mass forms of tourism (e.g. coastal, ski, massive cultural tourism) still have the largest share of the tourist market in the world.

The key change from an unsustainable to sustainable approach towards the environment and various human activities lies in education. Therefore, it is not a question of whether Environmental Citizenship should be included in the education curricula, but it should be implemented in all levels of education as soon as possible. Another way of strengthening Environmental Citizenship is participation in volunteering initiatives, which may be considered as a potential tool for shaping the attitude of improving community character and cohesion.

Finally, this reflection intends to open questions for further discussion and research, particularly related to the role of Environmental Citizenship in sustainable urban planning and transport systems, sustainable use of cultural heritage and sustainable tourism, and the forms of voluntarism movements and initiatives that could serve to sustainable societies. The significance of volunteering stems from the notion that this helps to not only develop solidarity directly linked to the idea of preserving social cohesion but also to build social, cultural, and human capital based on one of the objectives of the Lisbon Strategy to promote a knowledge-based society by encouraging non-formal learning (Keranova 2014).

Individuals can be given opportunities to act as Environmental Citizens in different contexts, for example, within their local community, or with regard to national or global considerations. Local initiatives have a particular potential to deliver environmental improvements and social justice.

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Part II
Environmental Citizenship as Psychological Construct

Chapter 5
Knowledge and Environmental Citizenship

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5.1 Environmental Citizens Need Knowledge

The environmental impacts of modern consumer-oriented societies are jeopardising the high standard of living and have brought humankind to the threshold of Earth-carrying capacity (Goleman 2010; Sagoff 1995). Today we are forced to find ways to overcome the challenge of the overconsumption by humans of the fundamental planetary boundaries that are essential to sustain current human civilisation (Rockström et al. 2009). The sensibility to preserve natural resources is still present

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all over the world, most often in the remote, inaccessible parts of the planet of inborn communities, e.g. the native populations of the Arctic Circle, small villages in Tibet and those who live in the Sahara or on remote islands in the Pacific. These communities survive only by understanding and adapting to the natural systems around them, designing the ways of life that best communicate with these natural systems (Goleman 2010). Modern societies will be forced to reacquire knowledge and ecological intelligence in order to preserve human civilisations. It is the wisdom and ability to adapt to our ecological niche so as to inflict as little damage as possible and relive sustainably (Goleman 2010; Orr 1992).

This wisdom of knowledge is required for Environmental Citizenship and as such should be within the focus of Education for Environmental Citizenship. Citizens are made in a long and complex process of political socialization through education, media and popular culture (Cao 2015). An Environmental Citizen requires the knowledge of holistic and fundamental aspects of environmental sciences (Hay 2002). These sciences investigate the relationships and interactions of living organisms with other living organisms and their surrounding physical environment (adaptations on the habitat conditions). Environmental science is a diverse and complex field that involves all living or non-living things, including physical, chemical and other natural forces. It also includes various habitat conditions where living organisms (biota) find and fulfil their requirements and consists of two components (biotic and abiotic). The term 'ecosystem' describes the ensemble of interactions within the environment in a systematic way (Scholz 2011). The system boundary of an ecosystem can be established by an observer in order to emphasise on specific aspects of an ecosystem, e.g. the whole Earth or a single drop of water (Sachs 1995).

Over the last few decades, the concept of Environmental Citizenship, as an intersection between environment, civil society and the state, has gained prominence in the domain of both environmental policy and academia (Dean 2001). Despite the widespread use in various arenas, this concept still remains a rather vague aggregation of two similarly elusive and contested concepts – environment and citizenship.

Depending on a particular context, Environmental Citizenship is treated as a theoretical ideal-type, a normative concept, a practical tool or even a practice that should be studied upon. The concept becomes even more complex when Environmental Citizenship is observed in relation to the opposing political traditions (liberal, republican, cosmopolitan) or environmental discourses (eco-modernization, ecofeminist, radical ecology, etc.) (Barry 2006; Hay 2002; Valencia Saiz 2005; Hannigan 2014; Cao 2015).

Indeed, a distinction between Environmental Citizenship, as a liberal and reformist articulation of the relationship between citizens and the environment, can be distinguished from the more radical ecological citizenship (Dobson 2003; Cao 2015). Environmental Citizenship can also be defined as 'pro-environmental behaviour' in public and private, driven by a belief in fairness of the distribution of environmental goods, participation and co-creation of sustainability policy (Dobson

2010). It is about the active participation of citizens in moving towards sustainability.

Environmental Citizenship is a notoriously difficult concept to define, and there is no widespread consensus of its meaning. However, in line with Dobson (2010), the European Network for Environmental Citizenship (ENEC) consortium has put forward a shared definition that essentially sees Environmental Citizenship as a specific kind of behaviour: the responsible pro-environmental behaviour of citizens who act and participate in society as agents of change in the private and public sphere, on a local, national and global scale, through individual and collective actions, in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing a healthy relationship with nature. This includes the exercise of environmental rights and duties, as well as the identification of the underlying structural causes of environmental degradation and environmental problems, the development of the willingness and the competences for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means and taking into account inter- and intra-generational justice (ENEC 2018). According to the ENEC definition, Environmental Citizenship could be regarded as a specific bundle of environmental rights, duties, responsibilities, knowledge, awareness and willingness to engage for the protection of the common environmental good. This definition of Environmental Citizenship as essential and specific behaviour or set of behaviours within specific context includes environmental as well as citizenship issues and suggests that individuals need both environmental knowledge and citizenship knowledge from these bodies in order to develop their Environmental Citizenship.

5.2 Which Knowledge and How to Acquire It?

There is an urgent need to boost transition to those citizens and communities who are informed, who understand the human impact on the world and who are able and feel empowered to act individually and collectively for sustainability (Mortello and Jasanoff 2004; Derzkzen et al. 2017; Ripple et al. 2017).

This transformation requires a formal and non-formal education that is close to reality, one that fosters the understanding of what is happening in our world, develops critical thinking and democratic competencies and reveals universal values (social justice, wisdom, synergy with nature, equality, inner harmony, responsibility, creativity, self-respect, etc.). Together, these elements (reality, understanding, competencies and values) have to be part of the learning process and of the outcome of this education (Russ 2015).

Knowledge is essential, but fostering knowledge alone in Education for Environmental Citizenship, without links to real life, personal experiences, competencies and values, is insufficient and pointless for the sake of a sustainable world. We also want to emphasise that a distinction is needed between knowledge and

understanding. The understanding of an issue is a process that combines and embeds personal, local, strategic and specialized contributions to knowledge. The green critics of science and knowledge confront heuristic understanding with rational science responsible for environmental threats (Hay 2002).

This explains how knowledge is about knowing the facts and understanding is about the insight and experience of how processes work and how the outcome can change accordingly and how processes can make significant changes in individual relationships to the environment. However, we argue that knowledge and understanding are both important and necessary for the development of potential Environmental Citizenship in individuals. This line of thought is developed below, under the heading of 'types of knowledge'. You can teach a person but it still doesn't mean that a person is educated. Only when the acquired knowledge is applied as a daily behavioural model can we say that it is understood and learned. More than to know is necessary to understand, which the latter means knowledge + empathy. Environmental sensitivity is a predisposition to taking an interest in learning about environment, feeling a concern for it and acting to conserve it (Kollmuss and Agyeman 2002). According to Chawla's (1998) research, the most important experiences that define environmental sensitivity are childhood experiences in nature, experiences of pro-environmental destruction, pro-environmental values held by the family, pro-environmental organisations, role models (teachers or friends) and education.

Since the 1980s, environmental education began to be part of citizen education and path of convergence, and nowadays environmental education is often called Education for Environmental Citizenship (Cao 2015). In order to exert environmental rights and perform environmental duties, citizens need to have an adequate understanding of the environmental challenges and the acceptable ways of reducing potential risks and harm (Valdivielso 2005). Therefore, education that focuses on the development of environmental or ecological values, knowledge, skills and competences should be considered as an important factor in development of Environmental Citizenship. Education for Environmental Citizenship needs integrated systems of knowledge which focus on the understanding of human-environment interactions and on the links between knowledge and actions for sustainability (Ergen and Ergen 2011). The process of knowledge production and how it is 'used' in Education for Environmental Citizenship makes the difference to sustainability (Brosius 2006; Russ 2015). However, an increase in knowledge and awareness does not necessarily lead to pro-environmental behaviour (Kollmuss and Agyeman 2002). Environmental knowledge is a subcategory of environmental awareness, and emotional involvement is what shapes environmental awareness and attitude. There are many more factors that influence pro-environmental behaviour, 'situational factors' that include economic constraints, social pressures and opportunities to choose different actions – demographic-external factors (institutional, economic, social, cultural) and internal factors (motivation, environmental knowledge, awareness, values, attitudes, emotion, locus of control, responsibilities, priorities). Different models have been developed to explain pro-environmental behaviour in its complexity (Kollmuss and Agyeman 2002).

Education should encompass two types of literacy – ecological literacy and civic literacy. The first can be understood as the ability to use ecological understanding, thinking and habits of mind for living in, enjoying and/or studying the environment. Civic literacy, on the other hand, can be defined as the ability to use an understanding of social (political, economic, etc.) systems, skills and habits of mind for participating in and/or studying society (Berkowitz et al. 2005; Olson and Worsham 2012). This implies that Education for Environmental Citizenship should be interdisciplinary and would have the ability to integrate the knowledge developed within environmental (natural) sciences with the relevant knowledge coming from the realm of social sciences. We explore this issue further, under the heading of 'topical knowledge'.

Being aware of the complexity of the environmental knowledge, certain authors proposed a digest curriculum that would be comprehensible for the majority of the population. For instance, Berkowitz et al. (2005) were inspired by Paul Risser's definition proposing the following four elements:

1. Multimedia transport of materials
2. Clarifying the 'everything is connected to everything' concept
3. Ecology-culture interactions
4. Familiar ecological field observations based on a specific, local 'spot'

Berkowitz et al. (2005) developed a framework consisting of three components:

1. *Understanding* of five *key ecological systems*: (a) one's home community (ecological neighbourhood) and ecosystem, (b) the ecological basis of human existence, (c) the ecology of the systems that sustain us, (d) the globe as an ecosystem and our impacts on it and (e) genetic/evolutionary systems
2. *Building* the disposition, skills, and capacity for *ecological thinking* (scientific or evidence-based thinking, systems thinking, transdisciplinary thinking, spatial thinking, temporal, quantitative, creative and empathic thinking)
3. The *nature of ecological science and its interface with society*

On the 'social' side (civic literacy) of the knowledge that is important for Environmental Citizenship, it could be argued that concepts and theories developed within the scope of environmental sociology, environmental psychology and environmental political science are of particular value. This body of knowledge consists of, but is not limited to, the following: environmental values, awareness and behaviour, environmental activism and movements, environmental/climate justice, environmental inequality, environmental decision-making, environmental governance, environmental communication and media, risk construction and environmental discourses, etc. (ENEC 2018).

According to M. Boström (2012), the term sustainable development is not a very useful theoretical concept for social scientists to understand the relationship between society and nature or for the study of environmental governance, management and communication. The 'social' has to do with the entire relationship between society and nature, which includes economic, cultural, political and institutional structures and processes. It is therefore appropriate and feasible to create a civic sense in the

society about the sustainability issues that are associated with civic citizenship education, civic awareness and civic participation (Awan et al. 2014). The concept of civic sustainability (to be able to think and act) empowers change in society. Education serves for the formation of innovative skills with the key learning goal of understanding that sustainability and sustainable development focus not only on a responsible relationship with nature but on questions of values, justice, equity and our relations with each other (Awan et al. 2014).

Education can be formal, informal and/or non-formal. Formal education is related to the process with environmental courses being a major channel of dissemination of environmental knowledge. Research and environmental initiatives endorsed its importance as a way of educating learners with sound environmental knowledge and achieving behavioural change. Environmental Citizenship can be regarded as a primary goal of formal environmental education. Nevertheless, in spite of its importance, and certain improvements that have occurred in the last few years, environmental education is still in the peripheral position within most education systems across the world (Berkowitz et al. 2005).

Informal education, on the other hand, could be a lifelong process connected to different phases of each individual's life course (Williams 2005). Informal environmental knowledge can be a result of self-teaching and do-it-yourself practices that are typical for individuals who are inclined to environmental topics; it could be a part of work-related socialization (e.g. working for a company that deals with environmental issues) or family socialization (children who have environmental education classes in school can socialize their parents, who perhaps did not receive that kind of formal education, into more environmentally friendly practices); or it could be an outcome of the personal encounter with environmental problems and related environmental activism (Escobar 1998). However, it should be noted that the scope of informal education is rather limited since Environmental Citizenship demands a certain level of civic and ecological literacy. Environmental issues often need adequate expertise and scientific equipment in order to be identified and understood (Yearly 1992; Hannigan 2014). Lay, or ordinary, environmental knowledge is limited to personal experiences and local issues. Informal education refers to the experiences of everyday living from which we learn something. This includes education gained from the value of the Internet, through newspapers, magazines, television, radio or discussions with friends and neighbours, and conversations with children about their environmental learning experiences.

Non-formal education refers to organised activities that are outside of educational institutions, such as learning networks, churches and voluntary associations. This includes education that occurs due to participant involvement with government agencies, conservation or environmental groups, zoos and environmental learning centres such as nature centres, parks and science museums (Digby 2010). While local practical knowledge can sometimes be very important in alerting the scientific community to new environmental threats (the local population tends to be the first to notice changes in the local environment, such as the outbreak of the Zika virus), a certain level of expert (global) knowledge is essential for Environmental

Citizenship. This kind of knowledge is primary acquired through the process of formal education.

Hannigan (2014) talks about the importance of practical knowledge on the environment that often originates from the everyday experiences of, for example, villagers and small farmers. 'This ordinary knowledge is accumulated within local grassroots networks by breathing air, drinking water, tilling soil, harvesting forest produce and fishing rivers, lakes and oceans'. However, 'in contemporary societies, where the media and education penetrate even peripheral regions, local knowledge is a mixture of traditional knowledge, knowledge based on the local people's own observations and popularized science' (Hannigan 2014).

5.3 Topical Knowledge

Knowledge provides a precondition for pro-environmental behaviour. There are three different forms of factual environmental knowledge: (i) knowledge about how the environmental system works, (ii) knowledge of how to achieve resource conservation and environmental preservation and (iii) knowledge about the effectiveness of behaviours in terms of achieving best resource conservation. Environmental system knowledge can motivate action-related and effectiveness knowledge that together promote person's environmental behaviour. Environmental knowledge can be divided into environmental system knowledge, action-related knowledge and effectiveness knowledge (Roczen et al. 2014).

Increasing public awareness regarding the importance of environmental sustainability and the promotion of universal values are a way to reinvent knowledge of the environment among the general public, to answer questions about how knowledge about human-environment interactions can be used to develop practical strategies to encourage pro-environmental behaviour and create sustainable environments (interdisciplinary collaboration). We should all have the congenial recognition about work of environmental systems and the operation of natural processes; however, civilisation brought us to live in more artificial surrounding and to lose the sensibility to natural processes understanding. That is the reason for raising awareness of the Environmental Citizenship as a way of integrating the environment into citizenship questions. This is to the extent to which a model of citizenship, centred on the individual, comprehends citizenship as a status that grants individuals legal protection and allows them to pursue their private interests, bearing in mind that critical environmental issues (environmental risks), such as ozone depletion, nuclear waste and climate change, transcend national borders and demand transnational solutions and cooperation (cosmopolitan citizenship).

Natural ecosystem functioning in its original form (ecological or biological approach) would mean a natural system that would be undisturbed by human interventions. This would call for an extensive protection of nature from human use and overexploitation. Whenever there is a scarcity of resources or if a living (biotic) resource is in danger of deterioration or extinction, conservation should be a reaction to remove

the resource from human use. Economic viability is the most important aspect of sustainability, while social and ecological aspects are realised mainly incidentally.

5.4 Types of Knowledge

Several relevant definitions and typologies of knowledge are put forward by different authors. Frick et al. (2004) consider that there are three types of knowledge forms that must work together in promoting conservation behaviour:

- *System knowledge*, or the understanding of the natural states of ecosystems and the processes within them
- *Action-related knowledge*, when people know what can be done about environmental problem
- *Effectiveness knowledge*, or knowledge about the benefit (effectiveness) of environmentally responsible actions

Roczen et al. (2014) have recently applied this typology of knowledge to their competence model for environmental education. The model itself specifically addresses the relative importance of knowledge in the causation of pro-environmental behaviours and specifies that affective factors (such as connectedness to nature (Frantz and Mayer 2014) and environmental values (Bogner and Wiseman 2004)) are more accurate predictors of such actions. At the same time, the model does give a central role to knowledge, and it clarifies that not all knowledge is equally important. Systems knowledge (or factual knowledge over the environment) in this competence model has no direct effect on the environmental behaviour of individuals. There are the two more applied forms of knowledge that do have an effect: knowing how to perform actions (action-related knowledge) and being able to distinguish between several options. Which one has what impact on the natural environment appears to be an important precondition for environmental action-taking by individuals. These findings have significant implications for the design of the curricula that aim to foster Environmental Citizenship. Such curricula should clearly include important emphases on applied knowledge and allow for learners to acquire knowledge and understanding of possible actions that can contribute to addressing specific environmental problems. Does this then mean that in such curricula there is no need for systems knowledge? If we look back at the competence model for environmental education from Roczen et al. (2014), it becomes clear that while systems knowledge has no direct impact on environmental action-taking by individuals, it does contribute to building both action-related knowledge and effectiveness knowledge. Indeed, while systems knowledge in itself is not enough, the two applied forms of knowledge cannot be built in the absence of systems knowledge.

In addition to the three types of knowledge in the competence model described above, there is also a fourth type: social knowledge. This is occasionally included, chosen individually based on personal preferences, standards and existing social ties (Hanna 1995). According to Frick et al. (2004), knowledge structure is crucial

in practice for designing knowledge-based campaigns and educational curricula. It is explained that the understanding of a problem (system knowledge) can lead to the ability to acquire action-related knowledge, while basic scientific knowledge alone cannot lead to the target behaviour. However, even if a person knows what actions need to be taken, the final decision will be based on effectiveness knowledge, which is in line with the findings of Roczen et al. (2014). Boeve-de Pauw and Van Petegem (2018) show that the lack of impact of the educational programmes on students' environmental actions could be due to an absence of focus on the applied types of knowledge in formal education. According to these conclusions, knowledge-based education should focus on all three knowledge forms. Environmental education aim should be to foster expectations about the impact or effectiveness of individual behaviour as a necessary additional input to promote desired behaviour in the society and surrounding.

5.5 Knowledge Use and Production

Bruckmeier and Tovey (2008) proposed four variants of understanding and practising resource management for sustainability and clear differentiation of types of knowledge that will be applied in resolving individual approaches to optimal resource management:

- *Scientific approach* (especially ecological) is used as a *guiding knowledge* in the resource renewal. This approach means managing the renewal of resources during use or after, e.g. sustainable forest management, energy consumption reduction (ecological modernization).
- *Managerial-political knowledge* is guiding knowledge in the quality of life approach. The quality of life approach means the resource is managed to improve some conception of local quality of life (access to water, fuel, landscape, health).
- *Local knowledge* is crucial in the management of a resource to provide improved sustainable local livelihoods.
- Different knowledge forms, scientific, managerial and local become *combined* when the resource is managed through the participation or cooperation of those who have an interest in it being sustained. Participatory resource management including local resource-dependent stakeholders, scientists, global actors and resource-dependent animals all become involved, and there is no longer one generally dominant knowledge form.

While scientific knowledge is mainly explicit, well documented, institutionalized and sequential, local knowledge is experiential, informal, simultaneous and often tacit (lay knowledge) (Rahman 2000; Bruckmeier 2004). Local knowledge sometimes overlaps with traditional knowledge, although the dynamics of the succession of these types are different (Bodorkós et al. 2005). Managerial knowledge is often combined with political-managerial knowledge (Bruckmeier and Tovey 2008).

But we can also distinguish the difference between local and global knowledge (Tovey 2008). Local knowledge is often explained as 'traditional', 'indigenous' or 'ethnic' – the knowledge systems held by local boundary and distinctive cultural groups (Brosius 2006). Global knowledge is identified with the extension of western sciences and technological knowledge into global knowledge. Knowledge in its different forms and combinations can help to reconnect social and natural systems. Knowledge management is the application of knowledge as an element of the larger processes of social interaction, knowledge and social capital building, which aims to unify scientific, managerial and local knowledge (Tovey 2008).

Knowledge use requires a broader view, including generation, codification, dissemination, application and assessment. When these dimensions of knowledge process are included, knowledge becomes visible in action and practice. Knowledge is socially distributed in different and unequal forms and often faces problems associated with achieving successful cooperation (problems of inequality, social exclusion, power differences and conflicts). It is under the conditions of inequalities and unequal opportunities, differentiated ownership and access to and control over resources. The relationship between experts and the lay citizen is also eroded in the public sphere. The inclusion in knowledge to local, lay actors such as consumers, citizens, patients and clients has become a central issue for environmental sustainability projects (Tovey 2008).

Environmental knowledge should be produced as an interdisciplinary or transdisciplinary approach that uses a diversity of methods to provoke citizen-environment interactions and to build a natural environment influence on citizen and citizen behaviour to make positive changes in the environment. The process of the production of knowledge in Education for Environmental Citizenship encompasses a transdisciplinary approach:

- A bottom-up approach – co-production of knowledge (experts and citizens)
- Participatory process (allows the network of knowledge holders – from local knowledge to shared knowledge)

Education for Environmental Citizenship could unify environmental education, education for sustainability, science education and citizenship education, so the knowledge included in the focus of Education for Environmental Citizenship should come from these different types of educations.

Environmentology as a new term can be explained as a science discipline that includes a complex of other sciences (biology, ecology, sociology, environmental sciences, economy, politics, psychology, etc.) and brings a multidisciplinary approach to understanding and acting pro-environmentally. It includes empathy and concerns natural and cultural heritage for the future of the planet and its inhabitants.

Co-creation between the expert and the lay citizen is central to the idea of a participatory approach to the production of knowledge (Weber and Khademian 2008). It could manifest itself as a new form of action research of natural resource governance. It replaces the traditional politics of expertise with the recognition that there are multiple ways of knowing, evaluating and acting towards socio-natural

systems over time. Sustainability is strongly shaped by differences in culture, historical experience and economic and environmental conditions. The four pillars approach for social, economic, cultural and ecological (or environmental) sustainability aims for the achievement of balanced economic development, social inclusion and environmental protection (Bruckmeier and Tovey 2008; Boström 2012). Interdisciplinary collaboration provides a different view on the phenomenon, while in combination they provide a comprehensive picture on the problem (architecture, geography, social and cognitive psychology, environmental science). Sustainability can be seen as a guiding idea rather than as a target point of development (Kelemen et al. 2008). Sustainability planning requires the involvement of a wide range of actors with different forms of knowledge, interests and value commitments, and in an ideal situation knowledge-sharing among these actors may become the source of community learning. The participatory approach to knowledge production and the development of expertise is a platform of interaction between participants in sustainability planning and combining different types of knowledge to assure the above-mentioned sustainability (expert, scientific, managerial, tacit or lay) flows into the same project (Csurgó et al. 2008).

5.6 Conclusion

The concept of Environmental Citizenship includes knowledge, awareness, responsibility, consciousness, ability and respectful behaviour towards the environment both at an individual level and a societal level. It should therefore be perceived as the guiding lifestyle option for future generations. However, in order to adopt such a lifestyle, Environmental Citizenship should be clearly defined, while at the same time misconceptions such as 'the environment only concerns ecology' should be abolished. There has been a growing concern throughout the last few decades about the damage that human activities have caused to the environment. No single person gets up in the morning and decides to intentionally contribute to climate change, destruction of the ozone layer, deforestation, etc. What appear to be harmless daily decisions/actions often have far-reaching consequences on the planet. The aim should be to make everyone aware of their ecological footprint (defined as the influence of the everyday activities of every individual person on the planet Earth) through Environmental Citizenship. The goal of this chapter is to emphasise the need to establish an Education for Environmental Citizenship that includes basic knowledge from the very beginning of our educational system. This would be achieved by focusing the knowledge gained in these two pillars: (i) relevant knowledge to Environmental Citizenship and (ii) which instrument decides on the knowledge gained through (formal and non-formal) Education for Environmental Citizenship.

An education programme with an emphasis on 'environmentology' could provide a conceptual conscientious approach to life and the planet's resources. It should

also emphasise the need for in-depth environmental scientific knowledge and understanding so that sustainable solutions are provided. It should also highlight the inherent diverse nature of the environment and its different aspects in every scientific and social field. The knowledge gained should assist in the application of environmental ethics in every human activity. Physical boundaries should not inhibit the application of environmentology but rather enhance its implementation in everyday life in order to preserve natural and cultural heritage for the future generations.

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Chapter 6
Values, Beliefs and Environmental Citizenship

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6.1 Introduction

Persuading people to become Environmental Citizens is crucial for addressing current environmental issues. It is a necessary condition for sustainability and has been identified as one of the EU's priorities (EEA 2015; EU 2013; Dobson 2007). Educating individuals and communities to become Environmental Citizens is one of the challenges of our time if we are to achieve sustainable growth and preserve our natural environments. Environmental Citizenship as a complex of actions and behaviour is based on the acknowledgement of the balance of rights and responsibilities in fairer human-environment bonds, which tend to transcend national and generational boundaries (ENEC 2018). Specifically, Environmental Citizenship

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refers to pro-environmental actions both in public (consumption patterns, political actions, active participation, etc.) and private (recycling, conserving resources, etc.) domains performed by citizens and induced by the belief in fairness of the distribution of public resources (Dobson 2007). It becomes increasingly obvious that efforts need to be made on a local level (regional, national, in one's home town, in one's neighbourhood, etc.) so that we can achieve global sustainability goals. Environmental Citizenship is an umbrella term that encompasses an array of characteristics such as the skills, knowledge, attitudes, values and beliefs needed to address environmental problems (Takahashi et al. 2017). Thus, educating European society to become Environmental Citizens is a crucial step that needs to be taken quickly, systematically and with a strong evidence basis for actions. If we are to educate individuals not only to act pro-environmentally but also to understand the urgency of environmental issues and to integrate pro-environmental actions into the core of their political participation and citizenship expressions, we need to tackle all of the aspects of Environmental Citizenship. Moreover, all aspects that comprise Environmental Citizenship need to be tackled specifically and with precision. In this chapter, we will discuss how beliefs and values relate to Environmental Citizenship and how we can target these aspects in order to educate Environmental Citizens in Europe and worldwide.

We will give particular focus to beliefs, because they are arguably at the core of all human behaviour (Fishbein and Ajzen 2011). There are many ways individuals form beliefs, but belief formation is mostly a function of the interaction of environmental factors and innate traits (Poškus 2017; Fishbein and Ajzen 2011). Thus, beliefs can be formed through systematic means, such as education, but they can also develop naturally through observing one's surroundings. However, the end result will still be different for different individuals, since individual characteristics and subsequent subjective experiences and interpretations influence the way we perceive the information that we receive from the external environment (Poškus 2017).

To address the individual difference perspective, we will also discuss values as individual characteristics or, to put it in evolutionary terms, as factors that lead to typical strategies to achieve the proximal and ultimate goals (Poškus 2018; Lindenberg and Steg 2013) that are formed through the interaction between individuals and their environment (Feather 1979), as well as through the socialisation process. Values can function as heuristics that determine how individuals approach situations and what goals they put above others (Schwartz 1992). Values can potentially be formed and changed through education (Myyry et al. 2013; Krishnan 2008; Chatard and Selimbegovic 2007). This is key for educating Environmental Citizens, since, despite some innate components that are associated to personality traits, most individuals have the capacity for change in their value orientations, adapting them based on how their environmental influences change. For example, Inglehart and Baker (2000) in their study of 65 societies have found that economic development was linked to value shift towards '…increasingly rational, tolerant, trusting, and participatory'. For Environmental Citizenship to thrive, we need to make salient the appropriate values and provide alternative, environmentally friendly behavioural strategies that lead to environmentally friendly belief formation when faced with

unfamiliar situations where decisions need to be made (Lindenberg and Steg 2013). Thus, making pro-environmental values salient has a potential to create coherent moral frameworks that shape behaviours in everyday situations that would result in one being an active Environmental Citizen.

6.2 Relating Values and Environmental Citizenship

Environmental Citizenship as a holistic framework of addressing environmental problems has only begun to be investigated through the lens of values (Jagers and Matti 2010). This is due to the fact that Environmental Citizenship is a relatively new concept of defining pro-environmental actions and their driving forces, and it is a unifying term for a holistic pattern of pro-environmental behaviours (ENEC 2018). Furthermore, Environmental Citizenship at its core is based on such values as the fairness of the distribution of environmental resources, civic participation and co-creation of sustainability policy, among others (Schild 2016). With this in mind, there are studies that relate separate components of Environmental Citizenship (various pro-environmental actions) with values (Steg et al. 2014a, b; van der Werff et al. 2013, 2014); while values, in turn, touch some of the societal motivations and beliefs (i.e. social norms, Abrahamse and Steg 2013) that are key for Environmental Citizens (Stern et al. 1999). What needs to be emphasised is that Environmental Citizenship has a strong political and societal basis, as well as a basis in education. It is not enough that one should act pro-environmentally, one needs to have a pro-environmentally oriented understanding and a frame of mind that compels one to act pro-environmentally.

Different patterns of value orientations can lead to different behavioural strategies and ways that individuals attain their proximate and ultimate goals (Huang and Bargh 2014; Lindenberg and Steg 2013). All values can be roughly classified into either self-transcendence or self-enhancement, openness to change values or conservation values (Schwartz 2012). Self-transcendence values encompass goals related to selflessness and helping others; these values have an opportunity to be at the forefront of one's actions if one perceives their environment to be safe. To put it in evolutionary terms (Fischer 2017), self-transcendence goals are adaptive when one has resources which can be shared in order to gain favour from the community. Self-enhancement values encompass goals that lead to accumulation of resources through self-serving means; these values are most adaptive in scenarios where the environment is unstable and one's security is unclear or under threat. Openness to change values encompass goals that relate to experiencing novel stimuli and having new experiences, which in evolutionary terms means seeking out new opportunities and engaging in high-risk high-reward behaviours that might lead to favourable proximal outcomes (Poškus 2018). Conservation values encompass goals of stability and conformity that lead to tried-and-true outcomes and thus are low risk with consistent rewards. It must be noted, however, that adaptive traits lead to outcomes that are adaptive for most individuals most of the time, but not necessarily all indi-

viduals all of the time (Dawkins 2006); thus, there are instances where individuals may hold values that are seemingly in contradiction to their environment. All of these four broad categories are comprised of more goal-specific values that address specific domains that have a closer relationship with behavioural tendencies.

Despite values being quite stable, there is evidence that values are malleable, especially as a result of life-changing events (Bardi and Schwarz 2013; Bardi and Goodwin 2011; Bardi et al. 2009; Maio et al. 2009; Rokeach 1968), and all individuals have all values to a certain degree (Schwartz 2012). Individuals form their specific value orientations through choosing what is most adaptive in their present environment and what maximises their fitness (Bardi and Schwartz 2013; Bereczkei et al. 2010; Bardi et al. 2009). When a certain pattern of values is formed, individuals use this framework to understand and interact with unfamiliar environments and situations, all the while adjusting their values accordingly. In other words, individuals' existing value orientations and the environmental stimuli they encounter function reciprocally, one affecting the other and vice versa. In this sense, values as a framework for interacting with the external environment have the potential to address all relevant areas of Environmental Citizenship.

Given that the concept of Environmental Citizenship encompasses not only pro-environmental actions but also the beliefs and the motivation or mindset that lead to those actions, activating relevant pro-environmental values can lead to positive changes in all aspects of Environmental Citizenship since values are goal specific and not behaviour specific (Steg et al. 2014a, b), i.e. one's goal can be to save the environment, and this acts as an heuristics in acquiring new beliefs and acting in novel situations in a way that is congruent with this goal (Bardi and Schwarz 2013). There is therefore the potential for a simple behavioural spillover (when change in one's behaviour leads to changes in other behaviours) (Thøgersen 2012), where moral frameworks develop in order to minimise the cognitive load in making behavioural decisions, and also for holistic attitudinal shifts towards more sustainable lifestyles.

6.2.1 The Value Basis of Environmental Citizenship

In the broadest sense, values can be categorised into groups that reflect the dominating attitudes that drive one's behaviour and form one's worldview (Kaltenborn and Bjerke 2002; Kortenkamp and Moore 2001; Thompson and Barton 1994; Dunlap and Van Liere 1978). In light of the contemporary environmental issues, three broad views can be identified: anthropocentrism, ecocentrism and technocentrism. Anthropocentricists have in general a self-oriented view of the world and see it as something that belongs to them and others. However, through the increased understanding of human-nature relationships and through the realisation of contemporary environmental issues, a more environmentally oriented outlook has emerged, where humans are viewed as a part of the environment while taking environmental well-being as the ultimate goal. The aforementioned view that emphasises environmental

needs above human needs (while not ignoring humans) is termed as ecocentrism. Lastly, technocentrists view humans as masters of nature and believe that nature needs to be preserved through modern technology and purposeful effort (Bailey and Wilson 2009; Papert 1988; O'Riordan 1981). While technocentrism might seem a promising worldview for the modern individual, there is no clear consensus whether being more ecocentric or technocentric would lead to better environmental outcomes, and in some cases, the line between these two can become blurred. All of the aforementioned views are reflected in contemporary measures that are used to assess values relevant to pro-environmental behaviour and Environmental Citizenship (Nordlund and Garvill 2002, 2003).

To date, there is no single study that can lend an insight into how value orientations relate to all the components of Environmental Citizenship. However, there are many studies on how values relate to a very important component of Environmental Citizenship – pro-environmental behaviours (Steg et al. 2014a, b; Thøgersen and Ölander 2002). While, at first, researchers explored the possibility of all values proposed by Schwartz to be related to pro-environmental actions (e.g. Schultz and Zelezny 1998; Karp 1996), later studies settled on four value orientations, namely, hedonistic, egoistic, altruistic and biospheric values (Steg et al. 2011; Nordlund and Garvill 2002; Stern et al. 1999; etc.). These values seem to have the most practical significance and make the most theoretical sense.

Hedonistic values are usually negatively related to pro-environmental actions, since they are often in direct conflict with environmental outcomes (Steg and De Groot 2012). For example, a strongly hedonic individual will tend to sacrifice the environment for their own pleasure, since environmental goals are not at the forefront of their behavioural decisions. Despite that, it is possible to align hedonic values to lead to environmentally friendly outcomes, for example, by providing pleasurable incentives for them; however, these types of solutions would be in conflict with the idea of Environmental Citizenship, since it assumes an intrinsically pro-environmental value basis. Egoistic values, just as hedonic values, are usually negatively related with pro-environmental actions (Steg and De Groot 2012). However, there might be situations where egoistic motives lead to seemingly altruistic actions if they produce a desirable outcome to the individual (Dawkins 2006), because egoistic values drive individuals towards self-serving strategies of increasing individual fitness and maximising one's resources, often at the expense of others or at least without regard for them.

Altruistic values drive behaviours that lead to self-transcending outcomes that, although lead to a loss of individual resources, do not necessarily lead to a loss of comparative fitness. Altruistic values are usually related to all socially desirable behaviours and therefore to pro-environmental behaviours as well (Steg and De Groot 2012). However, altruistic values are not the best predictor of pro-environmental actions, since altruism is a general strategy that might encompass actions that lead more to an increased feeling of well-being for other individuals, but not necessarily to the environment. In simpler terms, altruism is more people oriented than environment oriented.

Biospheric values can be regarded as a subset of altruistic values or as a very closely related construct that results in actions that lead to environmentally favourable outcomes (De Groot and Steg 2009; Stern 2000). Some research, however, has provided compelling evidence for interpreting biospheric values as a separate construct on their own since they provide unique variance in explaining pro-environmental behaviours (De Groot and Steg 2007). As a matter of fact, biospheric values are the best predictor of pro-environmental actions out of all proposed values that might relate to it; thus, they are often put at the forefront at pro-environmental behaviour research and often have a prominent role in predictive models (e.g. Values-Belief-Norm (VBN) theory hedonic, Stern 2000; Stern et al. 1999; Values-Identity-Personal (VIP) norm model, Van der Werff and Steg 2016).

Individuals can hold varying patterns of values and, therefore, there is a multitude of ways of constructing a strategy for behaviour (Bardi and Schwartz 2013; Lindenberg and Steg 2013). It seems reasonable that in order to promote Environmental Citizenship, one should aim for a specific pattern of values, where altruistic and biospheric values work in tandem to create a socially engaged and environmentally conscious individual (Fig. 6.1). As mentioned earlier, value change is possible only under specific conditions, e.g. during extreme changes in one's life, when it is required to adapt to new circumstances. Therefore, value change requires systematic efforts. The desirable pattern of values should be constantly and consistently reinforced, either through social persuasion or through infrastructural solutions, since any one-time intervention towards values is likely to be short-lived (Bardi and Goodwin 2011). To put it simply, the context of an individual needs to be consistently reinforced and even requires upholding certain values in order to

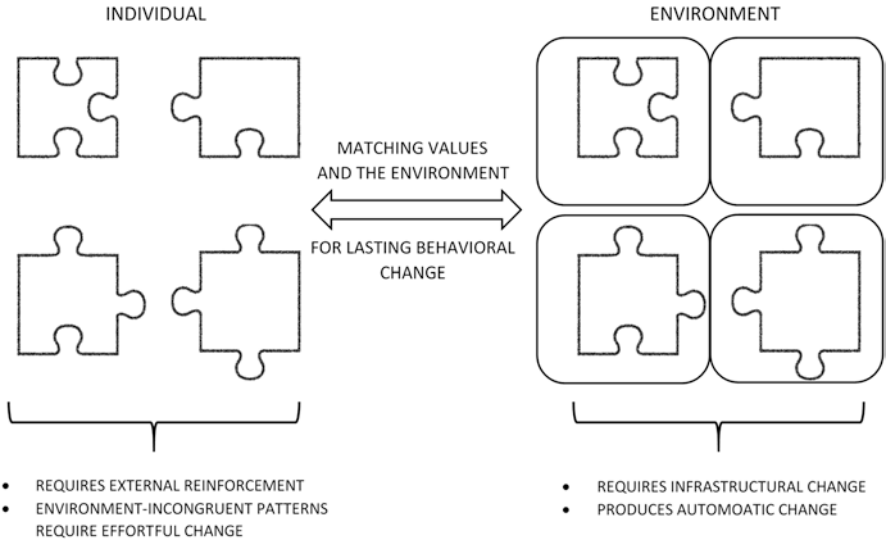

Fig. 6.1 Conceptual model of interaction of individual value patterns with the environment. The environment determines the value pattern that is most likely to emerge automatically

achieve a lasting change in individual values, since values function just as any other cognitive schema that influences behavioural choices based on environmental cues (Bardi and Goodwin 2011). What are the implications of the knowledge on value stability/change in fostering an environmentally conscious society? First, an education system that consistently reinforces desirable pro-environmental values is needed. Second, the environment needs to reinforce and enable pro-environmental behaviour and in turn provides reinforcement for pro-environmental values.

6.3 Relevance of Belief Formation on Environmental Citizenship

There are two popular ways of thinking about beliefs. The first one is the conventional way of understanding beliefs, for example religious beliefs, political beliefs and other socially and culturally relevant beliefs. This type of understanding implies that there is no specific perception about behaviour-outcome relations but rather a set of convictions that one might hold. The aforementioned understanding is more akin to how people talk about beliefs in their everyday lives. In psychological terms, beliefs can be defined as subjective probabilities of specific actions leading to specific outcomes (Fishbein and Ajzen 2011). This definition emphasises the subjective cognitive component of beliefs and is very behaviour specific. On the one hand, we have a lay understanding that encompasses a set of beliefs, while on the other hand we have beliefs as behaviour-specific subjective probabilities of actions leading to certain outcomes. In this subsection, we will discuss Environmental Citizenship in the context of both definitions; however, we will be focusing more on the cognitive definition of beliefs, as individual beliefs are more prone to change and are more malleable through education and experience.

From the cognitive perspective, beliefs can be classified into being observational, inferential and informational (Fishbein and Ajzen 2011). Observational beliefs are formed through the direct observation of one's actions leading to certain outcomes and are therefore based on experiential factors and hands-on activities. Inferential beliefs are formed through observing others' behaviour and making inductive conclusions on how certain actions lead to certain outcomes; therefore, these beliefs are a product of observed examples of behaviour. Lastly, informational beliefs are formed indirectly through information that is learned from external sources such as teachers, documentaries and public service announcements (PSAs) and without directly performing any actions or observing the outcomes of actions being performed. Therefore, informational beliefs are best formed through educational means (although it must be stressed that education should not be reduced to only providing information, and hands-on experience is also key in providing high-quality education).

An important point about belief formation is that beliefs are not assumed to reflect objective reality (Fishbein and Ajzen 2011). It is crucial to understand that

both personal experiences and the observation of others' behaviour can lead to beliefs that are not necessarily reflective of objective reality, and while these beliefs can be useful in a practical sense and seem to predictably lead to desirable outcomes, this does not imply that the beliefs themselves are factual. For example, one might have a subjective belief that bottled water is healthier than tap water, and their belief would be reinforced with positive experiences of drinking bottled water. The subjective component of beliefs is further emphasised in the case of informational beliefs, since these beliefs are formed without any direct observation of outcomes of actions and thus have the most degrees of freedom where information that is not factual can be transmitted and internalised.

The subjective nature of beliefs has tremendous implications for Education for Environmental Citizenship (ENEC 2018). First of all, education that aims at creating Environmental Citizens needs to address all three channels of belief formation; thus, individuals need to be exposed not only to information but need to experience the outcomes of their actions first-hand and see similar experiences in others. This calls for a systematic and integrated approach that presents congruent information through all available channels: educating Environmental Citizens requires not only education but also infrastructural, societal and political changes, all of which should be factual and based on a common framework of transmitting information that promotes the components of Environmental Citizenship.

It is not only crucial that existing efforts of promoting Environmental Citizenship be factual and congruent among various channels of information, but it is also especially important to counteract the belief formation that is not based on facts which can mislead individuals into acting against the principles of Environmental Citizenship. Thus, when addressing beliefs, we not only need to form them, we also need to dismantle existing incorrect beliefs and we need to accomplish this not through coercive means, but through gentle nudges, factual information, direct experiences and activities that show that pro-environmental actions are demonstrably beneficial and desirable.

6.3.1 Predicting and Explaining Environmental Citizenship Through Beliefs

Beliefs are at the core of two predictive models that are largely used to predict and explain actions relevant to Environmental Citizenship. These models are the Values-Belief-Norm (VBN) model (Stern 2000; Stern et al. 1999) and the Theory of Planned Behavior (TPB) (Fishbein and Ajzen 2011; Ajzen 1991). Both of these models are useful in pro-environmental behaviour research; however, the VBN model was created as a specific model for predicting and explaining pro-environmental actions, while the TPB is a general model for predicting and explaining behaviours.

The VBN model integrates both values and beliefs and infers a causal relationship between them. While one can make a good case for values and beliefs having reciprocal relationships, in the VBN model, values act as predictors of normative beliefs which, in turn, predict moral norms that form behaviour. Thus, in this model, values are assumed to be linearly associated with beliefs and affect them directly (Stern et al. 1999). This allows for a practical understanding of how educational strategies could be tailored towards value education, i.e. educational strategies could be targeted at instilling pro-environmental values in the hope of individuals developing pro-environmental moral beliefs that would lead to actions congruent with Environmental Citizenship.

In the TPB model, three types of beliefs are used to predict behaviour: attitudinal beliefs, normative beliefs and control beliefs (Fishbein and Ajzen 2011). These beliefs then form attitudes, personal norms and perceived behavioural control, all of which are used to predict behavioural intention, which, in turn, predicts behaviour (Fishbein and Ajzen 2011). Attitudinal beliefs reflect the subjective appraisal of behaviours and their favourability and desirability. Normative beliefs reflect the perceptions of whether behaviours are desirable and prevalent, as well as which behaviours are punished or rewarded. Lastly, control beliefs reflect the subjective perception of whether actions would be easy to perform and whether these actions are afforded by the available environment. The TPB offers an applicable framework of how specific behaviours can be targeted through forming all of the aforementioned types of beliefs.

The three types of beliefs used in the TPB model and the three types of belief formation mechanisms all need to be utilised in order to most effectively promote Environmental Citizenship. For example, attitudinal beliefs need to be formed not only through information that certain behaviours are worthwhile but also by providing first-hand experience of how certain pro-environmental actions can be pleasurable. Similarly, it is not sufficient just to tell someone to recycle (forming informational beliefs), but it is necessary to show good examples of recycling (forming inferential beliefs) and provide opportunities to recycle (forming observational beliefs). Thus, the TPB allows for a structured way of addressing education for Environmental Citizenship and ways of forming values that would lead to favourable outcomes.

6.4 Using Values and Beliefs to Understand and Promote Environmental Citizenship

While the VBN model proposes a direct relationship between values and moral beliefs, the relationship between values and beliefs should not necessarily be conceptualised in this way. We assume that values might share a goal component with beliefs in the sense that behaviour-specific beliefs relate to desirable outcomes and personal values, which, in turn, dictate the desirability of outcomes. In other words,

our values shape the way we form beliefs, while our beliefs form our values as well – the interaction is bi-directional and both beliefs and values have the potential to influence one another (Goodwin et al. 2012). However, we must stress that values do not change easily or chaotically. Value change needs to be addressed in a systematic manner, activating pro-environmental goals without activating conflicting values (Bardi et al. 2009; Maio et al. 2009).

Additionally, bearing in mind that all individuals possess all values to a certain extent (Schwartz 1992), it might be useful to regard values not only as predictors of behaviour per se but also as moderators for the functioning of beliefs as well. When one regards values as individual difference variables, one introduces a new layer of interaction in promoting Environmental Citizenship. Values have the potential to be changed in order to help people develop more favourable belief-forming strategies that would lead to increased Environmental Citizenship. There is therefore a great deal of potential and practical utility in looking at Environmental Citizenship through the context of the TPB while regarding personal values as individual difference variables that moderate the functioning of the TPB.

6.4.1 Future Directions and Practical Recommendations

Europe is a diverse region with many unique cultures. However, some values, beliefs and goals are shared among all European citizens, and promoting Environmental Citizenship is one of them. The common European goal of promoting Environmental Citizenship could, arguably, be best achieved through the understanding of the underlying diversity of various cultures. It is therefore understandable that promoting Environmental Citizenship in Europe should be context specific and tailored to the individual (Poškus 2017, 2018; Poškus and Žukauskienė 2017). Investigating values of different groups of individuals as well as values relevant to different cultures and regions (Katz-Gerro et al. 2017; Bardi and Goodwin 2011; Bardi et al. 2009; Inglehart and Baker 2000) would lend insight into how these regions could be best approached to promote Environmental Citizenship. While values are relatively stable if one's environment stays constant, they can be activated and shaped through changes in the environment (Bardi and Schwartz 2013; Bardi et al. 2009), especially through infrastructural solutions, such as paving bike lanes and providing readily available recycling bins. The most basic beliefs, on the other hand, are wholly dependent on the immediate environment and are readily changed when environmental influences reliably change. However, what is important to understand is the interaction between values and beliefs, since values, as individual difference variables, influence the way individuals form beliefs and, therefore, one cannot reach sustainable change if the values or beliefs are being addressed separately. In other words, sustainable change can be achieved by instilling an array of pro-environmental beliefs that would generalise the moral framework that makes up one's values. In addition, these values would need to be constantly reinforced through repeated examples of perceived desirable outcomes of acting upon one's beliefs.

A few steps need to be taken in order to holistically form the antecedents for Environmental Citizenship in Europe and beyond:

- A unified strategy of how the relevant policies would be put into practice needs to be developed in order to promote Environmental Citizenship through various societal driving factors (through media, education, communities and in the family).
- Educational and informational tools need to be developed and used in order to form factual and relevant beliefs about pro-environmental actions and to foster the development of values relating to Environmental Citizenship.

Perhaps the most efficient way to readily promote Environmental Citizenship here and now is through education. Citizenship education already is an integral part of the educational process, and various NGOs are already engaged in educating individuals to be more engaged in societal matters; thus, in many cases, formal and informal means for the education for Environmental Citizenship are already readily available. What might be lacking is a sense of direction and a unified methodology as well as a set of unified educational materials and shared goals. While many organisations engage in efforts that can be considered Education for Environmental Citizenship (ENEC 2018), these efforts, as they are now, are suboptimal because they do not work in unison with other areas of education. One of the key factors in effectively and robustly changing beliefs and forming values is consistency and multimodality of the stimuli used in this process (Bardi and Schwartz 2013; Bardi et al. 2009). In other words, the development of educational policies and curricula geared towards promoting Environmental Citizenship – actively transforming an individual's values and mindset – are needed in order to provide a whole-school approach towards the development of Environmental Citizenship at various stages of their personal development. As part of such curricula development, there is a pressing need to promote active social engagement programmes and incorporate service learning modules into the curriculum, all of which promote environmental literacy and environmental responsible behaviour.

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Chapter 7
Attitudes and Environmental Citizenship

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7.1 Discourses on Environmental Citizenship

Environmental Citizenship (EC) is usually defined as a citizenship driven by green ideas which result in environmentally friendly actions (see, e.g. Dobson and Bell 2006:23–24). Green political theory sees Environmental Citizenship as an important element in transition to sustainability (Barry 2002). In this context, an expanded view on citizenship is needed to achieve positive outcomes for the environment by way of personal lifestyle changes and/or citizen participation in environmental decision-making (Schild 2016), and some researchers see environmental education (EE) as a way to cultivate Environmental Citizenship.

The personal duty approach or lifestyle approach argues that each individual has the responsibility to take actions that protect the environment while also claiming rights to environmental goods (Schild 2016). Another approach claims that both individual and collective actions are needed to achieve Environmental Citizenship

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and recommends community building within local context and place-based education as a means towards cultivating Environmental Citizenship (Lubell 2002; Sverker and Matti 2010).

This means that the individual-level analysis of Environmental Citizenship has to be complemented by a more context-related view on the concept. In the following, we will define our key concept (environmental attitudes (EA)), analyse the relationship of environmental attitudes and values, present empirical research on environmental attitudes with special focus on measurement methods and finally summarise on how attitudes can develop.

7.2 Environmental Attitudes

A first definition of the concept of attitude was proposed by Allport in 1935 in the *Handbook of Social Psychology* (Murchinson 1935: 798–844). In his opinion, attitudes represent 'the predispositions learned to react with consistency to an object or class of objects in a favourable or unfavourable manner'. From this unanimously accepted definition, it is important to emphasise that attitudes are not instinctive but learned. Also, attitudes are predispositions for manifestations of a certain behaviour, and the answers are oriented positively or negatively and are also lasting or (according to newer research as) at least stable (van Harreveld and van der Pligt 2004; Betsch 2011). A general and common definition of attitude is from Breckler (1984). According to him, an attitude is a latent mental construct towards an abstract or concrete object and has three components: (1) the affective component indicating a person's feelings about the attitude object; (2) the behavioural or conative component describing the way the attitude influences a person's behaviour; and (3) the cognitive component, a person's belief/knowledge about an attitude object. Although some attitudes may arise partly from genetic sources, most attitudes are primarily learned (Baron and Byrne 1994), and attitudes formed through direct experiences are stronger than those formed from listening to or observing others (Fazio et al. 1982).

Other characteristics of attitudes that have been discussed in literature are the intensity (Eagly and Chaiken 1993), the centrality of the attitudes, the degree of differentiation (also called strength of the attitude) and the specificity of the attitudes.

- Intensity is the power of the affective component. The more an attitude approaches one of the extreme poles of a 'favourable–unfavourable' or 'positive–negative' bipolar scale, the greater its intensity.
- Centrality refers to the position of an attitude in the whole of the elements that characterise an individual: social belonging, values, aptitudes, etc.
- The degree of differentiation of beliefs is the number of beliefs that are present in the attitude. The lower the number of convictions, the more attitudes can be changed.

- Specificity or generality is the way in which an attitude towards an object or a whole category of objects is oriented. For example, we can develop a negative attitude towards a particular brand of soft drinks or all brands of soft drinks.

Milfont and Duckitt (2010) define environmental attitudes (EA) as a psychological tendency expressed by evaluating the natural environment with some degree of favour or disfavour. There are hundreds of EA measures available based on different conceptual and theoretical frameworks. The most popular ones are addressed later in this chapter.

A report on the development of civic attitudes across Europe found that there are two well-definable factors influencing students' civic outcomes: an open classroom climate and students' active classroom participation in democratic activities. Along with a personal and social background, civic and citizenship knowledge has influence on civic attitudes (Blaskó et al. 2018: 11–15).

7.3 Environmental Values

Research on the way people relate to the environment uses different concepts: 'value orientations', 'human–nature relationships' and 'visions of nature' are the words most often encountered in the literature focusing on the relation between humans and the environment. These concepts inform and influence more specific attitudes towards nature and/or the environment. Nevertheless, the concepts used in attitudinal research are not to be used synonymously with each other as they address different perspectives on the ways people relate to the environment. Some of these concepts are derived from theory, while others have an empirical basis or have been refined by large-scale surveys (Bauer 2016).

Civic attitudes are mainly discussed in the context of civic knowledge, attitudes towards democracy and equality, sense of identity, interest in public and political issues and in and out of school engagement. The International Civic and Citizenship Education Study collected data and gave an in-depth analysis of the factors influencing civic attitudes (see, e.g. Blaskó et al. 2018).

7.3.1 Values

Values can be defined as the criteria people use to justify actions and to evaluate people and events (Schwartz 2006). Values are more general than attitudes and are known to influence attitudes and actions in different domains. The theory of basic human values postulates that in all societies a distinction can be drawn between 10 basic values (power, achievement, hedonism, stimulation, self-direction, universalism, benevolence, tradition, conformity and security; Schwartz 1992). Within the basic human value of 'universalism', Schwartz and Boehnke (2004) identified the

subtypes ‘nature concern’ and ‘social concern’ (Bauer 2016). The subtype ‘nature concern’ can be described as including ideas concerning ‘unity with nature’, ‘protecting the environment’ and a ‘world of beauty’ and can be seen as a basic human value with different dimensions. In the empirical literature on protected areas, ‘human–nature relationship’ is used as a term for this value. The human–nature relationship, with its different dimensions (e.g. biocentric, ecocentric, biophobic), influences the more concrete attitudes.

7.3.2 Basic Environmental Value Orientations

There are some studies that address the relationship between the general public and nature, and many of these result in typologies of value orientations that differ in respect of types, focus (e.g. the feeling towards nature or the quality of the relationship) and content. Wilson (1993) defines two elementary value orientations that focus on the feelings of humans towards nature: biophilia, the love of all that lives and its antithesis and biophobia, the tendency for people to be afraid of nature.

Stern and Dietz (1994) define three basic environmental value sets that describe the relationship: the egoistic, the altruistic and the biospheric value orientations. And Thompson and Barton (1994) proposed an anthropocentric attitude type, an ecocentric attitude type and an environmentally apathetic type. Kaltenborn and Bjerke (2002) found that the anthropocentric value orientation correlated positively with a preference for farmlands, while the ecocentric orientation correlated with a preference for wild lands (Schultz et al. 2004; Swart and Van Der Windt 2005; Stenmark 2002).

In the empirical literature, ‘human–nature relationship’ is often used as a synonym for ‘nature concern’ or other environmental values (Bauer 2016). Especially relevant within our context is the typology of Kellert (1980, 1993). On the basis of a survey concerning attitudes towards wildlife, Kellert makes assumptions concerning the general human–nature relationship with nine dimensions: (1) the utilitarian dimension, (2) the naturalistic dimension, (3) the ecological scientific dimension, (4) the aesthetic dimension, (5) the symbolic dimension, (6) the humanistic dimension, (7) the moralistic dimension, (8) the dominating dimension and (9) the negative dimension.

In these dimensions, the concepts of biophilia and its converse, biophobia, are clearly apparent, although not all of Kellert’s dimensions can be assigned to the two concepts. The dimensions reflect the tendency to consider specific values as being especially relevant, and the human–nature relationship of a person can be described by more than one of the dimensions. Further exploration of human–nature relationship types (e.g. Flint et al. 2013) has led to an impressive variety of different typologies within the last 15 years.

7.4 Environmental Citizenship in Empirical Research

Environmental Citizenship has been conceptualised as part of pro-environmental behaviour (PEB) in some empirical studies: Larson, Stedman, Cooper, Decker (2015) examined the multidimensional structure of pro-environmental behaviour (PEB) and developed a 13-item PEB scale. Confirmatory factor analysis identified four key PEB domains: conservation lifestyle behaviours (e.g. household actions in the private sphere), social environmentalism (e.g. peer interactions and group membership), EC (e.g. civic engagement in the policy arena) and land stewardship (e.g. support for wildlife and habitat conservation).

Another topic that has generated interest is the civic engagement from non-activists and activists. Terms like Environmental Citizenship have been used to refer to pro-environmental actions in the sociopolitical arena, including actions such as signing petitions, writing letters, donating money to conservation causes or conscientiously voting to support pro-environmental causes (Cottrell 2003; Oreg and Katz-Gerro 2006; Schultz et al. 2004; Sia et al. 1986; Stern 2000). Social behaviours such as involvement in an environmental group or participation in a demonstration/protest related to environmental issues are also frequently associated with environmental activism (Fielding et al. 2008; Schultz et al. 2004; Stern et al. 1999). Less intensive forms of social interaction, including various forms of pro-environmental persuasion (Schultz et al. 2004; Sia et al. 1986) and, in some cases, simply talking to or educating others about environmental issues (Vaske and Kobrin 2001; Kaiser 1998) can also be found in literature. Collectively, through their influence on formal policy and decision-making and informal social norms, these actions may have a powerful influence on the trajectory of human–environment interactions. Effective measures of PEB should therefore account for these various forms of civic engagement (Larson et al. 2015).

7.5 Research on Link Between Environmental Values, Attitudes and Behaviour

There is usually a weak correlation between attitudes and behaviour (also true for environmental attitudes, see Kormos and Gifford 2014), but specific attitudes are known to be much better predictors of behaviour than general ones. In contrast to these findings, recent research shows a strong connection between individuals' relationship with nature and their environmental behaviour (EB) and decision-making (Braito et al. 2017; Muhar et al. 2017). Similarly, van der Werff, Steg and Keizer (2013) analysed the biospheric values and environmental self-identities that are considered to be important antecedents of environmental preferences, intentions and behaviour. Results show that biospheric values are related to environmental self-identity, even when measured months before. Moreover, the results indicated that biospheric values are related to preferences, intentions and behaviour via one's

environmental self-identity. This suggests that values need to be linked to the self in order to be influential in choices made. Similarly, research by Martin and Czellar (2017) proposed that individual environmental identity could play a role in the formation of a biospheric value orientation. Their findings showed that stronger (vs. weaker) self-nature connections in individuals are related to stronger (vs. weaker) biospheric value orientations, which in turn are associated with various forms of sustainable behaviour.

Schild (2018) analysed the motivations and outcomes of civic recreation – recreation-based volunteering on the human–nature relationship. She found six dimensions of volunteer motivation: civic engagement, environmental values, identity/enduring involvement, social/career networking, personal learning and obligation. Individuals were most motivated by civic engagement and environmental values, and those individuals who were motivated by identity/enduring involvement were more likely to have a higher level of volunteer engagement, whereas individuals motivated out of obligation had the lowest volunteer engagement. The results suggest civic recreation has the potential to create advocates for the environment, Environmental Citizens, as the individuals report developing a stronger connection to nature, enhanced self-efficacy, self-enhancement, social connections, improved management and increased civic engagement.

In research on children's EA and environmental behaviour (EB), Evans et al. (2007) did not find a significant relationship between EA and EB in children aged 6–8 years from the United States, Austria, Mexico and Spain, when using a reliable instrument developed to assess these constructs in young children. Difficulties in assessing environmental behaviours were hypothesised to explain the non-significant EB findings, and the authors suggest that a stronger link between EA and EB might be found in more mature children.

On the other hand, many other studies support the predictive role of EA when explaining EB (e.g. Collado and Corraliza 2015; Cheng and Monroe 2012; Grønhøj and Thøgersen 2017). These studies report that other factors such as 'fascination' (Kaplan 1995), knowledge of the environment or perceived self-efficacy/locus of control (Cheng and Monroe 2012; Blackwell, undated) play a role when predicting EB through EA. In the study of Cheng and Monroe (2012), children's previous experience in nature had a direct and indirect positive effect on their EB through EA. Other variables to consider seem to be frequency of contact with nature (FCN) (Hinds and Sparks 2008; Thompson et al. 2008; Wells and Lekies 2006), the type of daily experience in nature (Gifford and Nilsson 2014) and parents' values towards nature (Cheng and Monroe 2012; Grønhøj and Thøgersen 2017; Evans et al. 2018) as well as gender differences (Corraliza et al. 2013).

7.6 Measuring Environmental Attitudes

Although there is a large number of different EA measures, the one that is most used is the New Environmental Paradigm (NEP) Scale (Dunlap and Van Liere 1978; Dunlap et al. 2000). It examines multiple expressions of concern, such as beliefs, attitudes, intentions and behaviours and also examines concerns about various environmental topics, such as pollution and natural resources. The NEP Scale is used to measure general beliefs about the relationship of human beings to the environment. The universal nature of the beliefs measured by the NEP Scale may explain why it has become the most widely used measure of EA since its publication in 1978 (Dunlap and Jones 2002, 2003; Stern et al. 1995).

The development of the NEP Scale was the authors' recognition that it was possible to identify an emerging ecocentric system of beliefs (i.e. humans are seen as being part of natural systems and constrained by that fact) that challenged the dominant anthropocentric system of beliefs current in Western societies (i.e. humans are seen as being independent from, and superior to, other organisms in nature) (see also Sect. 7.2 above). These two systems were, respectively, named the New Environmental Paradigm (NEP) and the Dominant Social Paradigm (DSP). It is worth noting that the NEP and DSP are theoretically related to Schwartz's (1999) harmony–mastery cultural value dimension. This issue leaves societies with two solutions in order to regulate human activity: either to fit harmoniously into the world and try to preserve it (harmony values or the NEP worldview) or to exploit and change the world (mastery values or the DSP worldview). There are several different versions of the NEP Scale. The revised NEP Scale is currently the most used scale for assessing EA and consists of 15 items.

Milfont and Duckitt (2010) developed the Environmental Attitudes Inventory (EAI) in which the multidimensional and hierarchical nature of EA is considered. The EAI has 12 specific scales that capture the main facets measured by previous research. The 12 factors were established through confirmatory factor analyses, and the EAI scales are shown to be unidimensional scales with high internal consistency, homogeneity and high test–retest reliability and also to be largely free from social desirability.

Bogner prepared the two-factor Model of Environmental Values (2-MEV) using the data of a survey conducted among German secondary school pupils (Bogner and Wiseman 2006: 247). The model, developed in earlier papers, is based on two independent factors: utilisation (anthropocentric view) and preservation (biocentric view). They argue that their scale may help to measure the outcomes of EE (Bogner and Wiseman 2006: 253).

7.7 How Do Environmental Attitudes Develop? What Are the Factors Influencing EA?

There are many studies analysing the formation of EA. Some of the studies focus on children, and some are retrospective and focus on adults asking them about their nature contact during childhood.

7.7.1 Studies Focusing on Children

Collado et al. (2013) reported on a study in Spain comparing two types of nature camps, one with EE and one without EE, and their influence on emotional affinity towards nature (EAN), ecological beliefs and willingness to show ecological behaviour including Environmental Citizenship behaviour. The study found no differences between nature camps with and without EE but a difference between camps in a natural environment and in an urban environment: the intention for Environmental Citizenship behaviour increased in those children at the nature camp compared to those at the urban camp. This increase was mediated by the increases in EAN and in ecological beliefs. In the United Kingdom, Turtle, Convery and Convery (2015) compared the EA of children aged 8–11 years who participated in forest school programmes and those who did not. The results indicate that those taking part in the programme had more pronounced EA (see also Kamber 1999).

Another set of studies is looking at different living conditions or long-lasting interventions (e.g. long-term forest school programmes, green vs. grey schoolyard, rural vs. urban surroundings). Collado et al. (2014) analysed the association between FCN and EA and EB in three different settings providing different daily experiences of nature: (a) work-related experience in a rural area, (b) non-work-related experience in a rural area and (c) non-work-related experience in an urban area. The study found a negative direct relation between FCN and EB for the work-related experiences in the rural area. The results suggest that the valuation of the experience might be relevant for the effect on pro-environmental attitudes and behaviour. Similar results were reported by other authors, suggesting that unsatisfactory experiences could have a negative impact on the formation of EB (e.g. Wells and Lekies 2006) (see also Collado and Corraliza (2015).

In their study with approximately 1500 children in the fourth grade of public schools in Florida, USA, Cheng and Monroe (2012) found that the children's previous experiences in nature influenced their interest in performing EB. Other factors contributing to the EB were the family values towards nature and the perceived control of the children/their feeling of self-efficacy. Additionally, the results of the study found a significant correlation between children's connection to nature and the amount of nature near their homes, leading to hypothesise that nearby nature could help develop a strong relation to the environment. Similarly, Davis et al.

(2006) found that time spent outdoors was associated with the development of positive values about nature (see also Evans et al. 2018).

7.7.2 Retrospective Studies

We analysed studies focused on adults that asked them about their nature contact during childhood. Wells and Lekies (2006) surveyed 2000 adults aged 18–90 years in the United States and asked them about their experiences in nature before the age of 11. Activities in wild nature (e.g. hunting, camping) and in domestic nature (e.g. gardening) were related to EA and EB. The more nature experiences people reported, the more likely it was that they had a positive attitude towards nature and the environment, which could further influence pro-environmental behaviour. Interestingly, the study revealed that frequency of exposure to nature had both a direct effect on EB and an indirect one, mediated by EA.

The findings of retrospective studies lead to the hypothesis that significant life experiences during childhood could be relevant for adults' career decisions. In review articles and studies with environmentalists in Norway and the United States (Chawla 1999, 2007), the role of the time spent outdoors, the positive experiences in natural environments, the family values and role models (e.g. family members) were all found to be important for the career choices. Attari et al. (2009) analysed three different methods of reaching energy-related behaviour: (1) voluntary actions vs. regulations, (2) the reason for the restrictions: environmental or national security and (3) sociodemographic characteristics. They conducted a non-representative survey among US citizens about what tools would encourage them to change from a SUV to a smaller car and asked them to reason their choice.

Their results show that participants preferred either voluntary actions or soft regulations over hard regulations to reach the more environmentally friendly behaviour but had no significant preference between voluntary actions and soft regulations. It also turned out that the framing of the problems had no significant effect on the participants' openness towards voluntary actions or regulations. Environmental attitudes (measured by the NEP Scale) had a strong positive relationship with support for regulatory strategies intended to change the behaviours in question. They also found a gender effect as women were more likely to support voluntary actions. The loss of personal freedom was frequently mentioned as a reason for saying no to hard regulations (Attari et al. 2009:1).

7.8 How Can Attitudes Be Changed?

Quite a lot of research analysed what influences behavioural change, as we have shown above. Some authors, for example, Dobson (2007), argue that long-lasting behavioural change can be reached by attitude change, but the core of it would be

'environmental or ecological citizenship' (Dobson 2007: 297). According to the referred paper, Environmental Citizenship and EA both have a long-term effect on pro-environmental behaviour. There are many partly contradicting research results on different ways to influence environmental attitudes.

Information campaigns often used by environmental NGOs could be used to strengthen positive attitudes of those in favour of environmental protection. However, from former research, we know that information campaigns would be inappropriate for influencing the attitudes of people opposed to nature protection/environmental actions, etc. (Petty and Cacioppo 1986). The attitudes of those having a negative attitude could be best changed to be more accepting by using role models (well-known politicians, actors) who communicate their dedication to environmental protection.

Other research found that individual differences in values moderated the persuasive power of the different appeals and that appeals that matched the recipients' values were more persuasive than the combined appeal (Van den Broek et al. 2017). These findings also suggest that environmental campaigns aimed to induce behavioural change could benefit from tailoring persuasive messages rather than employing a one-size-fits-all message.

The research of Steg et al. (2014) showed that hedonic, egoistic, altruistic and biospheric values can be distinguished empirically and that hedonic values appeared to be significantly and negatively related to a range of environmentally relevant attitudes, preferences and behaviours. This suggests that it is indeed important to include hedonic values in environmental studies and that interventions aimed to promote pro-environmental actions should consider hedonic consequences of actions, as these may be important barriers for behaviour change.

In Klöckner's (2013) comprehensive model of determinants of individual environmentally relevant behaviour, the intentions to act, the perceived behavioural control and habits were identified as direct predictors of behaviour. Intentions are predicted by attitudes, personal and social norms and perceived behavioural control. Based on the model, interventions to change behaviour need to not only include attitude campaigns but also focus on de-habitualising behaviour, strengthening the social support and increasing self-efficacy by concrete information on how to act. Value-based interventions have only an indirect effect.

In a qualitative study, Fischer et al. (2012) analysed how attitudes, climate change perception and energy use are interrelated and found that people tend to hope that technological change will solve environmental problems, so there is no need for a change in the own energy-related behaviour. However, Manfredo et al. (2017) argue that values are not only motivational goals people hold but are also ideas that are deeply embedded in society's material culture, collective behaviours, traditions and institutions that define groups, organisations and societies and are typically stable across generations. The authors argue that value shifts for conservation are unlikely to be effective and propose that innovative conservation strategies for working within existing value structures would be more valuable.

Social influence has a medium impact on environmental behaviour according to Abrahamse and Steg (2013), who conducted a meta-analysis of several researches: the heterogeneity of the results was the effect of three groups of factors. The first type of factors was the character of social influence: block leader effect, public commitment, group feedback, comparative feedback and the use of social norms. In the second type of research, the target group changed: whether they were students, employees, households, farmers or guests of a hotel. In the third type, the analysed behaviour varied (the effect of environment of the analysed behaviour). According to them, this latter case had no significant effect of social influence on the environmental behaviour.

There is not much research on how Environmental Citizenship can be promoted; most of the papers argue that formal and non-formal education may have such a role (Dobson 2007: 283; Blaskó et al. 2018). Further research shall explore how Environmental Citizenship can be made more widespread among adults.

7.9 Concluding Remarks

In this chapter, we reviewed the most important literature on environmental attitude and analysed the relationship between environmental behaviour, environmental values and environmental attitudes. We also discussed how environmental attitudes can be changed and how they affect environmental behaviour. We found that while in general there is often a weak relationship between attitudes and behaviour, in the case of environmental attitudes and behaviour, there is a significant relationship according to the reviewed papers. Analysing the factors influencing the change of environmental attitudes and behaviour, the literature argued that experiences from childhood and early life periods and social influence and voluntary actions have a strong effect. Earlier researches also argued that the perception of environmental problems or climate change does not necessarily affect pro-environmental behaviour in a positive manner. Most of the reviewed research on factors influencing environmental attitudes and behaviour does not measure the long-term effects, especially, whether attitudes, values and behaviours changed on the longer term. Thus, future research shall focus also on the long-term effects of the different factors and also on the interrelatedness of the different influencing factors.

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Part III
Environmental Citizenship in the Context of Environmental Education and Education for Sustainability

Chapter 8
Education for Environmental Citizenship and Responsible Environmental Behaviour

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8.1 Introduction

Young people are growing up in a world of overwhelming environmental challenges resulting from the declining state of the environment, which is intensifying economic and social problems (Pe'er et al. 2013). These environmental issues are systemic – they are interrelated and interdependent and straddle the natural and social realms. Such a world requires a citizenry that can comprehend the complexity of environmen-

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tal issues, is committed to the idea of environmental-social sustainability and actively participates in actions in the direction of solving current problems and preventing the creation of new ones. The concept of Environmental Citizenship embodies behaviour – an actively involved citizen who exercises their environmental rights and obligations in both the private and public spheres. Accordingly, Education for Environmental Citizenship implies behavioural change. The goal of Education for Environmental Citizenship is to facilitate the commitment towards and the capacity for active participation in environmentally responsible actions; it is about cultivating the cognitive (e.g. knowledge and understanding, skills and competences) and affective (e.g. values, beliefs, attitudes/emotions, assumption of responsibility, sense of ability) components that both motivate and enable the translation of knowledge into effective action as citizens. This chapter is based on the assumption that Education for Environmental Citizenship is not coercive or indoctrinating – it is not about imposing 'correct' behaviours but rather about facilitating the individual's intellectual growth and emotional capacity that may lead to a critical and actively engaged individual.

Human behaviour is extremely sophisticated – what shapes pro-environmental behaviour is complex and context specific. Additionally, empirical research indicates a discrepancy between having environmental knowledge and environmentally supportive attitudes and behaving pro-environmentally (e.g. Heimlich and Ardoin 2012; Hungerford and Volk 1990; Hines et al. 1987). It is, therefore, not surprising that identifying the numerous internal (and external) factors that influence a person's decision towards a course of action and elucidating how these interplay is the focus of extensive but inconclusive study. The point of departure of this chapter is that social and psychological study of behaviour has much to inform the study of environmental behaviour and, deriving from this, to inform regarding the type of education that educates towards behaviour/action in the goal of social transformation. This chapter focuses on internal factors (i.e. psychosocial, personality) rather than external ones (i.e. situational, contextual) that influence behaviour. Within this framing, the chapter presents selected models regarding factors influencing behavioural decisions that have been acknowledged as influential frameworks for investigating pro-environmental behaviour and selected contemporary theories that may inform behavioural models.

As a basis for the behavioural models, this chapter opens with a brief mapping of types of pro-environmental behaviour in the context of Environmental Citizenship. The main body of the chapter reviews the behavioural models. It concludes with a brief discussion of the implications of the presented models for educational practice from the perspective of Education for Environmental Citizenship.

8.2 Pro-environmental Behaviour in the Context of Environmental Citizenship

Growing complexity and interconnection between and within societies have become inherent characteristics of the modern world. Outreach to citizens is related to the concept of 'community', which embraces the local, regional, national and

international contexts that individuals live in to create a common public space, within which individuals can act together on a value- and knowledge-based foundation.

Citizenship actions, in general, are acknowledged in the public and private spheres that affect relations between individuals (private spheres) and societies (public spheres). Dirk Postma states that 'the private sphere is celebrated as the primary space where people are presumed to find ultimate life fulfilment by living according to their own device, taste, religion, or view on life in the pursuit of happiness' (Postma 2006, p. 24). Citizenship, as a concept, is about the rights and duties of individuals in a given political territory such as the state (Dobson 2005). It is a widely addressed but debated concept, and Environmental Citizenship contributes to ongoing debates in important ways (MacGregor et al. 2005). The citizenship theoretician Dobson (2010, p. 6) defines Environmental Citizenship as 'pro-environmental behaviour, in public and private, driven by a belief in fairness of the distribution of environmental goods, in participation, and in the co-creation of sustainability policy'. In a narrow sense, environmental behaviour is behaviour that impacts the environment and is, most straightforwardly, understood in terms of environmental science or ecology according to its impact on the environment. This is to the extent where it impacts the availability of resources (material or energy) from the environment or changes the structure or dynamics of ecosystems or the biosphere (Krajhanzl 2010; Stern 2000). As people are in an interaction with their environment almost constantly, almost all human behaviour could be considered environmental behaviour, whether the influence is direct (e.g. cutting down a forest, using public transportation instead of private car or riding a bicycle instead of going by vehicle) or indirect, by influencing the context in which decision-making is conducted (e.g. voting for a public elective who advocates environmental policy, writing a letter to a public servant or government institution). Given that the goal of sustainability is to achieve a long-term reduction in overall negative environmental impact, it follows that for a behaviour to be pro-environmental it needs to promote the attainment of this goal. In order to understand how individual behaviour matters for the transition to sustainability, it is necessary to comprehensively explain how individuals may impact the environment, rather than limit the focus to consumption decisions and related impacts.

Stern (2000) identifies several distinct types of environmentally significant behaviours and claims that a different combination of causes determines the different types. Figure 8.1 shows Stern's categories of environmentally significant behaviours.

According to Stern's typology, environmental activism behaviours include active involvement in environmental organisations, demonstrations and campaigns, participation in pro-environmental social movements and leading environmental initiatives. Activism is therefore affiliated with the public sphere. Non-activist behaviours in the public sphere include actions that support public policies (e.g. explicit support of environmental regulations, willingness to pay higher taxes, fees or contributions aimed towards environmental protection, voting). Such behaviours influence the environment indirectly, but the effect may be significant since public policies can change the behaviour of both individuals and organisations. The private

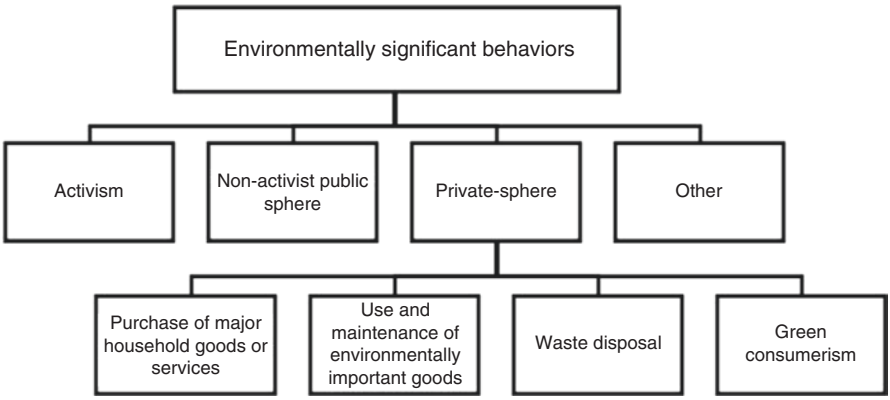


Fig. 8.1 Stern's classification of environmentally significant behaviour. (Based on Stern 2000)

sphere relates to personal lifestyles; it is concerned with our everyday behaviours in our household and personal lives that have direct environmental consequences (i.e. purchasing choices, use of material and energy resources at home, services, what we do with household waste, transportation, recreation). Stern (2000) proposed the subdivision of private-sphere behaviours into four subtypes based upon the type of decision involved: the purchase of major household goods or services, the use and maintenance of environmentally important goods, waste disposal and green consumerism. Individuals may also impact the environment by influencing the actions of the organisations to which they belong. Stern groups these behaviours as 'other' since the causal factors that influence the individual's behaviour in this context may be different from those influencing their private-sphere or political behaviours. In the context of young people, this category may address school, youth movements, sports groups, etc.

Some additional classifications of environmental behaviour are worth mentioning. For example, Thøgersen (1999) identifies three categories: civic activities, consumer purchase decisions and post purchase behaviour. Alternatively, Clayton and Myers (2009) classify three broad behavioural categories: curtailment, behaviour choices and technology choices. These behaviours share some overlap with the above-mentioned categories. Each of these behaviours can be targeted for conservational efforts. Other researchers use a simple dichotomous classification scheme (Inskeep and Attari 2014; Karlin et al. 2012; Barr et al. 2005). This is exemplified in relation to energy conservation behaviour as follows: household energy-saving or curtailment actions (e.g. setting thermostat, running dishwasher only when full) as opposed to purchase-related behaviour (Barr et al. 2005; Gardner and Stern 2008). Understanding the similarities and distinctions between behaviours and what variables predict those behaviours is a necessary step for the development of effective intervention strategies that aim to reduce energy use (Karlin et al. 2012).

To support and illustrate the theoretical discussion concerning responsible environmental behaviour (REB), we also draw on empirical measurements of private

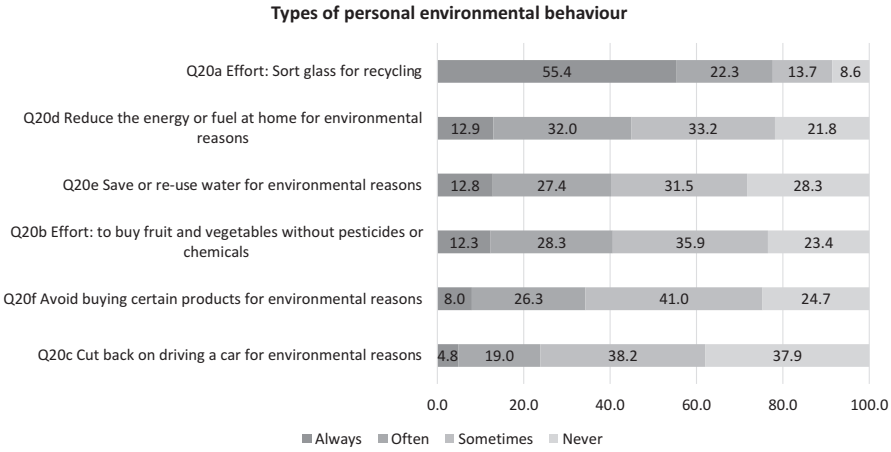


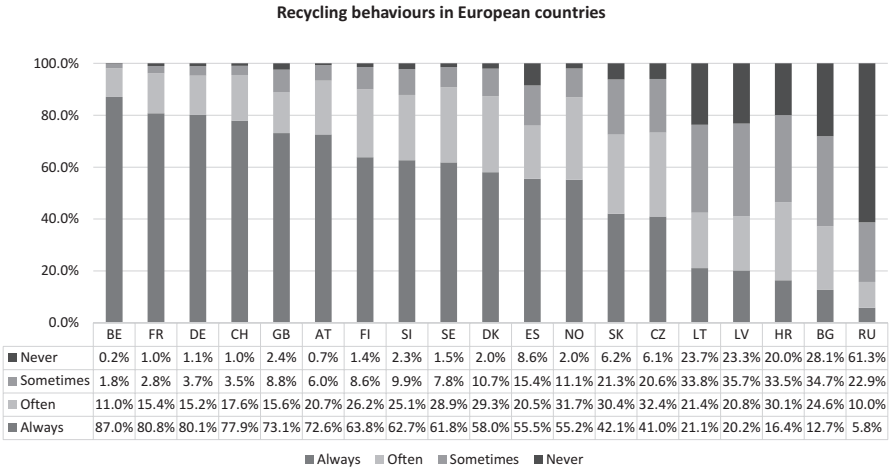
Fig. 8.2 The general distribution of personal environmental behaviour in Europe (%), ISSP Environment III, 2010, $N = 25{,}125$. (Data: ISSP Research Group 2012)

and public-sphere personal environmental behaviours. Figure 8.2 shows the general distribution of levels of diverse personal sphere environmentally significant behaviours in Europe. Data is from the International Social Survey Programme module on environment (ISSP Research Group 2012) in which personal environmental behaviours were operationally defined as sorting glass for recycling, saving or re-using water, reducing energy or fuel at home, buying fruits and vegetables without pesticides or chemicals, avoiding the purchase of certain products and cutting back on driving a car for environmental reasons. Not surprisingly, support for recycling is the environmentally supportive behaviour conducted most frequently, as found in many studies (e.g. Goldman et al. 2018).

Country-level distribution is also relevant. ISSP Research Group (2012) data presented in Fig. 8.3 show the average answers about recycling behaviour across different countries in Europe.

The data showcases the country differences, underscoring the need for diversity in educational programme design.

Figure 8.4 presents the levels of actual environmental activism (public-sphere environmental behaviour) across European countries. Environmental activism is operationalised here as environmental NGO or group membership, protesting or going to a demonstration. Levels of environmental activism are contrasted against priorities given by citizens either to the environment or to the economy (a traditional worldview divide) as being the most important issue. In many countries, significantly less priority is given to environmental considerations as compared to economic. Norway and Switzerland stand out in the higher priority their citizens give to the environment, as well as Sweden and Austria, whose public perceives similar importance of environment and economy. Data also show the apparent differences among European countries in terms of levels of environmental activism. Petrova



	BE	FR	DE	CH	GB	AT	FI	SI	SE	DK	ES	NO	SK	CZ	LT	LV	HR	BG	RU
Never	0.2%	1.0%	1.1%	1.0%	2.4%	0.7%	1.4%	2.3%	1.5%	2.0%	8.6%	2.0%	6.2%	6.1%	23.7%	23.3%	20.0%	28.1%	61.3%
Sometimes	1.8%	2.8%	3.7%	3.5%	8.8%	6.0%	8.6%	9.9%	7.8%	10.7%	15.4%	11.1%	21.3%	20.6%	33.8%	35.7%	33.5%	34.7%	22.9%
Often	11.0%	15.4%	15.2%	17.6%	15.6%	20.7%	26.2%	25.1%	28.9%	29.3%	20.5%	31.7%	30.4%	32.4%	21.4%	20.8%	30.1%	24.6%	10.0%
Always	87.0%	80.8%	80.1%	77.9%	73.1%	72.6%	63.8%	62.7%	61.8%	58.0%	55.5%	55.2%	42.1%	41.0%	21.1%	20.2%	16.4%	12.7%	5.8%

Fig. 8.3 The country-level distribution of recycling behaviour (sorting glass for recycling) in European countries (%), ISSP Environment III, 2010. (Data: ISSP Research Group 2012)

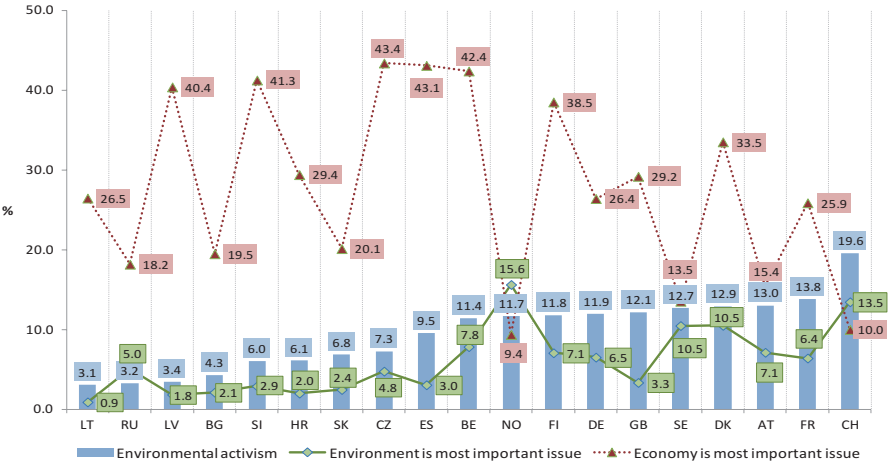


Fig. 8.4 The country-level distribution, in European countries, of environmental activism compared with data indicating environment and economy as the most important issue for their country (%), ISSP Environment III, 2010, $N = 25{,}124$. (Source: Telešienė and Balžekienė 2016: 168; data: ISSP Research Group 2012)

and Tarrow (2007) have interesting insights concerning these differences. They found that the level of an individual citizen's capacity for collective action is very low in Central and Eastern European (CEE) countries. They identified several features of the societies in these countries that lead to extremely low levels of civic participation: 'weakening, demobilization, and even the disintegration of civil

society; the increasing political apathy of post-socialist citizens; and radical or egoistic individualism, social anomie, amoral cynicism, paternalism' (Petrova and Tarrow 2007, p.76). Thus, while drafting educational programmes in CEE countries, these sociopolitical contexts should be taken into consideration.

An interesting study is the Flash Eurobarometer survey of 'Attitudes of Europeans towards building the single market for green products' (Flash Eurobarometer 367 2013). This report focuses on the attitudes of EU citizens to sustainable development (SD) in six sections, of which the first examines citizens' behaviours and attitudes towards environmentally friendly products and the second looks at the influence of environmental considerations on their consumption habits. The results indicate that across the EU, a very high proportion of citizens (80%) buy environmentally friendly products; about a quarter of them (26%) purchase these regularly and about half of them (54%) purchase these occasionally. Twenty percent of EU citizens do not buy environmentally friendly products. Europeans support taking a variety of actions for environmental reasons, and they are increasingly changing their behaviour for environmental reasons.

Policies that seek to promote pro-environmental behavioural change will need to engage with the social context that shapes and constrains social action as much as it addresses mechanisms of individual choice (Jackson 2005). Kollmuss and Agyeman (2002) suggest that factors important in pro-environmental (green behaviour) fall under three headings: demographics, external and internal. External factors include infrastructure, economic, social and cultural factors. Internal factors include variables in the cognitive and affective domains such as environmental knowledge, motivation, values, attitudes, environmental awareness and perception of control. Attempting to understand the relationships among these and how they impact peoples' behavioural decisions is the focus of extensive social-psychological research and is addressed in the following section (see Sect. 8.3).

8.3 Behaviour Models

Many different models of environmental behaviour can be found in the theoretical and empirical literature. They consider a broad range of aspects of the person whose behaviour is under consideration (i.e. internal, also termed personality or psychosocial factors) and the situation in which they are acting (i.e. external, also termed contextual factors or situational factors). This section presents several theories (i.e. models) of behaviour. While it does not attempt to be a conclusive review of theories relevant to environmental behaviour (which is beyond the scope of this chapter), it is organised in a manner that attempts to reflect development in the research and understanding of factors that influence our behaviour and should inform the development of educational interventions. While any attempt for categorisation of the existing models is at risk of oversimplification, three groups of models may be identified according to the factors they highlight.

8.3.1 Knowledge-Based Models

Early thinking regarding environmental education took a linear approach to environmental behaviour with a focus on knowledge and awareness. The assumption was that providing knowledge (information) will invariably lead to more environmental awareness and a positive attitude towards the environment, which, in turn, will lead individuals to behave in a more environmentally responsible manner. This approach, known as the K-A-B (knowledge-attitude-behaviour) model, also informed much of the campaigning and communication strategies. However, the widely reported knowledge-attitude-behaviour gap found in much environmental behaviour research indicates the insufficiency of reliance on solely information-driven behavioural change.

The debated role of knowledge in promoting pro-environmental behaviour has increased attention to the knowledge domain. For example, Kaiser and Fuhrer (2003) identify different forms of knowledge and claim that these must work together to promote ecological behaviour. According to their typology, declarative environmental knowledge refers to factual knowledge (i.e. how environmental systems work), and procedural knowledge refers to action-related knowledge (i.e. the know-how to achieving environmental protection goals such as different courses of action and how to participate). Effectiveness knowledge is related to the individual's cost-benefit ratio (i.e. the ability to rationally assess the worthwhileness of the personal trade-off, such as effort and financial) and relates to the environmental effectiveness of the alternative behaviours. In addition to these forms of knowledge, they acknowledge the role of social knowledge, i.e. social norms. Some of these knowledge types are understood by other researchers not as knowledge but rather as other components that make up the individual's environmental literacy. For example, procedural knowledge is equivalent to the skills element of environmental literacy: the higher-order cognitive skills for critically assessing alternative courses of action and the sociopolitical skills required for citizen participation (Alkaher and Goldman 2017; Hollweg et al. 2011). The parallels of social knowledge are addressed in Sect. 8.3.2.

Knowledge-based models have been furthered by asking questions about the origins and development of knowledge, perceptions and attitudes. Experiential Processing Theory argues that experientially derived knowledge has more impact on behaviour than abstract knowledge (Epstein 1994). Leiserowitz's study into climate change perceptions and behaviour (2006, p. 45) has shown that 'American risk perceptions and policy support are strongly influenced by experiential factors, including affect, imagery, and values'. Experiential Processing Theory argues that people's behavioural choices are not only rational, based on analytic cost-benefit (and risk) or likelihood calculations, but also are driven by affect and emotions (Leiserowitz 2006). Behaviours might be driven by misconceptions or selective framing that from the individual's perspective might be perfectly rational, even though incompatible with scientific knowledge (e.g. as taught at schools). Thus, Leiserowitz (2006) argues that knowledge and attitudes that drive behaviours are significantly influenced by (1) affect, what positive and negative feelings does an

individual have towards a valued object, e.g. environment, and (2) imagery, what are the visual and mental representations related to environment, what is the mental model that accommodates those visual representations of a valued object, e.g. environment. It is important to stress the value of experiential processing instead of focusing solely on rational analytic models or abstract learning in classrooms. The impact of direct experience does not always work towards fostering pro-environmental behaviours. For example, Whitmarsh claims that her research conducted in the south of England 'indicate flood victims differ very little from other participants in their understanding of and responses to climate change, but that experience of air pollution does significantly affect perceptions of and behavioural responses to climate change (Whitmarsh 2008, p. 351)'. Thus, Education for Environmental Citizenship should also examine the preexisting mental models and work with cases that have the highest direct influence; meaning that they raise affect, provide with images and are easily implanted into the already existing mental models of school children.

8.3.2 Attitude-, Value- and Norm-Oriented Models

The role of knowledge is considered to be important but not as the only crucial factor. Several models highlight the role of the affective domain, and a significant body of theoretical and empirical literature in social psychology addresses the role of values in human behaviour. Three fundamental types of value orientation are identified: egoistic values (self-interest; environmental concern stems from the impact of the environment on one's self, self-oriented goals and people important to the individual), social/human altruism (the scope of concern is humanity) and biospheric/ecocentric altruism (the scope of moral consideration is towards other species and the state of ecosystems, i.e. nature's well-being) (de Groot and Steg 2008; Schultz 2001). Egoistic values and human altruism reflect an anthropocentric ethic, while in a biospheric value orientation, moral consideration of nature is independent of services it provides for humans – an ecocentric orientation.

One of the most applied models of environmental behaviour in social psychology is the Theory of Planned Behaviour (TPB) by Ajzen (1991). The underlying assumption is that people behave rationally; decision-making is guided by rational evaluation of perceived positive and negative consequences. According to the TPB theory, the intention (i.e. plan) to act in a certain way is the strongest predictor of actual behaviour, and this intention is in turn determined by attitudes towards the behaviour, subjectively perceived norms that the actor perceives in their social environment and the perceived behavioural control of the actor (Fig. 8.5). Thus, attitudes do not determine behaviour directly but indirectly through behavioural intention. Behavioural intentions are shaped not only by attitudes but also by social norms. Within this theory, attitudes can be understood as positive or negative evaluations of the behaviour and its consequences based on personal outcome beliefs and outcome evaluations. Subjective norms capture the expectations of important others

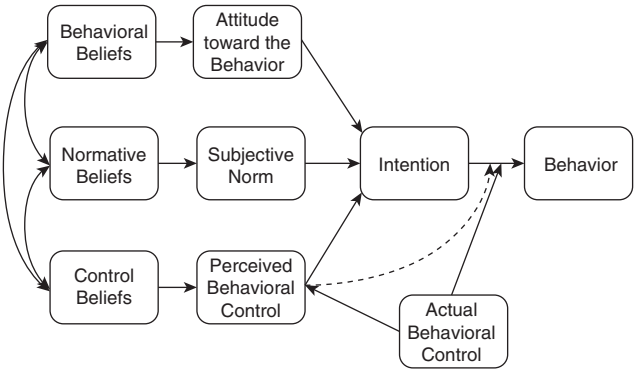


Fig. 8.5 Schematic description of main elements of the Theory of Planned Behaviour (TPB)

(i.e. what they consider preferable/non-preferable behaviour) and how much the acting person is willing to comply with these expectations. Thus, the primary determinants of behaviour are behavioural beliefs regarding consequences of the behaviour and normative beliefs regarding how other people view the behaviour (Fig. 8.5).

An additional factor, the perceived behavioural control component, acknowledges that the performance of most behaviours '…depends at least to some degree on such non-motivational factors as availability of requisite opportunities and resources (e.g. time, money, skills, cooperation of others […]). Collectively, these factors represent people's actual control over the behaviour. To the extent that a person has the required opportunities and resources, and intends to perform the behaviour, he or she should succeed in doing so' (Ajzen 1991 p.182). Thus, the TPB acknowledges the importance of situational constraints.

Ajzen (1991) considers the influence of actual behavioural control on behaviour as self-evident, but for him, 'Of greater psychological interest than actual control, however, is the perception of behavioural control and its impact on intentions and actions' (p. 183). In other words, perceived behavioural control refers to an individual's perceptions of the ease/difficulty in performing the specific behaviour. This means that in principle, the TPB is open for the inclusion of objectively existing restrictions and options in addition to perceived ones when formulating predictive models.

An early model applied to explain environmentally friendly behaviour was the Norm-Activation Model (NAM) by Schwartz (1977). The model was originally developed to explain altruistic, helpful behaviour. The basic assumption of the NAM is that moral or personal norms are direct determinants of prosocial behaviour. However, since altruistic behaviour is one that benefits others, the model could be easily transferred to positive environmental behaviours that protect and benefit the environment and therefore others. The model assumes that social norms requiring people to help others in protecting the environment are conveyed to individuals via processes of education and communication and thus become personal norms. If persons have internalised personal norms of positive environmental behaviour

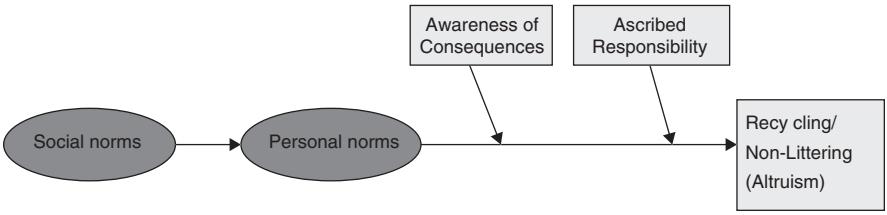


Fig. 8.6 Schematic description of main elements of the Norm-Activation Model (NAM) of altruistic behaviour by Schwartz (1977)

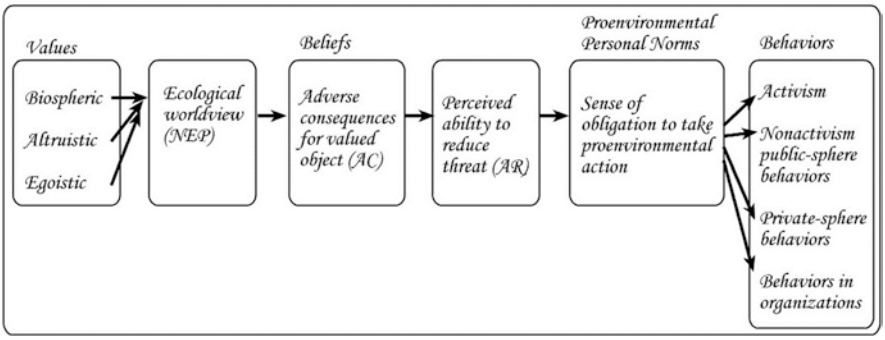


Fig. 8.7 Schematic description of main elements of the Value-Belief-Norm (VBN) model by Stern et al. (1999). (Adapted by Goldman et al. 2014 from Stern et al. 1999, with kind permission of the authors)

and are aware of the consequences of their actions and assume responsibility for their actions and resulting consequences, people will act in an environmentally friendly way, e.g. by recycling, correct waste disposal, using a bicycle, using public transport or choosing not to fly (Fig. 8.6).

Stern et al. (1999) developed the Value-Belief-Norm (VBN) theory of environmental behaviour.[1] The model can be regarded as a modification and further development of the Schwartz (Norm-Activation Model of 1977) as it views altruistic, environmental and egoistic value orientations as predictors of ecologically oriented personal norms, which are enacted if the actor is aware of the consequences of their own actions and assumes responsibility for their actions. The VBN theory (Fig. 8.7) links the New Environmental Paradigm (NEP) worldview (Dunlap and Van-Liere 1978) along with value theory and the norm-activation theory into a causal chain of

[1] The VBN theory of environmental behaviour distinguishes among three types of behaviours: (a) private-sphere (pro-)environmental behaviour, (b) individual organisational (pro-)environmental behaviour and (c) public-sphere behaviours ranging from passive forms (e.g. stated approval of environmental regulations, acceptance of taxes for environmental protection) to more active forms (e.g. joining and donating to environmental organisations), to environmental activism (e.g. active involvement in environmental organisations and demonstrations).

variables leading to behaviour. In this causal chain of factors that influence behavioural decisions, basic personal values are the fundamental determinant.

A further, well-acknowledged, contemporary model is the Theory of Interpersonal Behaviour by Triandis (1977), which considers attitudes, social factors (roles, norms), self-identity, affective factors (emotions) and facilitating (vs. inhibiting) factors together with habits.

8.3.3 Skills, Self-Efficacy and Situational Factors

While the VBN model covers various social and individual moral- and value-oriented motivational aspects, cognitive factors such as knowledge and skills and situational constraints are not considered in depth by this model. Some early and more recent models attempt to incorporate these variables.

An early empirically based model (constructed from meta-analysis of existing studies on pro-environmental behaviour) is the Model of Responsible Environmental Behaviour (REB) put forth by Hines et al. (1987). This model (Fig. 8.8) incorporates various internal cognitive and affective factors (i.e. social-psychological/personality variables). The increased complexity of this model results from it combining the TPB with environmental knowledge and skills components. Additionally, since studies indicate weak empirical relationships between the cognitive and affective and between the affective and behavioural components, thus indicating the involvement

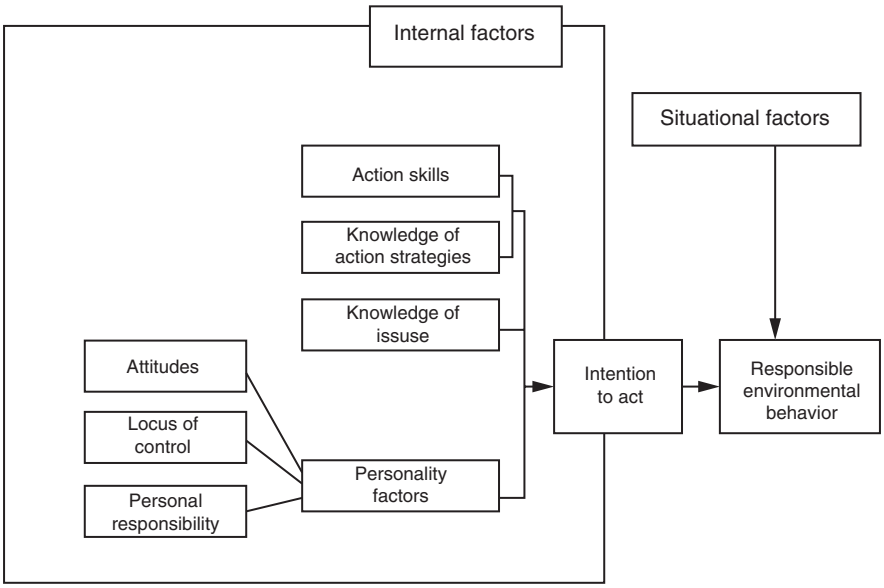


Fig. 8.8 The Model of Responsible Environmental Behaviour. (Hines et al. 1987)

of additional influential factors, this model includes the component of 'external/situational' factors (see Fig. 8.8). Situational, environmental and social constraints are crucial aspects when taking a systemic view of reciprocal determination of human action and social and environmental systems, for example, in the frame of socioecological systems.

When Hines et al. (1987) constructed the Model of REB based on the meta-analysis of environmental behaviour studies, only a few of these studies reported on the quantitative relationships between variables. Twenty years later, a meta-analysis of psychosocial determinants of pro-environmental behaviour was repeated with the aim of quantifying the strength of the relationships between these psychosocial variables (Bamberg and Möser 2007). The latter meta-analysis confirms that behavioural intention mediates the influence of all the other psychosocial variables on behaviour. Independent predictors of pro-environmental behavioural intention are attitudes, behavioural control and personal moral norms; the latter influenced by an interplay of cognitive (awareness of and knowledge about environmental problems), emotional (guilt) and social factors. Thus, awareness and knowledge about environmental issues is an important but indirect determinant of pro-environmental behaviour.

Taking the Hines et al. (1987) model of REB further led to a revised Model of REB (Hungerford and Volk 1990) in which there are three groups of variables that influence behaviour (Fig. 8.9):

1. Entry-level variables are considered prerequisite for responsible citizenship behaviour. The major variable of this group is sensitivity to the environment.
2. Ownership variables make environmental issues personally important. Major variables of this group are deep understanding of issues (the nature of the issue and its human and ecological consequences) and personal investment, which reflects the individuals identifying with the issue.
3. Empowerment variables are crucial in environmental education as they make the individual feel a sense of ability to influence. Major variables in this group are action, knowledge and skills for using citizenship strategies to effect change, locus of control (LOC) specifically an internal LOC (the individual's belief that they can achieve change and make a difference) and behavioural intention.

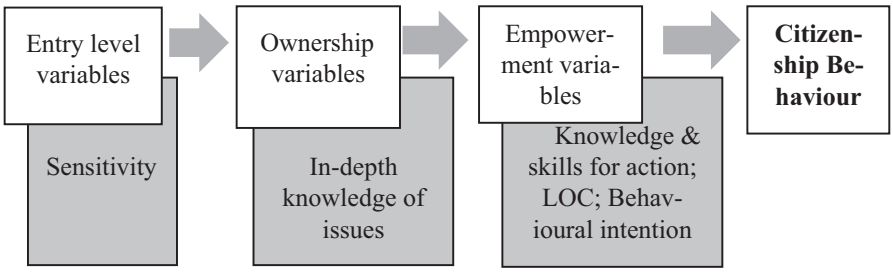


Fig. 8.9 Revised model of REB. (Adapted from Hungerford and Volk 1990)

At the time this model was developed, there was insufficient empirical evidence as to the relationships between the variables and behaviour, and their importance to environmental education was, and still is, acknowledged. According to this model, the variable categories also work in a complex but linear way (Fig. 8.9).

Cognitive factors and skills are more explicitly addressed in the Motivation-Opportunity-Abilities Model by Ölander and Thøgersen (1995) and similarly the Needs-Opportunities-Abilities Model (cf. Gatersleben and Vlek 1998), which argue that needs and opportunities together constitute the motivation to engage in a certain behaviour, while abilities and opportunities together constitute the behavioural control required for performing it.

8.3.4 New Approaches to Environmental Behaviour Models

According to Stern (2000), encompassing models of environmentally significant behaviour of individuals need to consider the following:

1. Personal attitudinal value-related variables: Personal motivational factors such as attitudes, personal norms, beliefs (outcome beliefs, evaluation of possible outcomes), values and goals that are part general and part specific to a certain behaviour. These correspond to motivational, affective learning goals in the educational frame.
2. Personal capabilities: These variables include knowledge and skills required for particular actions, which correspond to cognitive learning goals, together with behavioural control variables such as having enough time, money, power and resources.
3. Contextual factors: These include restrictions and options, facilitating and inhibiting aspects of the social and physical environment such as available technology, geographic physical aspects, material costs and rewards, policies, laws and regulations, social norms and expectations.
4. Habits: Past behaviour and its accumulated effect through the formation of habits.

These four domains of influential aspects can be and have been conceptualised and measured by a variety of environmental behaviour models in different ways. However, most behaviour models do not include all four domains, and some behaviour models include concepts that are difficult to align with these domains. For example, the TPB considers personal capabilities such as knowledge and skills only indirectly via their influence on perceived behavioural control, and it does not include past behaviour or habits as predictors of future behaviour. The predictive power of ‘past behaviour’ has not been overlooked by Ajzen (1991). On the contrary, he acknowledges that ‘past behaviour is the best predictor of future behaviour’ (p. 202), if internal and external determinants of behaviour remain stable. However, he regarded past behaviour as a tautological circular determinant of future behaviour that may be omitted in a good model and includes all actual explanative factors.

There are good reasons for this as, for example, explanations of the type 'I go by bike to work today, because I did so yesterday' do indeed seem tautological and empty and in terms of the conclusions to be derived from predictive models for behavioural change and environmental education. Still, the accumulation of past actions can lead to habits, and habitual behaviour may, to some extent, take place rather automatically without extensive, conscious behavioural decision-making.[2] This led to the development of specific behaviour modification approaches when confronting habitual behaviour, namely, raising awareness for the need to change behaviour and providing help and incentives for trying out new behaviours and refreezing new behaviours as environmentally friendly habits (Dahlstrand and Biel 1997; Lewin 1951). Furthermore, behavioural determinants for future behaviour will always be altered by the performance of a certain behaviour, as learning effects based on performance processes and outcome evaluations take place. So, there are also various arguments speaking in favour of past behaviour and/or habits as explanatory factors for future behaviour as advocated by Stern (2000). Still, the amount of variance explained by models including past behaviour may not be easily compared to the variance explained by models without reference to past behaviour, since stability of behaviour over time gives the former models a great statistical advantage in many behavioural domains, which does not always correspond to an increased understanding of the deeper determinants or causes of the behaviour.

Based on Stern's requirements for encompassing behavioural models, Hansmann and Steimer (2015, 2017) developed an integrative Model of Justified Behaviour (MJB). Accordingly, it considers personal motivational factors such as attitudes, values and personal norms, personal knowledge and skills, social factors and processes (social norms, roles, pressures, group dynamics), facilitating or inhibiting contextual factors (restrictions and options) and the formation of habits as explanatory variables for environmental behaviours (Fig. 8.10).

In addition, processes of justification have been included as crucial aspects of behavioural decision-making. According to Sykes and Matza's (1957) Neutralization Theory of Delinquency, justifications can enable people to deviate from personally accepted social norms by protecting them from self-blame and being blamed by others. Justifications can, therefore, deactivate existing personal norms and thus prevent them from being behaviourally effective. Justifications can also help to explain negative environmental behaviours of people who have internalised positive environmental behaviour norms and can contribute to our understanding of the reported discrepancies between attitudes and behaviours (e.g. Hansmann and Steimer 2015, 2017; Schahn and Bertsch 2003; Schahn et al. 1995; Diekmann and Preisendörfer 1992). Sykes and Matza (1957) distinguish post-behavioural justifications for norm-violating behaviours in the past, which they call rationalisations, from justifications that precede norm-violating behaviours, which they call neutrali-

[2] The importance of habits and automatic behaviour is stressed also by the theory of social practices. In relation to environmentally significant behaviour, social practice theory questions the idea that attitudes or values are drivers of behaviours and highlights the importance of habits and contextual factors [see, e.g. Shove 2010].

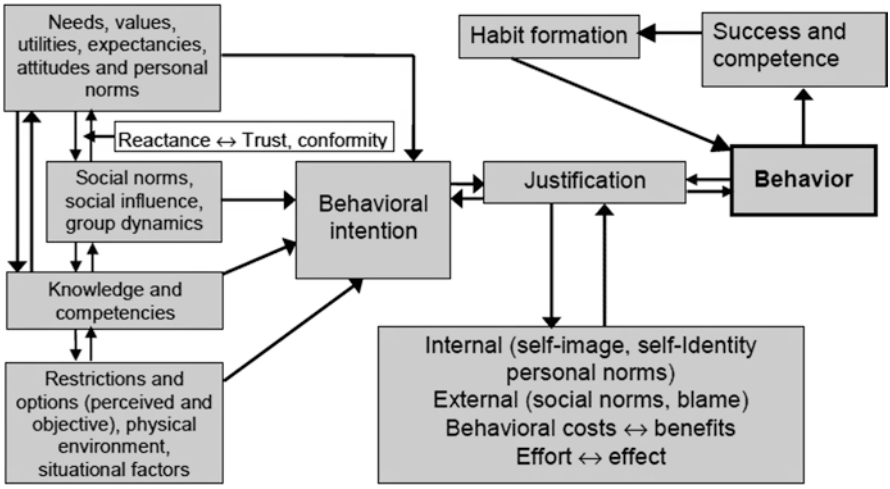


Fig. 8.10 Schematic depiction of the Model of Justified Behaviour (MJB) by Hansmann and Steimer (2015). (Adapted from Hansmann and Steimer 2015, 2017)

sations. Rationalisations for norm-violating behaviours in the past can serve as neutralisations for norm-violating behaviours in the future, and negative environmental behaviour can thus be stabilised over time leading to the formation of negative habits. According to the MJB, behaviour that has been displayed repeatedly without encountering difficulties can become a habit and may be performed both automatically and subconsciously without further processes of active, conscious justification and behavioural decision-making. Justifications need to be treated with care, including in environmental campaigns, since mentioning them directly may provide arguments for negative environmental behaviours.

The idea that past behaviour might predict future behaviour has been recently expanded, adding to the discussion the idea of behavioural clusters (Whitmarsh and O'Neill 2010) and the possible interrelations among different environmental behaviours (Thøgersen and Crompton 2009). It is not only the past behaviours of the same type but also past and present behaviours of other types of environmental behaviours that matter. A Behavioural Spillover Theory is being currently developed by Lorrain Whitmarsh and colleagues (Nash et al. 2017; Poortinga et al. 2013), who attempt to explain how one type of environmental behaviour might influence the occurrence of another. In other words, one habit could influence the development of another habit. For example, 'if people stop using single-use carrier bags and start bringing their own reusable bag to the shops, they may see themselves as more waste conscious, which then may lead to other waste-conscious decisions and behaviours' (Poortinga et al. 2013, p. 7). Whitmarsh and O'Neill (2010) explain this through the notion of environmental identity. Engagement in pro-environmental behaviour may encourage changes in environmental identity, which may then lead to further behavioural changes in line with their revised identity (Poortinga et al. 2013, p. 7). DEFRA (2008) draws attention to catalytic behaviours that might serve

as change starting points. Leveraging those 'catalytic' behaviours would bring about desired behavioural changes.

A newly emerging area of study, relevant to understanding the determinants of pro-environmental behaviour and with significant implications for educating for Environmental Citizenship, is the area of Positive Psychology of Sustainability. Pro-environmental behaviour is conventionally associated with negativity: negative feelings (e.g. fear, guilt) that move people to pro-environmental actions or negative feelings resulting from the efforts, perceived required sacrifices or trade-offs (e.g. discomfort, inconvenience, time, financial) associated with conducting pro-environmental actions. Positive Psychology of Sustainability focuses on positive emotions associated with pro-environmental behaviour. It assumes and asserts that involvement in pro-environmental behaviour has personal psychological benefits (e.g. a sense of achievement and satisfaction or sense of empowerment) and that these positive psychological outcomes reinforce pro-environmental behaviour and therefore lead to a reciprocal reinforcing process (Corral-Verdugo 2012). Kerret et al. (2014) propose a theoretical model that links pro-environmental behaviour with cognitive factors, such as hope, self-control and resistance to peer pressure, and variables of subjective well-being (Fig. 8.11).

According to the model, (1) environmental hope is a latent cognitive variable (indicated by agency thinking, pathway thinking and social trust) that mediates environmental behaviour as well as subjective well-being and (2) self-control is a latent cognitive variable (indicated by self-control skills and resistance to peer pressure) that moderates between hope and environmental behaviour. Since this is a newly emerging area, empirical research is needed to test the model in formal and non-formal frameworks. Initial evidence (Kerret et al. 2016) that pro-environmental behaviour and subjective well-being are both enhanced via the same environmental hope path emphasises the importance of promoting hope in environmental education.

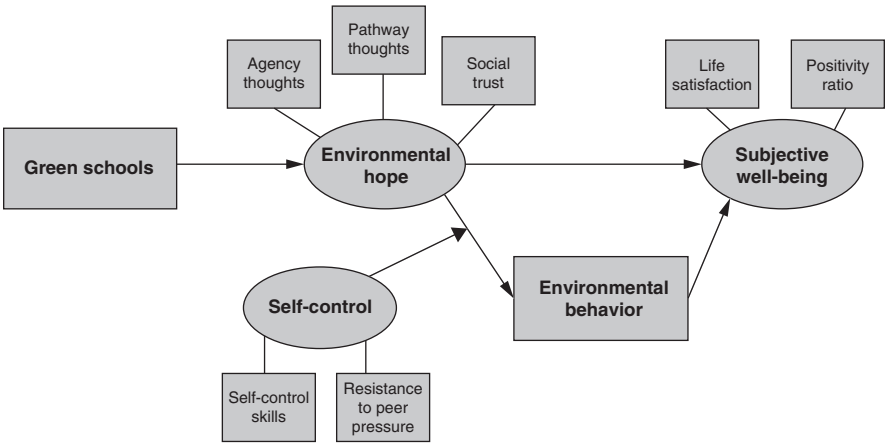


Fig. 8.11 Green schools' hope-mediated influence on students' environmental behaviour and subjective well-being. (Source: Kerret et al. 2014)

Their model also offers a 'solution to one of the barriers to promoting environmental behaviour; namely the need to choose between hedonic and normative goals' (Kerret et al. 2016, p. 8). Initial findings suggest that infusing people with environmental hope may simultaneously raise both pro-environmental behaviour (a normative goal) and subjective well-being (a hedonic goal). Focusing on developing an individual's environmental hope is relevant not only for formal education interventions but also for non-formal, environmental communication campaigns.

This presentation of models of REB concentrated mainly on theories that address internal factors, since educational interventions are concerned with developing the individual and cultivating the individual's attributes that may lead to active citizenship. Situational (i.e. external; contextual) factors also play a crucial role in achieving SD and a sustainable society. While adopting environmentally responsible behaviour starts with the individual, supportive institutional, political and social policies create the supportive climate that enables and encourages Environmental Citizenship at the individual level (Goldman and Kadish 2012).

8.4 Implications for Educating for Environmental Citizenship

Implementation of educational interventions to foster Environmental Citizenship might raise false expectations to see immediate behavioural change. Hysteresis Effect, which was first explained in the natural and exact sciences and then transferred to the social sciences, for example, to explain environmental activism (Bozonnet 2016), points to a possible lag between the input (e.g. the educational interventions at school) and the output (lifestyle changes including behavioural changes). Behaviours are dependent on the cultural history that an individual must deal and comply with (or alter). Thus, the impacts of educational programmes, as well as other factors presented in this chapter, should be seen as history dependent and requiring time in order to generate the outcome – the difference, or the anticipated active Environmental Citizenship. Hysteresis Effect also implies that none of the influences are linear but rather cumulative, interdependent and complex.

While none the above described models are able to explain all the aspects of human environmental behaviour, they imply important suggestions for the practice of Education for Environmental Citizenship:

- Focusing solely on promoting environmental knowledge may be considered ineffective and, in some aspects, even a controversial strategy. Considering this, Education for Environmental Citizenship programmes should be action based, i.e. provide the opportunity to experience and change something and get emotionally involved and see the effects.
- Social norms seem to be another important factor. In line with this, community-, group- and place-based programmes seem to be more effective than strategies limited to involving individual school students only within the framework of school.

- To shape students' values and attitudes, experience and emotion should be considered as inherent components of Education for Environmental Citizenship programmes. This also calls for teaching students how to handle their emotions and reflect their feelings.
- Following the Experiential Processing Theory, Education for Environmental Citizenship should implement elements of experiential learning. Education for Environmental Citizenship should develop affective relationship with one's local environment (urban and rural ecosystems and local nature), provide more detailed and accurate information on regional and global environmental processes and issues and develop imagery that is consistent with scientific knowledge and is best suited to the cultural contexts and individual mental models. Following Experiential Processing Theory, Education for Environmental Citizenship should provide positive experiences of diverse environmental issues and relevant environmental behaviours, including private (e.g. recycling, green consumption) and public-sphere behaviours (e.g. writing a letter to the local council, participating in an environmental campaign).
- Following the Behavioural Spillover Theory, Education for Environmental Citizenship should foster catalytic behaviours – those behaviours that are powerful changers of environmental identity and therefore infuse lifestyle changes including changes across various types of environmental behaviours. The greatest challenge is to identify these catalytic behaviours and embed them into the educational programmes. These might be context specific. For example, recycling may be a powerful case in many schools since it may further foster resource-saving behaviours. But caring for homeless dogs may be the most powerful case in another school, leading to fostering animal welfare activism and constraining consumption of some goods (related to harming animals and reducing their welfare).
- Following the Hysteresis Effect Thesis, (1) it points out that developing Environmental Citizenship is a long-term and continuous process. Student assessments at schools should focus on measuring efforts and personal engagement, rather than measuring results (i.e. outcomes, as understood in its many dimensions and types). This is because there is a lag between the educational input and the output (presence of Environmental Citizenship within the mental structures and lifestyles of the pupils). (2) Hysteresis Effect also points to the influences of general culture and families. Thus, Education for Environmental Citizenship should encourage community-based projects that are directed at broader attitudinal changes and behavioural shifts within society.

The apparent differences in levels of engagement with environmental behaviours among European countries suggest that Education for Environmental Citizenship should take into account the context in which it is applied. The starting positions are diverse, and educational programmes should therefore be adapted to national contexts.

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Chapter 9
Environmental Citizenship and Youth Activism

Pedro Reis

9.1 Introduction

The exercise of Environmental Citizenship is strongly associated with a citizen's capacity to act in society as an agent of change (ENEC 2018), and this depends on the development of a person's willingness and competence for a critical, active and democratic engagement in preventing and solving environmental problems. There is a call for a citizenry that is well informed and empowered to take appropriate actions on the seriousness of the environmental problems affecting our world (Gray et al. 2009; Hodson 2003). However, many citizens do not feel empowered enough to participate in decision-making processes regarding socio-environmental issues, and, at the same time, the faith and trust in politicians have decreased, and political apathy is gaining ground (Hodson 2014). Throughout the past decade, the surge in authoritarian government practices, the failure of popular movements to replace undemocratic regimes and the increase in populist movements all over the world are fuelling concerns about a possible 'democratic recession' (Diamond 2015). Part of the success of this movement has been credited to the failures in mobilising young people's political participation (Schulz et al. 2018; Jackson et al. 2016).

Civic engagement depends on students and their 'motivation to participate in civic activities, their confidence in the effectiveness of their participation, and their beliefs about their own capacity to become actively involved' (Schulz et al. 2018, p. 72). Research shows that a student's civic engagement can be supported and encouraged by school, with the help of (1) open school climates, (2) democratic structures within schools and (3) early opportunities for active participation, the promotion of students' civic knowledge and the predisposition to engage in civic activities in the future (Schulz et al. 2018; Pancer 2015; Roth and Barton 2004).

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Therefore, education represents a key element in counteracting low levels of civic engagement among young people, namely, through the promotion of democratic activism (Hodson 2014).

9.2 The Concept of Activism

Activism is a problematic concept, often associated with the social imaginaries of (a) radical and sometimes violent actions of fanatical groups, (b) practices of indoctrination that don't respect different points of view (Alsop and Bencze 2009) and (c) the spectacle of police and protesters clashing in public spaces (Calabrese Barton and Tan 2010). In some academic contexts (under the influence of Paulo Freire), the term 'activism' is associated with practice devoid of theory – or action without reflection (Freire 1970/1987). In Freire's opinion, the world's transformation requires a dialectical process between practice and theory (between action and reflection): theory devoid of practice consists of simple verbalism; and practice devoid of theory results in blind activism. However, in this chapter, the 'activism' refers to a process of collective, democratic, research-informed and negotiated problem-solving action on socio-environmental problems.

Community research-informed action is frequently considered to be a major aspect of scientific literacy (Hodson 1998), empowering students as critics and producers of knowledge, instead of placing them in the role of consumers of knowledge as school science practices often appear to encourage (Colucci-Gray and Camino 2014; Reis 2014; Bencze and Sperling 2012). This broader concept of scientific literacy includes students' development as a 'capacity and commitment to take appropriate, responsible and effective action on matters of social, economic, environmental and moral-ethical concern' (Hodson 2003, p. 658). It involves the exercise of students' environmental rights and duties, as well as the identification of the underlying structural causes of environmental degradation and environmental problems, developing the willingness and the competences for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means and taking into account the inter- and intra-generational justice (ENEC 2018). Current social and environmental problems can only be solved through science curricula oriented towards sociopolitical action in order to 'produce activists: people who will fight for what is right, good and just; people who will work to re-fashion society along more socially just lines; people who will work vigorously in the best interests of the biosphere' (Hodson 2003, p. 645). During the last 15 years, several authors have contributed to the development of this purpose, including Larry Bencze (2008), Jean and Laurence Simonneaux (2012), Steve Alsop and Larry Bencze (2014), Wolff-Michael Roth and Angela Calabrese Barton (2004) and Deborah Tippins et al. (2010).

Activism is frequently associated with a specific type of citizen science initiatives. The term citizen science has been used for decades to describe the participation of the general public in authentic scientific studies (Mueller and Tippins 2015)

with the broad aim of promoting learners' scientific and ecological literacy in formal and extended school settings (Fazio and Karrow 2015). Citizen science has been traditionally characterised as a top-down approach, comprising projects initiated by scientists and government agencies who enlist community members to collect data on issues with little relevance to citizens' lives. However, during last years and under the influence of critical science education, citizen science – combined with activism – was recast as a bottom-up pedagogical approach intended to promote students' interest in the community, the environment, life-long learning, democracy and social justice (Britton and Tippins 2015; Roth and Lee 2002). This approach resorts to education as a context to develop the competencies and community involvement of students, encouraging them to be active citizen scientists who contribute to the well-being of their communities (Britton and Tippins 2015). The ideology behind this combination of citizen science and activism puts an emphasis on learning about the health of the local community, developing socially responsible curricula, blurring the boundaries between subjects and breaking down the walls of the school – facilitating the connection between the school learning and the space outside the school where students and their families live (Britton and Tippins 2015; Rodríguez 2015; Martinez and Alsop 2014). This way, citizen science is not only about collecting and analysing hard data about natural phenomena. Accordingly, students can be active citizens who are critically engaged in learning about eco-socio-scientific issues and are committed to disseminating and denouncing the unscientific basis of prejudice and discrimination (Reis et al. 2015; Mueller and Tippins 2012). Students move from a position of learning to being engaged in acts of citizenship and practices of science through activism (Haverkos 2015).

Citizen science combined with youth activism promotes a deeper comprehension of how science works and represents a powerful catalyst for empowering future citizens with the willingness and the higher-level abilities for participating in the global effort of sustainability and assuming the responsibility for future generations. Youth democratic activism develops young people's critical scientific literacy, allowing people to 'think for themselves and reach their own conclusions about a range of issues that have a scientific, technological and/or environmental dimension' (Hodson 2011, p. 28). Critical scientific literacy allows learners 'to take appropriate, responsible and effective action on matters of social, economic, environmental and moral-ethical concern' (Hodson 2011, p. 28), increasing their capacity to make choices rather than accept the prescriptions of others.

9.3 Supporting Youth Activism

According to Sleeter and Cornbleth (2011), the engagement of young people in democratic activism requires students to feel themselves as having the rights, responsibilities and competencies to participate in complex thinking, decision-making and problem-solving processes. These competencies and inclinations for democratic activism are not promoted through the particular contributions of

curricular units or classroom activities. They are developed over time, through repeated active learning experiences in formal and informal contexts; experiences that go further than 'applying knowledge' to everyday contexts – as many school curriculum documents propose – and supporting learning through sociopolitical action (Alsop and Bencze 2014). Activism requires the development of an atmosphere of shared responsibility and commitment and a collaborative relationship between schools and communities in the attempt to find appropriate solutions for the problems they identify as important and socially relevant (Hodson 2014).

The STEPWISE programme (Science and Technology Education Promoting Well-being for Individuals, Societies and Environments) developed by Larry Bencze offers a framework for curriculum and instruction centred on students' engagement in self-led and open-ended inquiry, based on their own primary (experiments and correlational studies) and secondary (using data collect by others and made available in the Internet) research for developing plans of action to address socio-scientific or socio-environmental issues (Bencze 2013, 2017). The key idea of STEPWISE is to encourage and empower students to use science and technology in actions for helping others and the planet. Under the STEPWISE framework, many activist initiatives have been developed in several countries and educational contexts with a considerable impact on students' active citizenship competences (Alsop and Bencze 2014; Bencze 2017).

Influenced by the STEPWISE framework, the 'WE ACT – Promoting Collective Activism on Socio-Scientific and Socio-Environmental Issues' is another project that has been supporting teachers and students from several countries and school levels in taking informed and negotiated actions to address social and environmental issues (Conceição et al. 2019; Reis and Tinoca 2018; Scheid and Reis 2016; García-Bermúdez et al. 2014, 2017; Reis 2014). It is centred in (1) the promotion of an active inquiry-based learning regarding real-life problems associated with science and technology and (2) the stimulation of students' participation in collective democratic problem-solving action (e.g. through art initiatives and uses of Web 2.0 tools). Baptista et al. (2018) present and discuss an example of youth activism – developed within WE ACT – centred on a specific environmental problem identified by children: the collapse of bee colonies in a rural area in Portugal. The activists were 26 students from an elementary school aged between 8 and 10 years old. During a 2-month period, students were engaged in the identification of possible causes and solutions for the selected problem. The investigations carried out by the students in combination with their knowledge of the agricultural practices used by their families allowed them to recognise the inadequacy of these practices and learn about environmentally sustainable alternative practices. As a way to develop a collective action in their local community, the students wrote a manifesto – using arguments focused in the use of pesticides and exposing some of the local agricultural practices as a possible cause of the bees' disappearance – and asked the local population to subscribe to it. This manifesto was proposed by the students and subscribed by the population during a public session in the school. It worked as a commitment to change agricultural practices that were harmful to the ecosystem, and for the adoption of more environmental and sustainable methodologies. This activist initiative

facilitated the development of scientific knowledge and skills for action, showing the possibility of promoting young students' engagement in collective problem-solving actions on environmental issues.

In both formal and non-formal contexts, there are several possible ways for young people to be involved in activism in the private and public sphere, namely: (1) education initiatives aimed at changing the behaviour of other citizens; (2) the organisation of pressure groups responsible for writing and distributing manifestos/petitions and boycotting certain products developed through controversial practices; (3) volunteer initiatives promoting a more fair, ethical and sustainable world; (4) the proposal of innovative solutions for local, national and/or global problems; and (5) changing their own behaviours (Baptista et al. 2018; ENEC 2018; Bencze 2017; Hodson 2014; Reis 2013).

Art-based approaches and Web 2.0 tools can be quite powerful towards the implementation of collective activism on socio-environmental issues (Reis 2013). The research and the discussion inherent to the development of exhibits and drama activities on socio-environmental issues can be particularly useful, both in terms of learning about the contents, the processes and the nature of science and technology and in terms of the students' cognitive, social, political, moral and ethical development (Reis and Marques 2016; Kolstø 2001). Exhibitions and drama activities about socio-environmental issues, as a dialogical context, can raise questions, elicit personal reflection and stimulate discussions between students and visitors, transforming both of them into learners and political activists (Linhares and Reis 2017; Reis and Marques 2016; Levinson et al. 2008; Braund and Reiss 2004). The development of the exhibits creates an opportunity for students to participate in activism on specific environmental issues, encouraging exhibit visitors to take action (Reis and Marques 2016).

Web 2.0 tools, especially those allowing collective communication (namely, through social networks), can be very useful for activist initiatives (Stegmann et al. 2007), providing all citizens with powerful means to express their voices and visions, fostering independent forms of communication/intervention and a participatory model of democracy (Marques and Reis 2017; Scheid and Reis 2016; García-Bermúdez et al. 2014, 2017; Krstovic 2014; Zoras and Bencze 2014). Through these forms of activism, each student can assume the role of active problem-solver rather than that of a spectator relying on experts to point out directions.

Web 2.0 tools can have a strong impact on citizens' cultural/social/political empowerment (Zoras and Bencze 2014; Kellner and Kim 2010). According to several authors, interactive means of conveying information about social and political issues (e.g. social media) are more effective in promoting civic participation than traditional media (Kahne et al. 2013; Segerberg and Bennett 2011; Bachen et al. 2008).

A great example of youth activism spread by social media was triggered by the Swedish teenager Greta Thunberg. In August 2018 (when she was 15 years old), she planned a strike at school and a protest outside the Swedish parliament, urging politicians to act on global warming in order to avoid its disastrous consequences connected with rising sea levels, extreme weather events, species loss, diminished water

supplies, economic costs and humanitarian crises. Her protests captured attention around the world and inspired a global movement leading to strikes in many different countries and raising peoples' awareness about the climate change and the urgency of action on this issue. Her message, disseminated through social media and presented in international forums, mobilised children, teenagers and adults around the world, demanding immediate climate action from politicians and business leaders. Several teen climate activists like Greta Thunberg are exerting pressure through such initiatives spread and organised through social media.

Research suggests that students' activism on socio-scientific and socio-environmental issues have a positive impact on (a) their knowledge of these issues; (b) their conceptions about the nature of science; (c) their inquiry and citizenship competences; and, eventually, (d) the well-being of individuals, societies and environments (Reis and Tinoca 2018; Bencze 2017; Bader and Laberge 2014; Zoras and Bencze 2014; Bencze and Carter 2011; Roth and Désautels 2002; Roth and Lee 2002). Students' involvement in activism initiatives promotes (a) communication skills through the exchange of arguments for specific actions; (b) scientific inquiry skills during the identification of the causes and possible solutions for problems; (c) critical thinking skills, through complex problem-solving; (d) creativity, during the development of innovative proposals for unique contexts; (d) perseverance, through the understanding that change takes time, effort and commitment; and (e) empowerment, when students realise that their actions can have a positive impact in society (Conceição et al. 2019; Bencze 2017; Marques and Reis 2017; Schusler and Krasny 2015; Carter et al. 2014; Krstovic 2014; Schalk 2008).

9.4 Conclusion

Activism constitutes a major aspect of Environmental Citizenship, allowing citizens to become active problem-solvers instead of simple spectators relying on experts' opinions. Consequently, students' involvement in activism initiatives represents a key element in Education for Environmental Citizenship, creating an excellent context for the development of the knowledge, skills, values and attitudes that empower citizens as agents of change, who are capable of devising and implementing individual and collective actions aimed at solving the contemporary environmental problems (ENEC 2018). Youth activism initiatives allow students to exercise their environmental rights and duties, understand the structural causes of environmental problems and develop the necessary competences to address those causes. Through activism, students move from a position of learning to a new position of engagement in acts of citizenship and practices of scientific inquiry. Students are therefore empowered as producers of contextualised and socially relevant knowledge, instead of being simple consumers of knowledge.

Youth activism initiatives have the potential to strengthen the bonds between school and the communities where students and their families live. Through these initiatives, students develop positive perceptions regarding the importance and

social relevance of a science education with socially responsible curricula, strongly committed with the health of the communities and the environment.

The study of recent young activist movements can shed some light on the factors that are important in mobilising young people into political participation and, consequently, on how schools can counteract the low levels of civic engagement among young people, namely, through the promotion of democratic activism.

The youth activism approach assumes education as a democratising force and a catalyst for individual development and social transformation (Freire 1970/1987; Dewey 1916). Through this approach, school becomes a live forum for liberating dialogue and a real context for the exercise of Environmental Citizenship. There is a global urgency for pedagogical approaches that include youth activism as a core and fundamental step for the promotion of Environmental Citizenship.

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Chapter 10
Education for Environmental Citizenship and Education for Sustainability

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10.1 Similarities and Differences Between Education for Environmental Citizenship and Education for Sustainability

In view of the required development towards more sustainable societies, citizens need to be supported and taught to overcome any important gaps or challenges in being part of a sustainable society. Environmental education focuses on promoting environmental knowledge and enhancing environmentally friendly attitudes and values, as well as achieving both the citizenship and higher-order cognitive skills necessary to promote an ecologically sound lifestyle. The teaching/learning objectives in formal settings are building scientific knowledge and developing the students' relation with nature through active learning pedagogies such as fieldwork and outdoor experiences. It is usually considered a school subject or a topic within

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Biology (Breiting 2007). Non-formal environmental education, such as awareness-raising campaigns and knowledge-sharing projects, often aims at changing peoples' personal lifestyle, e.g. saving energy, recycling and/or buying organic food. Traditionally, environmental education builds on the notion of fostering environmentally concerned and literate citizens (Hollweg et al. 2011; Kollmuss and Agyeman 2002). These aspirations could be seen as a form of Environmental Citizenship. However, Environmental Citizenship never was at the heart of our education and still remains a lively disagreement about the aims of environmental education that may lead to conflicting goals and outcomes (Schild 2016). An important idea has been to build so called pro-environmental behaviour through cognitive and affective learning. This is supported by several psychological models (e.g. Kollmuss and Agyeman 2002; Ajzen 1991; Hines et al. 1987). Hines and colleagues, for example, (1987) presented the model of responsible environmental behaviour. In their model the possession of the 'right' environmental attitudes and environmental knowledge is suggested to lead to raised intention to act pro-environmentally. Similarly, in his theory of planned behaviour, Icek Ajzen (1991) argued that possession of attitudes and beliefs towards a certain action will lead to a higher likelihood of performing the actual pro-environmental behaviour. However, Kollmuss and Agyeman (2002) claim that the link between the right attitude and knowledge and pro-environmental behaviour is not that clear-cut. In their model of pro-environmental behaviour, affective and cognitive components (constituting environmental consciousness), together with personal and societal factors, are suggested to lead to pro-environmental behaviour (Kollmuss and Agyeman 2002). As a consequence of the idea of fostering pro-environmental behaviour, environmental education has led to a focus on the teaching of ecological knowledge and facilitating the development of ecocentric attitudes.

Education for Sustainability (EfS) is often considered, in many educational systems (UNESCO 2009), to be an integrative concept of environmental education where the ecological dimension of environmental education is more strongly supplemented with social and economic dimensions (Kopnina 2014). In formal teaching this often means that ecological science content is mixed with interdisciplinary

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or multidisciplinary collaborative work with social and economic content (Scott and Gough 2003). This way of describing sustainable development by the three interconnected, hierarchically equal and mutually important dimensions of the environment, economy and society is often referred to as the 'three pillars' of sustainability (Giddings et al. 2002). This was emphasised in the Rio+20 meeting (United Nations Conference on Sustainable Development), where a new integrated agenda beyond 2015 was proposed to ensure the promotion of an economically, socially and environmentally viable future for the planet, as explicated in the Sustainable Development Goals (UN 2015). Accordingly, the sustainable development agenda should fully integrate 'the economic, social and environmental dimensions of sustainable development in a coherent, holistic, comprehensive and balanced manner' (UNEP 2015, p. 3). This way of understanding and working with sustainability around the three dimensions has become a global benchmark and a common ground for most sustainability initiatives worldwide. The main idea is that sustaining the environment and ecosystems needs to be based on considerations of social and economic development.

Education for Environmental Citizenship is defined by ENEC (2018) as 'the type of education that cultivates a coherent and adequate body of knowledge as well as the necessary skills, values, attitudes and competences that an Environmental Citizen should be equipped with in order to be able to act and participate in society as an agent of change in the private and public sphere, on a local, national and global scale, through individual and collective actions, in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, in achieving sustainability as well as developing a healthy relationship with nature. Education for Environmental Citizenship is important to empower citizens to exercise their environmental rights and duties, as well as to identify the underlying structural causes of environmental degradation and environmental problems, develop the willingness and the competences for critical and active engagement and civic participation to address those structural causes, acting individually and collectively within democratic means and taking into account the inter- and intra-generational justice' (ENEC 2018).

From the above description, it is evident that there are some similarities between Education for Environmental Citizenship and Education for Sustainability. Both aim at the same type of action abilities and to bring about environmental and social sustainability, but there are some possible differences in the overall teaching emphases.

There are, however, some differences between Education for Environmental Citizenship and Education for Sustainability. Historically, the weakest dimension in Education for Sustainability has been societal, where social justice issues have been inadequately addressed (Du Pisani 2006). The knowledge of how to democratically change a society and the social justice effects of those changes on the local and global society have, at least at the beginning, not been sufficiently emphasised in Education for Sustainability, as its roots lie in environmental education with a partly narrower focus on environmental protection and conservation of resources (Bolscho and Hauenschild 2006). These sociopolitical dimensions are emphasised in

Education for Environmental Citizenship, along with the aim of promoting people to act according to the public environmental good (Dobson 2007). In that sense, Education for Environmental Citizenship can be considered as a developed, integrated and applied approach that is in accordance with Education for Sustainability's broader context and by which the content and abilities to really make a societal change for a better world can be fulfilled. In contrast with Education for Sustainability, where citizenship is only one of the 20 Key Themes (UNECE 2005), Education for Environmental Citizenship is specifically focused on Environmental Citizenship and how this could be achieved. Environmental Citizenship never was at the heart of our education, and Education for Environmental Citizenship is doing exactly this to bring Environmental Citizenship to the heart of our education. Jacobi (2005) stated that 'EE should be placed in a broader context, namely education for citizenship and understood as a practice that is decisive in the consolidation of citizen-subjects' (p. 243). In the same point of view, according to Loureiro (2011), Environmental Education (EE) is a constituent part of social and environmental movements, and the process of constructing planetary citizenship or ecocitizenship (in ENEC Environmental Citizenship) is considered as a new concept. In addition, Education for Environmental Citizenship explicitly emphasises the practice of environmental rights and duties, the identification of underlying structural causes of the environmental problems and developing the willingness and competencies for critical and active engagement and civic participation to address structural causes, acting individually and collectively, within democratic means and considering inter- and intra-generational justice. These aspects are not explicitly in focus both in Education for Sustainability and EE. However, Education for Environmental Citizenship builds upon and integrates the pre-existing approaches in EE and Education for Sustainability.

10.2 Why Education for Environmental Citizenship Is Crucial

Other species have previously left their imprint on the earth, and their actions have affected and changed the planet (e.g. the proportion of oxygen in the atmosphere increased because of plants photosynthesis activity). The human species is also changing it in such a substantial way that the current era is often coined as Anthropocene (Crutzen 2006). This term has emerged as a popular scientific term to designate the current period of the Earth's history during which humans have a decisive influence on the state of the Earth's system. Although there is critique about the correctness of this name choice (Zalasiewicz et al. 2011), it has been demonstrated that we will have geological records of the greatest and fastest degradation of ecosystems associated with different human activities (from Neolithic agriculture land use changes to the technological revolution of the last 60 years, including the recording of a nuclear age by radioactive waste and current planetary climate change

which is occurring at unprecedented speed). In the age where some of the planetary ecological limits have already been exceeded (Rockström et al. 2009), the Education of Environmental Citizenship in understanding what those circumstances mean in areas that affect individual health (e.g. air and water pollution), social health (e.g. collective movement to solve an environmental injustice) and political health (e.g. preventing conflicts in the face of resource depletion) is essential.

It is crucial that an Environmental Citizen can comprehend that the environment embraces and encompasses all spheres that relate to our societal structure (Fig. 10.1) in order to understand the problems and look for solutions. Resilient human systems depend on resilient ecosystems. The economy is within the ecosystem, the products, and the wealth, all of them come from the ecosystem. The Millennium Ecosystem Assessment (MEA 2005) illustrates how the human well-being depends on the proper functioning of ecosystems and that this needs to be maintained for the continuing provision of the 'ecosystem services' we take advantage of (MEA 2005).

Being aware of the imperative need to maintain the proper functioning of ecosystems for human well-being means to reconcile with the environment. It is difficult to continue advancing as a sustainable society while turning its back on nature. That is why individuals with the knowledge and skills to defend the 'foundation' of human well-being need to be appropriately cultivated (educated) and trained as education is the driving force for promoting social changes (Hansmann 2010). Previous social changes have occurred during human history that have made our society take the next step in ethic evolution. For example, slavery abolition made humans more civilised with others. Similarly, another step must be taken to reach a higher level of civilization in terms of our relationship with our environment, and this requires a leading role that the Environmental Citizen should take. A resilient citizen, who can adapt to the new events and threats, is also required to deal with future changes at environmental, societal and political levels.

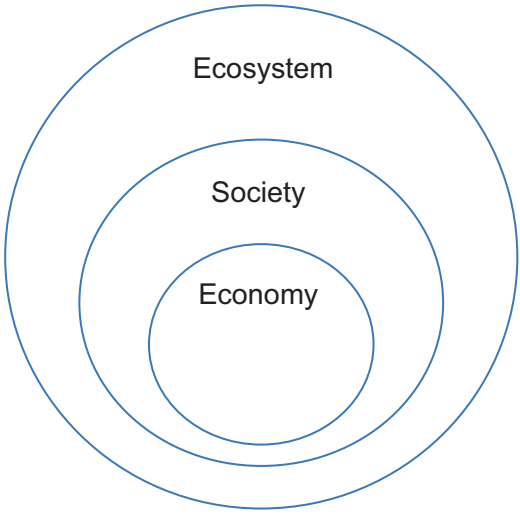

Fig. 10.1 Russian doll model. (Modified from Myllyviita and Leskinen 2013)

10.3 The Duty to Act and Spheres of Environmental Citizenship Action

In the domain of ethical values, responsibility depends on the level of understanding and perception of these values by people and by society. It refers to normative principles that determine the behaviour of people at any time and situation. The development of environmental knowledge and values leads to higher levels of environmental responsibility (Slavoljub et al. 2015) as those who have the knowledge also have the duty to act. A literate citizen, someone educated who can understand the problem, the structural causes and the interrelationships and who has the skills and competences to look for solutions, cannot be idle. However, the inaction of enlightened persons has been recently described by Plotica (2019), pointing out the general behaviour of persons who evade or deny a citizenship responsibility, despite the accumulated scientific evidence and consensus of our impact and subsequent consequence on ecosystems. To exercise this responsibility, one must also learn to assert their guarantees against political arbitrariness or against powerful lobbies. Environmental Citizens have the responsibility to support and foster future behavioural changes in different spheres. For this they need to be empowered in order to increase adherence to Environmental Citizenship values. Education for Environmental Citizenship means to teach in participatory ways, not only theoretically but actively, forming motivated citizens who are capable of participating in collective problem-solving and decision-making processes. So, it is necessary to promote ways of committed thinking and regulating our actions based on interpersonal commitment and individual and collective responsibility. Being aware of one's own behaviour and consequence is the first step to modify attitudes and assume responsibility. It can be understood as preparatory to an ethical relationship with all of society and nature (Plotica 2019).

Environmental awareness develops feelings and respect beyond the environmental scope and in some way should allow a wider sustainable development with social, political, economic and cultural implications. Citizen participation is much more than simply throwing your vote into the ballot box. In an active community with a high level of commitment, there are other options for public participation and political influence (e.g. through public institutions and other organisations) with the ultimate final goal of producing change in society. Environmental Citizens should properly use the consultation and discussion mechanisms that enable them to take part in the decision-making processes. Effective participation in decision-making is a key tool for addressing the problems that society currently faces (Löwy 2006). Moreover, it has been shown that participation provides opportunities for learning and practising environmental responsibility (Heras 2007).

Education for Environmental Citizenship includes actions in the private and public spheres as well as organisational behaviour. According to Stern (2000), environmentally relevant private sphere behaviours have a direct impact on the environment and actions, including consumer choices (sustainable consumption) such as buying organic products, avoiding purchases from companies harming the environment,

saving energy in the household, responsible waste disposal (non-littering, recycling) and transport, travel behaviour and the maintenance of household equipment. Public sphere behaviours, according to Stern, influence the environment rather indirectly through politics and policies which makes their impacts crucial. He assigns these behaviours to a continuum, ranging from more passive actions such as willingness to pay environmental taxes and passive policy support to more active behaviours such as voting, making a donation or being member of an environmental association. More activist forms, such as campaigning and lobbying, making links with decision-makers, taking part in a demonstrations, attending meetings and providing support by being there, voluntarism, taking part in decision-making and being involved in local politics, are also behaviours.

In addition, people also exert substantial influences via their actions as members, employees or representatives of organisations. For example, students can join green campus initiatives, and employees in a company can develop and enact 'green' processes in their company, including the purchase of environmentally responsible products. Being a good Environmental Citizen in the private sphere can move others to take the same path, but individual action should not displace or replace political, organisational and/or institutional ones (Plotica 2019).

10.4 Competencies That Need to Be Promoted by Education for Environmental Citizenship

The European reference framework on key competences for lifelong learning (EU 2006) proposed that young people should be helped in developing social and civic competences, defined in terms of knowledge, skills and attitudes, during their school education. The European framework also demands greater opportunities for students to actively participate in, for example, school-based activities with employers, youth groups, cultural activities and civil society organisations (De Coster et al. 2012).

An Environmental Citizen should have a knowledge of basic democratic concepts including an understanding of society and social and political movements and major social developments, both past and present. This citizen also requires critical thinking and communication skills and the willingness to participate constructively in the public domain. The sense of belonging to society at various levels is key for Education for Environmental Citizenship. One of the most important Education for Environmental Citizenship aims is preparing students for environmental protection engagement with repercussions at social and economic levels. Education for Environmental Citizenship needs to be efficient to ensure that students have the necessary knowledge, skills and attitudes to contribute to the development and well-being of the society in which they live.

Environmental Citizenship Education takes into consideration the main four aspects outlined in the Tbilisi Declaration (1977) but with a more contemporary

view and expands on the developed perspective under a change-oriented educational approach:

1. Knowledge: In Education for Environmental Citizenship, this includes knowledge of ecological concepts and processes that provide the foundations for understanding the human impact on ecosystems, of the interrelationships between human and natural systems, of ecosystem services, global change, links between human activities and environmental problems, environmental health and environmental action strategies.
2. Critical thinking, analytical skills and problem-solving skills: This involves abilities to critically analyse and evaluate environmental information (environmental, social and economic data), look for scientific evidence-based information and recognise, distinguish and counteract fake news.
3. Attitudes and values: Environmental awareness and sensitivity, internal locus of control, sense of environmental justice, assumption of personal environmental responsibility and averseness to 'enlightened inaction'.
4. Active participation: Putting into practice the knowledge and skills in environmental issue resolution and enhancing civic engagement aiming at environmental and social change.

It is significant that sociopolitical knowledge is addressed by Education for Environmental Citizenship alongside ecological knowledge and that citizenship skills are recognised alongside higher-order thinking skills as foundational bases of advanced sustainability-oriented environmental literacy (Goldman et al. 2013).

Four proposed Education for Environmental Citizenship competences (C1–C4) are:

- Education for Environmental Citizenship-C1: Competence for critical analysis, establishing interrelations between the social, economic and environmental aspects from local to global levels
- Education for Environmental Citizenship-C2: Competence in the sustainable use of resources and in the prevention of negative impacts on the natural and social environment
- Education for Environmental Citizenship-C3: Competence in the application of ethical principles at personal, local, national and global scales related to the values of Environmental Citizenship
- Education for Environmental Citizenship-C4: Competence for active participation in community processes enhancing environmental protection through environmental and social change

In order to reach these competences, efforts should be taken to increase the initial teacher education following recommendations to reform (or modify) the curricula to be more focused on Education for Environmental Citizenship. Special attention should be paid to introduce change in order to better prepare teachers in primary and secondary education, for instance, by establishing better educational skills on Environmental Citizenship at undergraduate and graduate courses. Education for Environmental Citizenship teachers need to be able to develop practical experiences

that are gained through school life and activities in wider society to improve the relevance of Environmental Citizen course contents for students.

The development of assessment methods for measuring progress towards the implementation of key competences, skills development and changing attitudes is crucial. Improved tools to assess social and civic competences are necessary. The creation of guidelines for evaluating student participation in school life and in wider society could be an efficient assessment strategy. Other general tools can be personal roles designated to students in the school (i.e. the water keeper), the validation of participation outside school (voluntary activities) and the objective measures of goal attainment in citizenship subjects and projects (better waste separation level).

10.5 Fostering the Idea of Sustainability Through Education for Environmental Citizenship

To resolve sustainability issues, Environmental Citizens need to face their complexity and context-dependent characteristics (Stables and Scott 2002). Sustainability is, to some extent, a vague normative concept which implies that critical thinking and mutual negotiations and discussion are required to identify, in a concrete situation, what sustainability means and what options or decisions are sustainable. Education for Environmental Citizenship needs to reconnect contemporary human societies to all other spheres of the living planet and reduce the great cognitive and emotional distance that currently separates humans from their environment, enabling people to value and respect our planetary life support system, rather than view it simply as a 'resource' to be exploited (Steffen 2019). This means that Education for Environmental Citizenship should help learners understand the complexity of social-ecological systems and identify structural causes of environmental degradation. With this in mind, Education for Environmental Citizenship broadens the perspective from local to global aspect and emphasises the interrelationships and interdependences. In addition, sustainability learning is a multilevel concept taking place at the individual level as well as on the level of social aggregates, groups, organisations and society as a whole. This corresponds with the emphasis of Education for Environmental Citizenship on the political dimension and the collective actions aimed at sustainability-oriented change. Environmental Citizens shall use their skills and competences through the involvement in local decision-making and action towards community goals, consequently achieving changes in society. The education for this purpose should therefore provide knowledge, skills and competences for real-world problem-solving processes in contexts of polycentric governance reaching from local to larger scale levels. Knowledge of the design principles for effective regulations and problem-solving as identified in research on collective action (Poteete et al. 2010; Ostrom 1998, 2009) and the knowledge of sustainability-oriented concepts such as resilience and co-management (Folke 2006; Olsson et al. 2004) are therefore as important as gaining skills through personal experiences in

such collective problem-solving processes, for example, through case studies and project-based learning. These experiences enhance the capacities of linking knowledge to action and the ability to work in teams and in different knowledge communities (Brundiers et al. 2010; van Kerkhoff and Lebel 2006).

Teachers, mentors and scientists need also to foster Environmental Citizenship and engage more effectively with other parts of society to transform it into a more sustainable society through education. Civil society needs to be in open conversation with the state (Seed 2019) to encourage policy makers to take appropriate decisions and move forwards from calls to action. Education for Environmental Citizenship should provide citizens with the necessary competences to achieve this. Political and communication skills are therefore crucial assets required by Environmental Citizens as well as environmental and sustainability-oriented knowledge, attitudes and values to motivate them to take on responsibility for action.

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Part IV
Environmental Citizenship in Educational Levels

Chapter 11
Environmental Citizenship in Primary Formal Education

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11.1 Characteristics of Primary Formal Education

The concept of 'primary formal education' reflects both the schooling period and the type of educational settings. Primary education, as an introductory schooling period, represents an important stage in children's development. According to UNESCO (2007), this is from the age 5 to 11. From the perspective of Education for Environmental Citizenship, primary education is the appropriate period for laying the foundation of children's future willingness to actively participate in responsible behaviour at both individual and collective levels. Some studies show that students at earlier ages of primary school are more willing to participate and show better outcomes after educational interventions aimed at developing key values and skills for Environmental Citizenship (Ampuero et al. 2015).

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The concept of 'formal education' is, however, less straightforward. Formal education is interpreted as mandatory, usually within a school setting, and delivered by teachers (UNESCO 2012; Patrick 2010; Hofstein and Rosenfeld 1996). According to OECD (2018, p. 1), formal learning is "always organized and structured, and has learning objectives. From the learner's standpoint, it is always intentional: i.e. the learner's explicit objective is to gain knowledge, skills and/or competences. Typical examples are learning that takes place within the initial education and training system or workplace training arranged by the employer."

However, the borders between 'formal', 'non-formal' and 'informal' education are often blurred. Teachers may use both formal and non-formal settings to achieve both intended and unintended educational outcomes; they may apply teacher-centred (instrumental) and student-centred (emancipatory) approaches (Wals et al. 2008) or combine mandatory teaching with free choice activities for motivated students. Because of this, some authors call for a 'hybrid approach' (Hofstein and Rosenfeld 1996).

As non-formal education is the subject of another chapter, we focus on learning that occurs as a part of primary education school curricula, and it is delivered by teachers, in school settings.

We focus specifically on the following two questions:

- What are the most important educational goals regarding the development of Environmental Citizenship in primary formal education?
- How can these goals be achieved in primary formal educational settings?

In this chapter, we start with a brief overview of the educational approaches relevant in developing Environmental Citizenship at primary level. Then we discuss the way Education for Environmental Citizenship is promoted by curricular materials. In the last part, we provide specific examples of educational outcomes and relevant methods for developing Education for Environmental Citizenship.

11.2 Education for Environmental Citizenship: Relevant Approaches

The Global Education Monitoring Report (UNESCO 2016) claims that the 'transformation needed for a cleaner, greener planet' demands innovative, creative and integrative thinking, and this requires interactive, discursive and experiential teaching and learning (Cotton and Winter 2010; Cotton et al. 2009). But, how should it be operationalised in the context of formal primary school education? What are the pedagogies that better prepare students to actively contribute to a sustainable future?

Studies such as Citizenship Education at School in Europe (2017) reveal the importance of directly linking together critical citizenship and environment. In this line, the approach known as ecopedagogy (Vilches et al. 2016; Misiaszek 2015,

2016; Kahn 2010) advocates a school curriculum linking the teaching and learning of environmental concepts to citizenship education.

From a socioecological perspective, Regula Kyburz-Graber (2013) claims that educational approaches intended at involving citizens in environmental issues should be participatory (an emphasis on collaboration and engagement), constructive (making people participate in the construction of meaning and solutions), critical (questioning the way things are and the way things should be) and reflective (thinking above causes and consequences and how to improve situations).

Along with the use of constructive, collaborative, critical and reflective activities (Kyburz-Graber 2013), classical models for shaping environmental behaviour reveal the importance of variables affecting the sense of ownership and empowerment (Hungerford and Volk 1990) and suggest the need for them to be taken into account when designing educational interventions to promote Environmental Citizenship.

Based on the key elements highlighted above, we can identify some pedagogical approaches with a huge potential to engage pupils in constructive, collaborative, critical and reflective activities while fostering students' sense of ownership and engagement in environmental issues. We cite some of them below:

Service learning is an educational approach that combines educational objectives with community service in order to provide a pragmatic and progressive learning experience while meeting societal needs (López-Azuaga and Suárez Riveiro 2018; Murphy 2008; Wilczenski and Coomey 2007; Golombek 2006). This approach is likely to develop a sense of ownership and empowerment in students, who can take an active part in addressing environmental issues and improving their world around them. Service learning connected to Environmental Citizenship may provide pupils with opportunities to make relevant and authentic contributions to the improvement of local environmental issues, and to act as responsible and responsive citizens.

Project-based learning (PBL) and inquiry-based learning (IBL) are both student-centred pedagogies, which engage students in the development of a project (PBL) or an inquiry (IBL) in order to address a particular problem, while developing understanding of the issue being addressed and acquiring interesting competences (Song 2018; Chu et al. 2016). Through this approach, students may develop environmental projects relating to pollution reduction, waste management, energy saving or sustainable transports and mobility, exercising as citizens, actively committed to the improvement of their local community.

The use of socio-scientific issues or socially acute questions to address environmental problems (Karpudewan and Roth 2018; Morin et al. 2013; Simonneaux and Simonneaux 2012) is another approach where students use reasoning to evaluate different arguments and negotiate positions and solutions to particular problems. In this respect, this pedagogy offers interesting opportunities to discuss different perspectives and conflicting interests and to strengthen students' critical thinking and sense of responsibility for a more sustainable world. The discussion of socio-scientific issues thus provides powerful scenarios to balance benefits and risks, duties and rights and to empower students in the search of fair solutions.

Currently, the discussion about which pedagogies better prepare students to face societal and environmental problems pays considerable attention to transformative

learning as a developmental process, entailing concepts such as construction of meaning in diverse groups (Wals and Lenglet 2016). This is consistent with the use of constructive approaches, interaction with complex real-world learning environments (König 2015) and co-learning (Lotz-Sisitka et al. 2015) in agreement with the use of collaborative approaches.

Action-based and task-based learning are other student-centred pedagogies with a potential to integrate the key features previously mentioned and to promote transformative learning. They are especially useful in the development of pupils' competences and problem-solving skills. Action-based interventions orient students' thinking and action to the achievement of a particular goal and involve critical analysis and reflection. According to activity theory, the activity of the individual is described as "active transformations of existing environments and creation of new ones through collaborative processes" and "meaningfully transforming the world in accordance with ideology-driven goals and agendas" (Stetsenko and Arievitch 2014, p. 65). Here, human activity is seen as a means to transform and create environments, but also to gain knowledge about the world (Andersen 2017). Similarly, in task-based interventions, learning is planned at the same time that students are trying to solve problematic situations, but in this case, the task can be approached in many different ways, according to students' competence level and motivations. Though action-based learning and task-based learning have been widely recognised as powerful pedagogical approaches, an analysis of curricular materials and teaching interventions for Environmental Citizenship at primary school level has revealed that these pedagogies are scarcely used (Andersen 2017).

We can say that, along with exhibiting the key features discussed before (being constructive, collaborative, critical and reflective), the pedagogies acknowledged provide interesting opportunities to develop ownership and responsibility for environmental issues along with a sense of empowerment as citizens who can actively contribute to improve the world around them.

In looking for effective ways to educate responsible citizens, some authors have applied the principles of positive psychology to design pedagogical interventions (Seligman et al. 2005), advocating the importance of promoting positive emotions, positive traits and positive reference institutions (families, schools and communities). In this line, Ampuero et al. (2015) describes an experience involving 499 primary school students intended to strengthen both affective and cognitive skills through local activities based on the principles of positive psychology, with an emphasis on the exercise of empathy and critical thinking. The intervention involved two big programmes – the 'Life Lab' – where students extended their school activities to their close surroundings (natural areas, gardens, vegetable markets) to improve the quality of life around them and the 'climbing wall' where students had to support and trust each other in order to achieve common goals. The findings showed that the interventions fostered students' collaboration, empowerment and decision-making in local activities and strengthened empathy, care, reflective thinking and personal and collective responsibility for a sustainable future.

11.3 Education for Environmental Citizenship in Curricular Materials

The idea of promoting competence for Environmental Citizenship in curricular materials has been repeatedly supported. Guidelines for excellence published by the North American Association for Environmental Education (NAAEE 2004) recommend that:

> Environmental education materials should promote civic responsibility, encouraging learners to use their knowledge, personal skills and assessments of environmental problems and issues as a basis for environmental problem solving and action (p. 4).

The materials should also focus on skills building enabling students to address environmental issues (p. 4). Specifically, learners should be "provided with opportunities to develop a variety of citizenship skills, including participation in the political or regulatory process, consumer action, using the media and community service" (p. 10).

In light of Education for Environmental Citizenship a recommendation to engage students into community-based projects should also be mentioned:

> Individual and community strategies for citizen involvement and provide learners with opportunities to practice these strategies through projects they generate individually in their school or in the larger community (p. 12).

From the curricular analysis perspective, such studies as the Citizenship Education at School in Europe (2017) reveal the importance to directly link critical citizenship and environment from a prescriptive point of view. Therefore, the so-called eco-pedagogy (Misiaszek 2015, 2016; Vilches et al. 2016; Kahn 2010) advocates a critical curriculum linking of the teaching and learning of environmental concepts to citizenship education.

However, these recommendations are not always met in curricular materials. The analysis of curricular materials (mainly textbooks) shows how these topics are introduced in the classroom in relation to particular topics and how meanings are presented worked and constructed. Unver et al. (2004) identified gaps in providing information about environmental issues in science textbooks for grades 6–12 in the United States. Other authors found an inadequate promotion of students' involvement in civic participation in selected textbooks for grades 1, 2 and 8 in Chile (Acuna 2015) and the lack of skills development in environmental education textbooks for grades 5–7 in India (Sarmah and Bhuyan 2015).

Even if the concept of Education for Environmental Citizenship is supported in existing guidelines and curricular analysis, it seems to be often neglected in relevant textbooks.

11.4 Education for Environmental Citizenship: Valuable Learning Outcomes at Primary School

After discussing relevant pedagogical approaches and some literature about curricular materials, we focus on what educational goals should be pursued in order to promote Environmental Citizenship in primary school.

11.4.1 Shaping Environmental Attitudes and Values

Raising environmental concern and promoting environmental behaviours should be key educational goals for primary education. Research in environmental sociology and psychology has determined that cognitive and affective measures are important in understanding variations in environmental concern and behaviours (Hansla et al. 2008; Swim et al. 2011; Takahashi et al. 2017). In the specialised literature about environmental education at early ages, the emotional level is represented by shaping children's values and attitudes towards nature. According to Schwartz's theory of universal values (1992, 1994), people accenting values of universalism (as unity with nature, protecting the environment, a world of beauty, social justice and others) tend to prefer more altruistic behaviours than people accenting values of power, achievement or security. While forcing children to accept socially desirable values would be considered as an unethical teaching practice, education for Environmental Citizenship should be able to, directly and indirectly, promote those values to pupils, providing an opportunity for their reflection and consideration.

Affinity with nature, environmental sensitivity and connectedness with nature are frequent concepts in the ecopsychological literature (Cheng and Monroe 2012; Beery 2013; Kals et al. 1999). It is assumed that they form the motivational basis for students' future interest in environmental issues and behaviour (Hungerford and Volk 1990), and so they represent a basic precondition for following-up education for Environmental Citizenship. According to Chawla (1999), frequent, direct and positive experience with nature, together with framing this experience by a reference person (parents, grandparents) valuing nature, plays the crucial role (Kals et al. 1999).

To support this, schools should provide opportunities for pupils to get to the wild and diverse environment during breaks with after-school clubs or residential programmes (Malone and Tranter 2003). An opportunity for unorganised free play in the schoolyard with elements of the 'wilderness', where children may be alone, find their special places and get dirty is important (Sobel 1993; Blair 2009). However, care should be exercised as according to Thomson (2007), adults with a good intention often construct school gardens as a well-organised, safe space, while children perceive their effort negatively as limiting their opportunity to free play.

Therefore, a better approach would be to do things *with* children rather than *for* them. For example, instead of designing a schoolyard for children, do it with them –

invite pupils to participate in planning and reconstructing the school green area (Christidou et al. 2013). This activity may become part of school formal curricula, and it is manageable even with younger pupils. According to Skinner and Chi (2012), perceived autonomy is crucial for pupils' motivation for garden work. In the process of decision-making, they can also develop important competences for active citizenship, such as strategic planning, cooperation with peers or anticipated results of their decisions.

In the Czech Republic, the involvement of pupils in the planning of their school garden is part of the EcoSchool programme. Such a strategy has been applied even in kindergartens. Although some teachers originally questioned the 6-year-old pupils' ability to propose realistic ideas, pupils, being introduced to the age-appropriate method of facilitation, provided suggestions beneficial for both the local environment and their free choice activity in the garden. In addition, the participative approach had a positive impact on their environmental attitudes and feeling of empowerment (Cincera et al. 2015, 2018).

As we could see from this example, formal Education for Environmental Citizenship can be rather student – than teacher-directed. In the above-cited studies, the teacher-directed approach had a lower or even negative effect on students' attitudes and feeling of empowerment.

11.4.2 Skills and Attitudes in Dealing with Environmental Problems

Certain authors maintain that exposing young children to the big, emotionally loaded global environmental problems may lead to 'learned apathy' or 'ecophobia' (Nagel 2005; Sobel 1996). In our opinion, from the age of ten onwards, children are able to individually reflect on sustainability problems in their local environment and in some cases even the global environment. Furthermore, the development of pupils' empathy towards the victims of environmental injustice and providing an opportunity for symbolic help may open a space for follow-up community-based projects in the future.

Such an example is the Global Storylines method that allows pupils to experience various sustainability issues in a safe, play-based environment (McNaughton 2012). However, experience with the Global Storylines also documents the limits of this method. The Global Storylines is based on a method of educational drama play, where, by playing a role, students are confronted with a sustainability issue. For example, students play the role of citizens who must decide if they allow a group of ecological refugees to settle in their village. They are confronted with a risk of water scarcity as a result of increased population and consumption and need to find the best solution for both social and environmental issues.

The method has been implemented and evaluated in a set of Czech primary schools. According to the evaluation, the method proved to have a positive impact

on students' interpersonal competence and on school climate. Pupils repeatedly reflected their empathy towards marginalised or oppressed heroes presented in the role play. However, the impact on their issue awareness or action competence remained limited. One reason was that teachers, concerned with the demands of the method, highlighted its interpersonal level rather than its link to the sensitive issue (Vadurova and Slepickova 2015; Krepelkova 2018).

Again, it supports the importance of a careful, sensitive and age-appropriate approach and not to force pupils into taking bigger steps than they are prepared to.

11.4.3 Ecological Knowledge and Inquiry Competence

While the link between ecological knowledge and behaviour is usually interpreted as weak or non-direct, it is assumed that this kind of understanding may increase the quality of decision (NAAEE 1999; Hungerford and Volk 1990; Hungerford et al. 1980). It is reasonable to propose that students should be able to develop some basic understanding of concepts such as energy flow, food chains and food webs, species interactions and the cycling of materials. These concepts would be preferably learned outdoors either at a schoolyard or as a part of an outdoor residential (a few days long) programmes. As some authors reflect, pupils tend to develop an alternative ecological framework, contradicting scientific concepts (Abdullah 2015). Replacing these frameworks with scientifically more sound concepts may be a challenging and non-straightforward process (Abdullah 2015; Saglam and Ozbeg 2016; Hadenfelt et al. 2016). These environments could also be beneficial for the development of basic pupils' understanding of the nature of science and acquiring basic inquiry skills.

Although this competence seems to be important mainly from the science education perspective, it could form a basis for future environmental literacy-oriented projects. Such an effort is obvious in the GLOBE programme, where students and their teachers participate in data collection and inquiry-based learning activities focused on the analysis of the local environment (GLOBE Czech 2016). While some of the schools limit their involvement with a simple data collection without further analysis (Činčera and Mašková 2009), in other schools, students link their findings with a follow-up community-based action. For example, a group of sixth-grade students from a small school in the Czech Republic analysed data about pollution of a local stream. After the analysis, they organised a collective action to clean it and planned to present their findings to the local municipality.

To link students' investigation with a manageable action outreaching the borders of school provides an important step towards encouraging students to other actions.

11.4.4 Development of Action Competence

In relation to environmental behaviours and key skills for Environmental Citizenship, habits such as energy savings or recycling are worth encouraging and have received high levels of social acceptance. However more general action competences (like cooperation or decision-making skills) are needed to successfully address current environmental problems and the challenges related to an uncertain future (Jensen and Schnack 1997). Cooperation, problem-solving and skills to identify elementary casual links and feedback loops in basic social and environmental systems are key competencies worth developing in this age period, along with the ability to recognise and express values for one's self and others (Wiek et al. 2011).

The most straightforward way for competence development is student participation in real-life projects. Different research across the globe reports on successful experiences when involving primary school students in real-life environmental projects intended at developing their action skills in relation to local issues.

For instance, in the framework of a national programme of education for sustainability in Australia, primary school students worked on a wide variety of projects (planting native reeds at the local lake, creating a community permaculture garden and conducting a trial for a turtle nesting site). Teachers used a specific approach called the 'whole systems thinking' to support students in the development of their projects. Evidence showed that conducting environmental education projects, with an education for sustainability perspective, was an effective, meaningful approach to develop environmental awareness of the whole systems thinking and pupils' social, civic and environmental responsibility for local issues.

Moving from Australia to Africa and in an attempt to build the social capacity to address key environmental issues in Ethiopia, a pilot project was designed to use primary schools as change centres and teachers and students as change agents to bring about positive changes on the biophysical environment. Eleven upper-level primary schools were selected to take part in the dissemination of alternative energy know-how and technologies The results indicated that participating schools attracted the attention of individuals and community-based organisations, engaging them in the demand and use of alternative energy sources, showing that schools could act not only as centres of dissemination of knowledge about environmental but also a place where skills are developed to seek sustainable solutions to these problems (Dalelo 2008).

In Portugal, a qualitative study was conducted to understand the potential of collective initiatives to empower primary school students to take action in relation to local environmental issues. Participants were 26 third grade students and their teachers. The results showed that the students' engagement in addressing the local issues required them to mobilise their scientific knowledge to support their actions, as well as the development of several other competences. Students became aware that acting is crucial to overcome issues that may persist and impact future generations and that only by engaging in action can change take place (Baptista et al. 2018).

However, the age-appropriateness of such a strategy for primary school pupils must be always considered. For example, the Czech programme 'The School for Sustainable Development' is based on principles of place-based education, i.e. linking the school curricula with the local community (Sobel 2005; Stone and Barlow 2005; Smith 2007). In the programme, students from grades 3 to 7 were able to accomplish their projects aiming to improve the local environment (e.g. planting a tree, placing a new bench or dustbin, constructing a table with information about the place). However, they did not deal with any controversial local issues, as the teachers preferred manageable, non-controversial projects that were accepted by the local municipality.

This experience demonstrates the difference between the intended curriculum and curriculum in action – while the programme was presented as issue-oriented, it was delivered in a consensual, non-controversial way. It also documents that engaging primary school learners in dealing with real controversial issues, while recommended strategy for education for Environmental Citizenship (Gruenewald 2008), could bring significant challenges on both students' and teachers' competence and thus required appropriate scaffolding and specific teacher professional development (Reis 2014a, b).

11.5 Conclusion

To summarise, the period of primary formal education is a time for building bases for the further development of Environmental Citizenship competence. We discussed the main learning outcomes related to Education for Environmental Citizenship in primary school and drew on the specialised literature to identify key features of effective educational interventions for promoting active, responsible citizens who are deeply engaged in environmental issues. Finally, we presented several pedagogical approaches with a high potential to integrate those key features and comment on some experiences that provide primary school students with the opportunities to become agents of change in their local communities. However, the successful implementation of educational interventions for promoting Environmental Citizenship at primary school required appropriate approaches and specific teacher training.

A closer look at the specialised literature suggests that further research is necessary to better understand how to support Environmental Citizenship from the early ages.

In particular, we suggest three lines of future work necessary to advance research in the field of Education for Environmental Citizenship:

- Identification of successful educational interventions, effective pedagogical approaches and key designing principles for promoting Environmental Citizenship at primary school

- Effective training and professional development to equip teachers with the knowledge, values, skills and strategies necessary to promote Environmental Citizenship at the primary school level
- Research on the contextual factors supporting or hindering the Education for Environmental Citizenship in formal settings

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Chapter 12
Environmental Citizenship in the Context of Primary Non-formal Education

Jelle Boeve-de Pauw and Rares Halbac-Zamfir

12.1 Features of the Primary Educational Sector

Kellert (2005) identifies three basic stages for children's development of environmental values and actions. Each stage is associated with a specific approach to environmental education (Kellert 2005): (1) *Early childhood* (ages 3–7), sometimes labelled pre-primary education; (2) *early/middle grade school* (ages 7–11), also labelled primary education; and (3) *adolescence* (ages 12–18), labelled secondary education. The cognitive abilities and psychological development of children at these different stages are very diverse. In this chapter we focus on non-formal education for children in the primary ages. Primary education is the second link in most of the formal education systems, and it shares several basic characteristics across the systems. First, it provides basic training, instrumental component of general culture, and second it aims at the development of human personality components: intelligence, curiosity, skills and moral habits, etc. These two features essentialise the main functions of education for children between the developmental ages of 6 and 12 years old. First, there is the function of achieving basic education by lowering the age of retraining and including it in a system of organised and coordinated education in scientific humanities. Second, there is its function of developing the personality of the child and respecting their own capacities, which implies both the individualisation of education and the promotion of formative education (or Bildung; Biesta 2015).

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Reformations of early and primary education based on the Geneva Declaration of the Rights of the Child (UNICEF 1990) have led to redefining the goals that it pursues. We mention below those we see as being relevant discussion points in relation to Education for Environmental Citizenship.

1. Primary education should foster a free, complete and harmonious development of the child's personality according to its own pace and needs and support its autonomous and creative learning and development.
2. Primary education should develop the ability of children to interact with other children, adults and the environment, and to acquire new knowledge, skills, attitudes and behaviours. It also needs to encourage explorations, exercises, trials and experiments, all as autonomous learning experiences.
3. Primary education should contribute to each child's discovery of its own identity, autonomy and the development of positive self-image and support the child in the acquisition of the knowledge, skills, habits and attitudes necessary for them to enter school and lifelong learning.

As we will debate later in this chapter, non-formal education presents a unique educational context in which children's environmental identities (see, e.g. Clayton 2003) can be developed and where they can acquire the competences needed to become Environmental Citizens.

12.2 Non-formal Education for Environmental Citizenship

12.2.1 Defining Non-formal Education

Our aim in this chapter is to explore how non-formal education can take place for young children as a space to experiment with and learn the competences needed to become an Environmental Citizen. Before doing so, it is only fair that we explain how we interpret the term 'non-formal education'. In line with Norland (2005), we acknowledge that 'any term beginning with "non" can be perceived as somewhat negative or even disagreeable: non-communicative, non-responsive, non-productive' (p. 6). Non-formal education should not be perceived as the lack of something, but rather as an educational context with unique qualities. The concept emerged in the international discourse on education about 40 years ago. It is associated with the idea of lifelong learning and emphasises the importance of education going beyond the formal frameworks of the education system, whether in educational spaces other than school, or through education activities that are not subject to the school curriculum but that respond to the needs and interests of a group's knowledge and development.

The value of non-formal education arises because the formal education system is adapting too slowly to the socio-economic and cultural changes of the world in which we live. Non-formal education is different from formal education, both in

content and through forms of achievement. Course content is organised within areas of interest (not years of study or academic subjects) and is very diverse in terms of duration, organisation or teaching. Non-formal education can be characterised by concrete responses to fixed requirements, clearly defined interests, obtaining abstractions by extracting knowledge from practical life, minimising teaching functions, and leaving more room for learning. Non-formal could as such be defined as the absence of something formal, and non-formal education could then be interpreted as the absence of formal education. We argue that the absences of the frameworks and structures of formal education are strengths of non-formal education, especially when it comes to Education for Environmental Citizenship. Indeed, non-formal learning provides an opportunity for education to rely on the natural process of learning, by allowing it to be active, volitional and internally mediated (Heimlich 1993).

In line with Norland (2005), we contrast dimensions of education in the formal and non-formal sphere in Table 12.1.

12.2.2 Non-formal Primary Education and Environmental Citizenship

Fordham (1993) points out that, in the case of non-formal education, organisation and learning planning should be assumed by the learners themselves; as such, a 'bottom up' approach is necessary in order to give learners the ability to understand or not to change the surrounding social structures. This participatory principle, which underpins the non-formal philosophy, should be understood as participation in self-training (understanding needs and finding appropriate training solutions in the respective fields) and in the life of the community/society. Moreover, in the case of non-formal education, it should be negotiated by the trainees group so as to respond to their needs as best as possible. One of the specific directions of non-formal education is to support the population for more rational use of natural resources.

Table 12.1 Characteristics of formal and non-formal education programmes

Dimension	Formal	Non-formal
Focus	Emphasis on teaching	Emphasis on learning
Curriculum	Sequential prescribed curriculum	Variety and flexibility, often determined by the learners
Relationships	Teacher-student, often hierarchical	Facilitator-learner, often informal relationships
Resources	Often originate at (member) state level. Typically high costs	Often local and limited. Typically low costs
Time orientation	Future	Immediate
Structure	High structure typically required	Low structure often desirable

The extent to which these principles also hold for (young) children is subject to debate and research, but there is some evidence that allowing children to co-decide on what on how they learn about and for sustainability, has a direct impact on their sustainability consciousness (Boeve-de Pauw et al. 2015). As such, participatory learning for children in primary schools seems to contribute to the development of competences that pave the way for them to develop into Environmental Citizens. It should be noted that in their study, Boeve-de Pauw et al. (2015) also showed that students in secondary education had increased participation in their own learning process (which meant an increase in learning sustainability learning outcomes), but for students in primary education (grade 6 in particular), there seemed to be a point of too much participation, resulting in a decline in the learning outcomes. The authors identified 'that learning environments with (among others) very high degrees of participation in the learning process might be too demanding, cognitively complex, or contain to high degrees of novelty for sixth graders […], which could explain the resulting drop in the [educational] effectiveness [promoting their adoption of sustainability related actions]' (p. 15710).

We should acknowledge that these results stem from research in the context of formal education. This is especially relevant when we consider Environmental Citizenship as an outcome of non-formal education. Younnis (2011) highlights that extra-curricular activities are essential in encouraging civic identity and action. Given the focus of Environmental Citizens on 'responsible pro-environmental behaviour of citizens who act and participate in society as agents of change in the private and public sphere, on a local, national and global scale, through individual and collective actions, in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability as well as developing a healthy relationship with nature' (Hadjichambis & Reis 2018). We therefore use the term non-formal Education for Environmental Citizenship as an education that occurs outside the classroom, e.g. in after school programmes, community-based organisations, museums, zoos, visitors centres, libraries and at home, and which contributes to learning specific or all competences needed as an Environmental Citizen.

We also highlight four relevant characteristics that can help define non-formal programmes in the realm of Education for Environmental Citizenship. Each of these characteristics offers opportunities that can benefit the goals of Education for Environmental Citizenship. We also focus on the development of a healthy relationship with nature.

1. The purposes of the programmes are not always uniformly or solely educational. Providers of such programmes may also embed goals that are non-educational but social or recreational.
2. The target audiences are diverse and can include school classes, other groups, families and walk-in visitors. Participants in non-formal environmental learning programmes are not often well known, and it can be difficult to describe the audiences in ways to facilitate programme development specifically for the target audience.

3. The duration of learners' participation or exposure to the programmes varies widely. It can range from a visit of about 2 h to full day or residential programmes where learners sleep over at environmental sites and engage in non-formal learning for up to a week or more.
4. Non-formal education programmes are typically developed and offered by organisations other than traditional education institutions. Often the programme is developed collaboratively between multiple organisations from the public, non-profit and private sectors.

In conclusion, non-formal learning occurs in a planned but highly adaptable manner in institutions, organisations and situations beyond the sphere of formal education. It shares the characteristic of being mediated with formal education, but the motivation for learning may be wholly intrinsic to the learner (Eshach 2007). For the development of Environmental Citizenship, non-formal education is highly relevant given its potential to prompt the learning of skills, knowledge and other outcomes in addition to formal learning (Lockhart 2016). It also provides the flexibility to adapt to rapidly changing expectations and societal needs. For these reasons we agree with Romi and Schmida (2008) in labelling non-formal education as a major educational force and highlighting its added potential on top for formal Education for Environmental Citizenship. Examples for programmes that offer non-formal education for environmental citizenship and have been studied empirically are the US Earthkeepers programme (also implemented and in, e.g. Cyprus; Van Marte and Johnson 1988; Manoli et al. 2014), environmental museum visits (e.g. at the Natural History museum; Kimble 2014), place-based environmental programmes (e.g. in the Czech Republic, Cincera et al. 2014), educational visits natural areas (e.g. the educational programmes by the Province of Antwerp in Flanders, Belgium; Boeve-de Pauw et al. 2019), extra-curricular forestry education (e.g. in Mexico; Ruiz-Mallen et al. 2009), etc.

12.3 Children Can Learn to Become Environmental Citizens

12.3.1 Children Are Not Adults

A problem that might occur in non-formal environmental education programmes that target children in primary education is that they approach education and citizenship competences from the perspective of an adult, rather than from that of a child. Education for Environmental Citizenship should, especially for children of primary school ages, treat children as children and not as adults. Furthermore, EEC should attune itself to appropriate levels of abstraction in teaching and learning. Teaching children about nature abstractly in the classroom does not lead to pro-environmental behaviours in later life (Schultz 2000). Teaching abstract concepts like habitat destruction, acid rain, holes in the ozone layer and whale hunting to

young children can even lead to dissociation from nature and premature abstraction (e.g. White and Stoecklin 2008; Ausubel 1964).

Hayward (2012) states that 'as educators, parents and policy makers, we need to pay closer attention to complex interactions of the micro- and macro-level changes taking place in a child's environment […] we rarely take the complex ecological reality of a child's world seriously' (p. 3). Children's ecological reality is a complex series of nested interactive systems providing daily dynamic experiences with diverse impacts at the micro and macro level of their lives and their surrounding environment. These experiences are generally approached within a scientific framework (environmental sciences), without considering primary education level features and the need to translate the results of these experiences at a level easily understood by children. The language of environmental sciences has not yet been adapted to a primary education level, missing the fluidity so characteristic for this age.

When we present children with problems beyond their cognitive abilities, understanding and control, they can 'become anxious, tune out and might develop a phobia to the issues. In the case of environmental issues, biophobia—a fear of the natural world and ecological problems—a fear of just being outside—can develop' (White and Stoecklin 2008; Barbiero and Marconato 2016). These principles should be taken into account by the Education for Environmental Citizenship since it aims to foster environmental agency in children through teaching and learning for Environmental Citizenship. Studies on the loss of rainforests and endangered species may be perfectly appropriate for adolescent or older children, but it is developmentally inappropriate for younger children (Wilson 1993; Kellert 2002). We also need to be aware that the citizenship aspect of EEC, which includes a strong call for action to contribute to solving major complex issues, is cognitively too demanding for children under 12 years old. Messages for action as well as the problems they intend to solve need to designed or appropriated to the abilities and needs of children. Furthermore, teaching children by using virtual nature or exotic places that are by definition not part of their real life experiences can result in them developing a conception of nature that diminishes the value of their own local natural environments. As such, this reduces their potential to develop an internalised call to protect those areas (see, e.g. Levi and Kocher 1999), or to develop Environmental Citizenship based on their experiences with action for their own local (natural) environment.

12.3.2 Social Practice Theory and the Formation of an Environmental Identity

Social practice theory suggests that people develop their identities in different facets of their lives, as they respond to their environment and adopt the practices (and as such possibly also the environmental actions) of others around them (Williams and

Chawla 2016). One of these facets of identity development is what Kempton and Holland (2003) term a 'social environmental identity': people's self-definition relative to an environmental reference group. This could be a general identity such as 'environmentalist' or a membership to an environmental group. The goal of Education for Environmental Citizenship is to 'cultivate a coherent and adequate body of knowledge as well as the necessary skills, values, attitudes and competences that an Environmental Citizen should be equipped with in order to be able to act and participate in society as an agent of change […] in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, in achieving sustainability as well as developing a healthy relationship with nature' (Hadjichambis & Reis 2018). People are not likely to take action for the environment unless they incorporate improving their environment (and the natural environment) into their identity (Tesch and Kempton 2004).

As identified above, non-formal education from the ages of 6–12 years old holds great potential in supporting and building such an identity. According to social practice theory, people build their identities in the course of action, i.e. while performing and living actions, and from experiencing the impact of those actions on their environment as well as on themselves. Therefore, researchers in social practice theory look for pivotal moments in people's identity formation across their entire lifespan. As people's sense of self as agents of change (Hadjichambis & Reis 2018) grows, three specific changes occur which should be taken into account when designing educational interventions that connect to EEC:

1. There is an increasing salience to the natural world by becoming more attentive and knowledgeable, and being more aware of environmental problems.
2. There is growing identification with the world of environmental action, by acquiring a sense of agency for taking responsibility for action, and caring about the consequences of one's own actions.
3. People would gain knowledge through action; people can learn about practical activities associated with environmental action and become acquainted with a strategic network of other actors.

Thomashow (1995) defines an ecological identity as 'all the different ways people construe themselves in relationship to the earth as manifested in personality, values, actions, and sense of self'. He notes that 'The interpretation of life experience transcends social and cultural interactions. It also includes a person's connection to the earth, perception of the ecosystem, and direct experience of nature' (p. 3). Similarly, Clayton (2003) defines an environmental identity as 'one part of the way in which people form their self-concept: a sense of connection to some part of the nonhuman natural environment, based on history, emotional attachment, and/or similarity, that affects the way in which we perceive and act toward the world' (p. 45–46).

Clayton (2003) also states that environmental identity is a strong motivating force for individuals to act in ways that protect the environment. In turn their identities will guide social, political and personal behaviours such as those actions identified in the definition of Environmental Citizenship (Hadjichambis & Reis 2018).

According to self-determination theory (Ryan and Deci 2003), identities serve 'basic needs' including a sense of belonging, sense of competence and autonomy. Identities become strong when they meet these important needs. Although the questions concerning identity may become central during adolescence, social practice theory puts that people begin to learn what society expects of them already in early childhood, and as such children already develop personal responses to those expectations. Social Practice Theory merges a personal identity that involves personal goals, values and beliefs with a cultural identity or sense of belonging to a social and cultural group (Williams and Chawla 2016), and identifies middle childhood as an essential phase in the development of such identity. It is therefore very relevant to explore what kind of experiences can contribute to the formation of an environmental or ecological identity during this phase in human development. These experiences can be used to foster Environmental Citizenship through targeted non-formal EEC.

12.3.3 Significant Life Experiences That Contribute to the Formation of an Environmental Identity

Research concerning significant life experiences aims to uncover which events in one's history have been so impactful that they are experienced as pivotal in the formation of their motivation to act for the environment and can as such be described as defining moments in the formation of Environmental Citizenship. This line of research has a long tradition (Tanner 1980) and consistently shows that participants across the globe attribute their commitment to environmental action to a common set of experiences. They span spending time outdoors and experiencing nature during (early) childhood, the influence of parents and other family members, influential teachers at school, active involvement in community life, reading eye-opening books or seeing documentaries and experiencing the loss or degradation of nature in the vicinity of one's personal life (Chawla 2009).

Numerous studies have shown that non-formal learning experiences in nature during childhood are ranked among the most powerful and significant life experiences. Children's experiences during (early) childhood nurture the conception of the child as a part of nature, of including nature in its conception of the self (Cheng and Monroe 2012) and the development of an environmental identity. It is during childhood when children's experiences give form to the values, attitudes and basic orientation toward the world that they will carry with them throughout their lives (e.g. Kahn 2002). Regular positive interactions with nature allow children under 12 years old to feel comfortable, develop empathy and grow to love it (e.g. Gill 2014). Cheng and Monroe (2012) identify several key elements associated with children's connection to nature: enjoyment of nature, empathy for creatures, sense of oneness and sense of responsibility. This last factor includes children's notions of the impact of their own actions on the natural environment and their rights and

duties to protect nature and is as such closely connected to the ENEC definition of Environmental Citizenship.

In significant life experiences research, formal education is consistently ranked high but lower than non-formal education. Also the social context with which these experiences occur is important. Participants often report that their own commitment to act for the environment has sprouted from inspirational role model in their families or peer groups. Thanks to their flexibility in organisation and intended outcomes, non-formal education programmes can be considered as promising. With these programmes, young children and preadolescents can develop into role models for Environmental Citizenship and inspire their peers. In their study on the environmental literacy of youth movement members, Goldman et al. (2015) show how self-perception as role models for younger members on environmental actions is part of their social activism. Inspiring teachers are at a cross section between formal education, the social context and non-formal education.

The relative importance of these diverse formative experiences is not constant over time, but rather it changes as children grown into adolescents and later become adults. In studies on significant life experiences, participants highlight experiencing nature and role models during childhood, teachers and peers during adolescence and participation in activities from environmental organisations and workplace experiences during adulthood (Chawla 1999). Table 12.2 gives an overview of the most formative experience during different periods in life.

Building in possibilities into non-formal education programmes for children to experience such significant life experiences strengthens the formation of environmental identity and could cascade into Environmental Citizenship. Many non-formal environmental education programmes take place in or close to natural areas. Yet being close to nature is insufficient if we have the ambition to facilitate children to form an environmental identity solely based on experiencing nature. Non-formal educators should therefore capitulate on allowing children to play in nature and contribute – at their own level – to the conservation or restoration of nature (e.g. Kellert 2002). Examples of outdoor learning activities and their facilitating role in

Table 12.2 Formative experiences ranked from most to least important at different stages in development

Childhood	Adolescence	Adulthood
Experiences in nature	Formal education	Organisations
Family role models	Friends and peers	Workplace experiences
Formal education	Social (in) justice	Friends and peers
Organisations	Organisations	Books and authors
Negative experiences with nature (habit loss, pollution)		Negative experiences with nature (habit loss, pollution)
Social (in)justice		Philosophy of life

the construction of environmental citizenship are described in recent publications such as those produced by Ferreira and Pitarma (2018) from Portugal.

12.3.4 From Experiencing Nature to Agency for the Environment

The features of non-formal education allow this system to focus on learning environments, which can be perceived as spaces where children will engage in experiences possibly to be seen as 'ecological identity works' (Thomashow 1995). Being exposed to a wide range of experiences and perspectives, engaging in discussions based on an adapted vocabulary and at an developmentally appropriate level of abstraction, are a crucial elements in developing children's environmental identities. Ideally, the development of an environmental identity should be essentially concerned with an understanding and appreciation of the environment and the significance of the natural order through a dialogue between place and self (Bonnett 2013). Chawla and Flanders-Cushing (2007) go forward and set up a link between environmental identity and Environmental Citizenship, stressing that education provided in a non-formal environment will contribute to environmental identity development, which is necessary to produce both active citizens and embed democratic principles within the education process.

Next to developing an environmental identity, children also need to develop a sense of efficacy for the actions they undertake. Bandura (1997) puts forward that a sense of agency (whether it be to contribute the solving environmental issues or in any other domain) already begins during infancy, in the recognition that actions produce outcomes and that these outcomes can be attributed to a developing identity. This way children discover that they are able to produce interesting and useful effects. Chawla (2009) illustrates that natural environments are filled with opportunities for competence and agency-building opportunities. She describes how natural areas are 'full of materials that enable children to produce pleasurable effects, such as water to splash, mud to meld, branches to swing on, and stick and stones to construct forts and huts' (Chawla 2009, p. 15). Natural places also present plenty of opportunities to experience new levels of agency, and they are usually beyond the adults' direct control. Children learn agency in these rich and stimulating environments, and their learning is not directed by goals set by adults, such as teachers within the formal education system. Such experiences build a child's healthy relationship with nature and therefore make an unmistakeable contribution to the development of Environmental Citizenship. Inspiring examples of educational interventions in the non-formal sphere can be found – for example, – in the New Zealand publication 'Effective approaches to connect children with nature' (Wilson 2011).

Bandura (1997) also describes how children develop a sense of efficacy for their actions through mastery experiences when they attempt to do something that they

consider significant and when they experience success. This is an essential ingredient for non-formal education programmes to aim to foster Environmental Citizenship in children. Malone (2013) explains how positioning children as active agents of change in non-formal learning programmes (focused on designing a child-friendly neighbourhood) led them to recognise their sense of connectedness and stewardship for the local environment and their sense of responsibility to the planet.

In conclusion, Environmental Citizenship is a highly complex and multifaceted concept that includes knowledge, attitudes, values and actions; children need opportunities to learn and practice these action skills and experience that their actions for the environment can be successful. Non-formal education that facilitates the formation of an environmental identity and that presents children with opportunities to experiences mastery at their developmental level paves the way for them to develop Environmental Citizenship.

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Chapter 13
Environmental Citizenship in Secondary Formal Education: The Importance of Curriculum and Subject Teachers

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13.1 Curriculum Principles and Environmental Citizenship

Teachers in formal secondary schools always teach based on the curricula of a school subject. In some countries they teach only one subject, in other countries perhaps two, three or even four. For instance, English science teachers are required to be able to teach biology, chemistry and physics to students aged 11–16. Overall, secondary schoolteachers are considered to be subject specialists, and their teaching is steered by what the formal curricula prescribes. The curricula of secondary school often consist of a general section that all teachers are obliged to follow and the

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curricula or syllabi that prescribe what should be taught in each specific school subject. The issue of interest then, if we want to enact Environmental Citizenship in formal secondary education, is to identify instances within the curricula that cover the topics, teaching approaches and aims of Education for Environmental Citizenship. If it isn't included in the curriculum, Environmental Citizenship will most probably not be addressed by the teachers. In this chapter we will show how aspects of Environmental Citizenship are pinpointed in policy at a European level, and also give examples of the national curriculum in some countries.

Young and Muller (2010) identify two main trends or traditions in curricula development over the last decades. These traditions are extrapolated as trajectories into possible futures, denoted Future 1 and Future 2. According to Young and Muller (2010), a Future 1 perspective is characterised by a disciplinary content-driven curriculum where assessment is a focus. A problem with this curriculum principle is that it does not provide students with the knowledge to tackle complex problems of today's society (Young 2015). However, the Future 2 perspective suggests integrating school subjects, promoting generic skills and facilitative teaching. This perspective focuses on phenomena instead of concepts, which might be more relevant from a student's perspective but could lead to insufficient disciplinary knowledge to fully understand the phenomena according to Young (2015). To which trajectory does then Environmental Citizenship and Education for Environmental Citizenship relate? As can be seen in the chapters of this book, we would claim that it is more in line with a Future 2 tradition, i.e. Environmental Citizenship is focusing on environmental, economic and social issues of society, and the goal is to empower students as Environmental Citizens, with generic skills to enable them to counter environmental degradation.

Environmental Citizenship as an overarching construct, as outlined in this book, can often be found in the central goals of education, i.e. in the general curricula as a Future 2 perspective. Studies have shown that secondary teachers, in some countries at least, tend to focus on fulfilling the goals of the syllabi rather than looking at the overarching curricula that informs syllabi (Sundberg 2005). Hence, this could be one of the first hurdles or barriers to overcome if aspects of Environmental Citizenship are already part of the general curriculum. How can we support secondary schoolteachers to look beyond the core content of their subject syllabi so as to also address more general goals related to environment, sustainability and citizenship? Moreover, the disciplinary tradition of in-service teacher education programmes has been found to influence teachers to a high degree. In that way, the teaching approaches and selection of content relate to more traditional teaching rather than the progressive teaching approaches as suggested in environmental and sustainability education (Borg et al. 2012, 2014; Stables and Scott 2002). Hence, Education for Environmental Citizenship pedagogy that builds on student competencies for civic participation, contributing to environmental and social change, could be expected to render more resistance when implemented at secondary school in comparison to primary school.

A way to ensure that Education for Environmental Citizenship is addressed within formal education at the secondary school level is to include Education for

Environmental Citizenship within existing school subjects. A school subject usually originates from a university discipline. Biology and mathematics are two typical examples of this. In contrast some school subjects do not exist at the university level; they are constructed for school to meet some important knowledge domains of society that do not stem from one discipline alone (Gericke et al. 2018). Civics, for example, is a subject that stems from both political science and national economy at university level. Another is natural science, a school subject that is taught in many countries drawing from biology, chemistry, physics and geoscience. Hence, finding aspects of Environmental Citizenship in different school subjects will illustrate different problems and/or opportunities, depending if the school subject is a 'miniature' of the disciplinary subject or if it is a construct of the school system, which inevitably will give more possibilities to include Environmental Citizenship perspectives from a Future 2 tradition. Another solution is to let Environmental Citizenship take the form of a specific subject in itself, but this requires political decision-making, and in most countries, it is a long-term goal.

Another aspect of secondary schooling is that lower secondary education in many countries is part of the compulsory school system aiming to foster literate citizens, while upper secondary schooling is voluntary and preparatory for further studies or a profession. If we use the categorisations of school aims developed by Biesta (2015), lower secondary school could be seen to aim at socialisation (to be able to understand and act within social practices), and subjectification (to be able to understand and create meaning), while upper secondary school aims at qualification (to be able to qualify for a further professional life). Hence, it will probably be easier to implement Education for Environmental Citizenship in lower secondary school because socialisation and subjectification are more in line with a Future 2 education. However, we need to stress that these are assumptions and could vary considerably depending on the country and the school system. In the following sections, we will elaborate on these issues.

13.2 Environmental Citizenship in Policy and Curriculum

Environmental Citizenship has been a constantly contested and evolving concept in multiple disciplines for decades (Pallett 2017). However, in recent years Environmental Citizenship has in fact become an integral element of civic and citizenship education curricula, both globally and at the European level (CoE 2018; Schulz et al. 2016). Most education systems in democratic societies have rather similar objectives of citizenship education, and in that, future citizens would be able to (i) interact effectively and constructively with others; (ii) be critical thinkers; (iii) act democratically; and (iv) act in a socially responsible manner. These objectives to a large extent relate to the socialisation goals of education (Biesta 2015). Hence, Environmental Citizenship at a curricular level follows the trajectory of a Future 2 perspective and can be seen as a response from the educational system to accommodate curricula due to changes in society.

Out of the 42 national and local education systems existing in Europe, environmental protection is included in citizenship education curricula. This is used to build the student competence relating to 'acting in a socially responsible manner' in 21 systems at lower secondary education level, in 20 systems at upper secondary education level and in 19 secondary vocational education systems (European Commission/EACEA/Eurydice 2017). In most European education systems, citizenship education is taught integrated into other compulsory subjects except where citizenship education is taught as a separate compulsory subject in schools. At the same time, environmental activities for environmental awareness are on the rise among the top-level recommendations for extracurricular activities in 22 education systems at the secondary education level (European Commission/EACEA/Eurydice 2017). One conclusion is that if Environmental Citizenship is to be implemented in secondary formal schooling, it needs to be done through the curricula of many different school subjects and enacted by subject specialist teachers. This issue is at the centre of this chapter, and we will revisit this later on.

Another issue of concern is the importance of school organisation and school culture for including Education for Environmental Citizenship in secondary education (Fullan 2001). Previous studies on school leader perspectives concerning quality education in relation to education for sustainable development have identified four key factors that School principals recognise in order to achieve a transformation of education (Mogren and Gericke 2017):

First, collaborative interaction and school development, i.e. recognition that school development is an ongoing process where all the teachers and other co-workers of the school must actively participate.

Second, student-centred education, i.e. organisation of the education in alignment with students' needs, recognising that a good relationship between teachers and students is a sign of quality.

Third, cooperation with local society, i.e. recognition of the need for school organisations to cooperate with the local and global society.

Fourth, proactive leadership and continuity, i.e. a leadership style based on collective learning, implemented through the gradual progression of far-reaching plans.

Furthermore, it has been shown that it is important to have a common holistic vision between school leaders, teachers and students at the same school in order to transform education towards environmental and sustainable aims (Mogren et al. 2019).

In contrast, there are rather large discrepancies between school leadership, teachers and students on the view of how to implement environment citizenship education. The latest results from the international civic and citizenship education study (ICCS in 2016) in 24 countries (including 16 European countries) show that about one third (38%) of school leaders consider 'promoting respect for and safeguarding the environment' as one of the most important aims of civic and citizenship education, while more than half (51%) of the teachers agreed (Schulz et al. 2017).

However, these numbers show a significant increase from previous results (ICCS in 2009) in 38 countries (including 24 European countries) where 31% of school leaders and 41% of the teachers considered 'promoting respect for and safeguarding the environment' as one of the most important aims of civic and citizenship education (Schulz et al. 2010). Among the European countries, we find that teachers and school leaders in Finland and Malta have the highest international average for the aim of 'safeguarding the environment', the most important aim of citizenship education, while those in Denmark, Estonia and Norway have the lowest.

School leaders have reported that a range of environmentally friendly practices have been adopted in their schools globally and across Europe (Schulz et al. 2017). Regarding differential waste collection practices, many students in Slovenia (99%) and Belgium (95%) reported upon such practices, while fewer students in Netherlands (51%) and Estonia (55%) reported the same. The variation between countries outside Europe is also large. In Taiwan, all of the students (100%) report this practice, while the numbers in South America are under average for the study as a whole, i.e. Chile (30%) and Mexico (59%). In recognising that their schools have systems for waste reduction, students in Taiwan (99%), in Slovenia (99%) and in Finland (96%) exercised this practice, with only 26% in the Netherlands, 38% in Denmark and 42% in Chile recognizing likewise. Regarding the issue of purchase of environment-friendly items, students in Taiwan (99%) and Slovenia (88%) reported the most frequent use of such practices, while only 34% in Chile and 37% of students in Netherlands reported likewise. Regarding the issue of communication, as high as 99% in Taiwan, 89% in Mexico and 95% of students both in Lithuania and in Slovenia are studying at a school where information posters that encourage students' towards environment-friendly behaviours are visible, while only 27% of students in Netherlands and 39% of students in Sweden experience the same environmental communication in schools. From these examples, we can see that various countries globally and in Europe have very different school cultures relating to these issues, making the possibility for implementation of Education for Environmental Citizenship look very different depending on country and school culture.

The need for professional development in relation to Environmental Citizenship and Education for Environmental Citizenship is large, but also varies considerably between countries. Such professional development training seems more common in countries outside Europe; about 86% of teachers in Taiwan, 82% in Colombia and 76% in Mexico report such training, while, for example, only 41% of teachers in Belgium and 28% of teachers in Croatia have reported the same. Surprisingly though, over 80% of teachers of all countries feel confident in teaching subjects related to the environment and sustainability (Schulz et al. 2017). This contrasts quite heavily with other studies and countries where teachers often report a lack of experience and confidence (Borg et al. 2012).

In teaching practices of citizenship education, around 10% of teachers in all the participating countries have taken civic action-related initiatives with their students of 'writing letters to the newspapers or magazines to support actions about the environment', 'signing a petition on environmental issues' and 'posting on social

network, forum, or blog to support actions about the environment' (Schulz et al. 2017). In secondary schools of countries from the Southern Hemisphere, e.g. Colombia (20%), Mexico (21%) and Peru (31%), such teaching activities were found to be much more commonly reported then in many European countries, e.g. Belgium (3%) and Sweden (3%). Other more traditional teaching activities, to raise students' awareness of the environmental impact of excessive water and energy consumption, were however practiced to a similar degree in all countries and on average reported from 48% of the teachers (Schulz et al. 2017).

Many teachers in citizenship education seem to have a preparedness for Education for Environmental Citizenship, though they still are a minority of all teachers. This is also supported by school leader reports that claim that on average 61% of students in schools of the 24 participant countries of ICCS have participated in activities related to the environment or sustainability during a school year (Schulz et al. 2017). This view is reinforced by the fact that a majority of students (average 84% in 2009, and 86% in 2016) across the globe consider 'taking part in activities to protect the environment' as an important element of being a good adult citizen (Schulz et al. 2010, 2017).

In the following sections, we will go from the international level to three countries, England, Croatia and the Netherlands, and investigate the conditions set by the local curricula and school systems for implementing Environmental Citizenship and Education for Environmental Citizenship in formal secondary education. This way we will exemplify the possibilities and possible barriers for accomplishing this goal.

13.2.1 The Case of England

In England, Environmental Citizenship at secondary school level is not a concept that is explicitly addressed in the statutory requirements of the National Curriculum (NC) for Key Stage 3 (11–14-year-olds) and Key Stage 4 (14–16-year-olds). Instead, aspects of Environmental Citizenship are addressed through various subjects separately, mainly Science, Citizenship Education, and Geography. At Key Stage 4 (the last 2 years of formal schooling) under the tenet of 'Working Scientifically' (the section of the NC that outlines the scientific attitudes and skills that should be used and promoted through the subjects of Biology, Chemistry and Physics), students are expected to develop their scientific thinking skills of explaining everyday and technological applications of science; 'evaluating associated personal, social, economic and environmental implications; and making decisions based on the evaluation of evidence and arguments' (DfE 2015). This indirect curriculum focuses on the socioscientific issues and argumentation that shares common characteristics with Education for Environmental Citizenship. They both emphasise the need to consider the implications and applications of scientific knowledge to the environment and the actions needed in order to address them.

The subject of Citizenship Education focuses on developing students' knowledge and skills on a sociopolitical level so as to be able 'to take their place in society

as responsible citizens' (DfE 2013a, p 1). For instance, students at Key Stage 4 (15–16 years old) should learn about 'the different ways in which a citizen can contribute to the improvement of their community, to include the opportunity to participate actively in community volunteering, as well as other forms of responsible activity' (DfE 2013a, p. 3). As Dobson (2007) discusses, aspects of Environmental Citizenship could be addressed through an Ecology or Environmental Citizenship lens. After the specification of Citizenship Education in 2013 was revised, more emphasis was placed on the subject of Citizenship Education from a political point of view, which mainly focused on students' understanding of 'democracy, government and the rights and responsibilities of citizens' (DfE 2013a, p. 2). With that, there is no direct mention of environmental issues or sustainability, although the active involvement and consideration of communities is explicitly considered. Perhaps closer to the aims of Education for Environmental Citizenship is the Geography specification for Key Stage 3, which states that students should 'understand how human and physical processes interact to influence and change landscapes, environments and the climate; and how human activity relies on the effective functioning of natural systems' (DFE 2013b, p. 2). However, since Geography is a non-compulsory subject, these opportunities are restricted to those students who choose to study it for their end-of-school exams (GCSEs). Furthermore, in the three subject specifications described in this section (Science, Citizenship Education, Geography), the combination of Environment, Citizenship and Action is not a concurrent requirement. As Glackin and King (2018a) emphasise, students are given few opportunities through curricula such as Science and Geography to be actively engaged and involved in environmental improvement. In their recent review of the state of environmental education in secondary schools in England, Glackin and King (2018b) point out that the place of environmental education is weak in current national policies in England, both from an ideological and structural perspective, which makes environmental education and Education for Environmental Citizenship much more challenging to implement within the English secondary school context. On the other hand, this points out the importance of inclusion of Education for Environmental Citizenship in the educational efforts.

As noted in Sect. 13.1, the fact that Environmental Citizenship is not an explicit component of a particular subject's curriculum makes it more challenging for secondary schoolteachers to address it in their teaching in England. This is due to a range of restrictive factors, which could include time, as well as the teachers' own subject knowledge of the related issues. For instance, if a citizenship teacher wished to address Environmental Citizenship dimensions, they would most likely need to have some understanding of scientific processes and science subject matter. Finally, education at Key Stage 4 is strongly framed based on qualification (Biesta 2015) with an increasing emphasis placed on the examinations students take at this stage, which can determine their post-compulsory education routes. This in combination with the emphasis placed on subject knowledge acquisition within environmental education currently (Glackin and King 2018b) means that fewer opportunities exist for the cross-curricular educational activities that would be required at the secondary school level for Education for Environmental Citizenship to be implemented.

13.2.2 The Case of Croatia

When discussing Environmental Citizenship in secondary formal education and its implementation in Croatia, it is necessary to first describe how secondary education is organised. In Croatia, after 8 years of elementary school, children attend secondary school at the age of 14 or 15 and stay 4 years until they are 18 or 19 years old. Secondary schools in Croatia are divided into gymnasiums, vocational schools and art schools. Education in gymnasiums lasts 4 years. There are four available educational programmes: general (covers general education), science-mathematics (mathematics, informatics and science), classical (classics, Latin and Ancient Greek) and language (similar to general, but more oriented to foreign languages). Gymnasiums prepare students for tertiary education, and do not qualify students for a particular profession. Vocational schooling lasts 3 or 4 years, depending on the programme, and qualifies students for a particular profession. Art school takes 4 years to complete and aims to educate students in art and music. This school will not be addressed in this chapter because no subjects relating to Environmental Citizenship is taught in that programme. As can be seen from this summary, secondary education in Croatia is mostly framed from a qualification perspective (Biesta 2015) where the aim is to prepare the student for a profession or further study.

In the curriculum of secondary formal education in Croatia, Environmental Citizenship and Education for Environmental Citizenship are not used as specific terms. However, the curriculum of gymnasiums and vocational schools includes some courses and/or subjects that correspond to Environmental Citizenship and Education as Environmental Citizenship (NCEEE 2015). Similarly to the case in England, Environmental Citizenship is mostly part of the subject curriculum of Biology, both in gymnasiums and vocational secondary schools. Some aspects of Environmental Citizenship are also present in the Geography curriculum. However, some vocational secondary schools also include environmental education within some other subjects.

Within the gymnasium's curriculum in Biology, environment education is taught in fourth grade (last grade of the gymnasium). Students learn about ecology and the possibilities of the advancement and improvement of environmental protection. In geography, students learn about environment at the end of second grade after topics on demography, urban geography and economics. Furthermore, students learn about the interrelationship between human (and economic) activities and the environment. The basic difference between environmental education in biology and geography is the perspectives used: in Biology, the environment is presented through an ecosystem perspective, and in Geography through a spatial perspective. In both subjects, students are being educated about necessity of environment protection and how to be a responsible, pro-environmental-oriented citizen. Previously mentioned curriculum is valid for all gymnasium programmes. In the gymnasium programme of Science-Mathematics, Biology is being taught more extensively with practical training that is more in line with Education for Environmental Citizenship. Moreover, in Science-Mathematics gymnasiums, Ecology is offered as an optional subject where students are additionally educated about the environment and its importance in today's world.

There are many various vocational secondary schools in Croatia, and Biology is usually taught for one or two years in these schools. In vocational secondary schools where Biology is taught for one year, Environmental issues are also being taught depending on a module that is officially valid in certain vocational school courses and regulated by documents of the Ministry of Education. This means that in some vocational secondary schools, environmental issues are not taught, and students have to rely on knowledge acquired in elementary school. However, these schools have Geography as part of their curriculum (some have even a 4-year curriculum), so students will be educated on some environmental issues but to less extent than in gymnasiums. It is important to recognise that in some vocational schools, an Ecological Technician course is available. This course is much more interrelated with ecology and environment, i.e. in line with Environmental Citizenship, so students will be educated in other activities that focus on the care and protection of nature and the environment.

In the Croatian education system, a programme called 'Citizenship upbringing and education' is also available (MSES 2014) that is more in line with a Future 2 perspective, emphasising socialisation and subjectification as learning goals. This programme consists of several themes, which are aimed to be integrated through inter-subject themes, advisory sessions and extra-classroom activities. One of these themes is 'Ecological dimension related to other dimensions', and students learn about (a) the sustainable social, economic and cultural development of the local environment and environment of Croatia, Europe and the world; (b) the right to a healthy environment and sustainable development of the community; (c) the influence of economics, science, culture and politics on environment; and (d) the role of individuals and civil society in ensuring sustainable development.

13.2.3 The Case of the Netherlands

Before discussing the Dutch case on the inclusion of Environmental Citizenship and Education for Environmental Citizenship in secondary schools, the educational system needs to be elucidated. The Dutch secondary education system (ages 12–18) is divided into four main tracks: (a) preuniversity education (6 years); (b) general secondary education (5 years); (c) pre-vocational education (4 years); and (d) vocational training programme (4 years). Each level provides access to different higher education institutes: university (a), higher professional education (b), senior secondary vocational education (c and d), and each track has its specific national examination requirements: the formal curriculum (CvTE 2016a).

Overall, sustainability and citizenship education are quite well represented in preuniversity and general secondary education tracks of the Dutch secondary school curricula, but not specifically referred to as Environmental Citizenship or Education for Environmental Citizenship. The Biology and Chemistry curricula in these two tracks prescribe content-specific requirements related to sustainability such as human influence on energy preservation and sustainable production processes.

Moreover, the formal curricula include sustainability as a context in which students should be able to reason in, for instance, the interaction of ecosystems, biodiversity, food production and energy conversion, which is more in line with a Future 1 perspective on education. Remarkably, the examination requirements for physics do not include the word or theme of sustainability or Environmental Citizenship at all, although teachers indicate they often teach subjects in the context of sustainability, such as solar cells, wind turbines and nuclear energy. The formal curricula for the pre-vocational education and the vocational training programme tracks have only very limited references to Environmental Citizenship or Education for Environmental Citizenship, one sentence stating such a reference is: 'to pay attention to the relation between human and nature and the concept of sustainable development' (CvTE 2016b, p. 1). However, the attainment targets for lower secondary education the 'Kennisbases' ('Knowledge base') – which crosscut the different tracks – include sustainability thinking ('denkwijze duurzaamheid') as a specific way of thinking to the science curriculum.

The importance of citizenship education for sustainability is also reflected by the Dutch national science curriculum for both lower and upper secondary education. Next to content-specific examination requirements, a more overarching competence is included in all science subjects (Biology, Chemistry and Physics) since 2016, similar to the 'Working Scientifically' tenet of the English National Curriculum for Science. The curricular examination requirement A9 'waarderen en oordelen' ('to value and evaluate') asks for the evaluation of situations in nature and technological applications, using scientific arguments, normative considerations and personal opinions (CvTE 2016c, p. 3; 2016d, p. 3; 2016e, p. 3). Here, we can see a more Future 2-based curriculum aiming for socialisation and subjectification (Biesta 2015) more in line with the goals of Environmental Citizenship and Education for Environmental Citizenship. The flip side of these more overarching general competences is that these are either not assessed in the national examination or they are assessed to a lesser extent. As a result, the attention paid to these skills in classroom practice largely depends on policies of individual schools and teachers. This is underlined by a comprehensive study initiated by the government on the status quo of education for sustainable development in the Netherlands. This study reports that one of the areas where the Netherlands is performing well (in an international perspective) is taking an integrated approach to education for sustainable development (Het Groene Brein 2015). However, for formal secondary education, support for schools to move forward on this topic is limited, and structural implementation in teaching is far from optimal. Since 2014, the attention on education for sustainable development has increased. This was initiated especially by Dutch youth organisations involved in the process of ensuring proper integration of sustainability in school curricula. This attention on sustainability is reflected by the increasing awareness on citizenship education at the national level as well (Platform Onderwijs2032 2016) and has made the curriculum more future-proof. Since 2018, national teacher teams and school leaders have updated the curricula for the different domains in secondary education. The outcomes and suggestions will be presented to the government in 2019.

13.3 Teaching Approaches for Environmental Citizenship

Several educational approaches can serve as an answer to the requirements for a Future 2 education. In the context of non-formal education (Chap. 14), pedagogies have been described that can also be included in formal settings. These include *place-based education, civic ecology education, ecojustice pedagogy, action competence, socio-scientific inquiry-based learning* and pedagogies that could build student competencies for civic participation contributing to environmental and social change. Here, we elaborate one approach that is only briefly described in Chap. 14 – *Socio-Scientific Inquiry-Based Learning* (SSIBL) – since it has been extensively evaluated in formal secondary science education settings (in addition to primary education) as well as teacher professional development programmes in 11 countries (www.parrise.eu). SSIBL integrates educational approaches that are often presented independently in schools: inquiry-based science education and citizenship education. Integration of these approaches has been inspired by the European Union call for an ongoing involvement of the society in all phases of the research and innovation process (European Commission 2019). For Science, Technology, Engineering and Mathematics (STEM) education, this calls for the integration of both inquiry-based science education and citizenship education in the curriculum and classroom.

Inquiry-based science education is a problem-based approach with an emphasis given to experiment (Rocard et al. 2007). Methods for inquiry-based science education provide children with the opportunities to develop a large range of complementary skills such as working in groups, being able to express themselves textually and verbally, and experiencing open-ended problem-solving and other cross-disciplinary skills (Rocard et al. 2007). This call for inquiry-based science education is based on the recognition that science is essentially a question-driven, open-ended process and that students must have personal experience of scientific inquiry to understand this fundamental aspect of science. The understanding of inquiry is guided by five essential features of inquiry that have been recognised by the US National Research Council (2000), which state that the learner (a) engages in scientifically oriented questions; (b) gives priority to evidence in responding to questions; (c) formulates explanations from evidence; (d) connects explanations to scientific knowledge; and (e) communicates and justifies explanations. Learning and teaching about inquiry-based science education can be seen as a continuum beginning with close-ended and ending with open-ended inquiry.

SSIBL is a recently developed approach and combines inquiry-based science education with citizenship education, starting from socio-scientific issues. This approach has been evaluated extensively in science teacher professional development, as well as in classroom settings (Amos et al. in press; Knippels and van Harskamp 2018; Levinson 2018; Levinson et al. 2017). Socio-scientific issues – such as global warming – are problems that often arise in our society and have a scientific and/or a technological component. They are issues or problems because there is no consensus on how such problems might best be solved for the well-being

of individuals and the society more broadly, and therefore they have inherent moral and ethical components (Sadler 2011; Ratcliffe and Grace 2003). To be able to deal with these types of issues, students have to know how to recognise and interpret data, understand how different social factors can have different effects and understand that stakeholders often have diverging opinions (Sadler 2004). Examples of socio-scientific issues concerning environmental education are the deployment of alternative energy resources, the environmental effects caused by the production of socially useful materials or the climate effects as a result of increased carbon dioxide emissions.

Through socio-scientific issues, the approach of SSIBL introduces the socio-inquiry at school. According to Levinson (2018, p.31), this is core to this approach: 'Inquiry means to ask questions and seek insights into problems that intrigue us. These questions can be broad but also focused. They can arise from curiosity about natural phenomena, or be more socially-oriented. What's inside bubbles? Do birds sleep? Is chocolate bad for you? Is cycling to school really healthier than going by car? Are new technologies all they claim to be? SSIBL is therefore different from regular forms of scientific inquiry in schools because it is based on scientific methods and social considerations'. The core idea of citizenship education in SSIBL is to participate critically in taking action. With this approach, students can argue a point with personal commitment, using evidence and reason and listen carefully and considerately to what others have to say. The approach promotes respect for the views of others and to have an open mind; if a fellow student advances a better argument, one can judge it on its merits (Levinson et al. 2012).

Teaching SSIBL has three main stages: authentic questions (Ask), exploration (Find out) and action (Act). A classroom activity could start with raising meaningful and authentic questions (Ask) about socio-scientific issues (see Fig. 13.1, retrieved from Levinson et al. (2017); Amos et al. in press). To explore these questions, social and scientific inquiry is used (Find out). Finally, students are stimulated to form opinions and formulate solutions (Act). However, this model does not necessarily have to be followed sequentially. For example, 'Ask' might arise from an investigation to 'Find out'.

The three main stages of SSIBL (Ask, Find out, Act) can be introduced in classroom settings with the help of educational phases that have been implemented and evaluated in teacher professional development sessions and lesson designs, with the aim of critical and democratic citizenship in science education (Knippels and van Harskamp 2018):

1. Introduction of dilemma: connect to student's daily life, interest
2. Initial opinion-forming (individually or in small groups)
3. Raise questions: 'need to know' (e.g. content related, social and/or personal questions)
4. Inquiry: students answering the questions raised through social, personal and scientific inquiry
5. Dialogue: value communication and clarification
6. Decision-making: formulate solutions that help to enact change

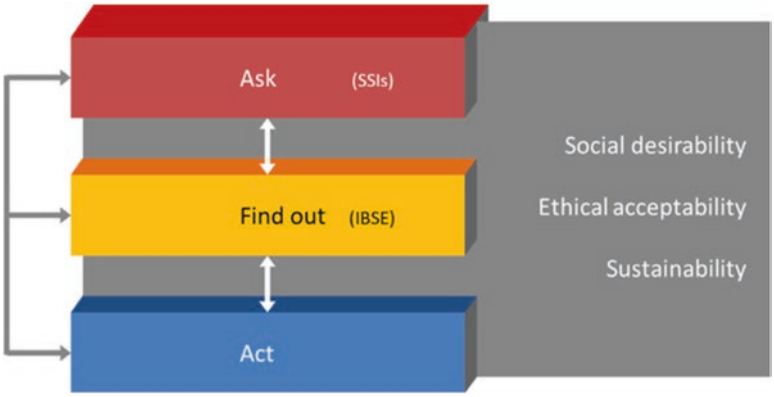

Fig. 13.1 Stages of the SSIBL model. (Retrieved from Levinson et al. 2017; Amos et al. in press)

7. Reflection: on student's opinion-forming process (metacognition)

Here, we will provide one example of a typical case for SSIBL outlined by Romero-Ariza and colleagues (2018). In this Spanish case, secondary school students studied whether pangasius fish should be sold in supermarkets and stores ('Ask'). Guided by supporting questions, teams of 3–4 students studied the various arguments for or against pangasius sales, ranging from environmental to health and socio-economic arguments. Environmental arguments concerned the conditions of pangasius fish farming in Vietnam, over-exploitation and the impact on the environment. Subsequently, these arguments were exchanged and discussed in a classroom debate. One of the main outcomes was that the actual toxicity of pangasius consumption, obtained from scientific sources, was not in accordance with media coverage where the fish was depicted as 'poisonous' ('Find out'). The school students undertook actions, which ranged from personal decisions on whether to keep on eating pangasius fish to recommendations to the school canteen or to other supermarket chains, based on the outcomes of their inquiry ('Act'). The authors concluded that 'Such actions enhance the sense of ownership and empowerment and give a sense of purpose to the learning taking place' (Romero Ariza et al. 2018, p. 43–44).

Based on this overview, we would argue that SSIBL is a pedagogy that can foster democratic citizenship in general, and Environmental Citizenship in particular. Therefore, we would suggest that this teaching approach would be well suited for the implementation of Education for Environmental Citizenship in formal secondary education. In order to accomplish this aim, it is important to engage teachers on different subjects in Education for Environmental Citizenship. One way of doing this is through teacher professional development programmes. The SSIBL approach to teaching has been introduced to several hundreds of teachers in 11 different countries in the PARRISE project via a systematic use of professional development training (www.parrise.eu). In the programmes the same approach can be used but adopted to local contexts and conditions of various countries and school forms. For

example, in a professional development programme at the Weitzman institute in Rehovet, Israel, the three-stage model of SSIBL was used to teach investigate inquiry and civilian responsibility relating to the case of placing defibrillators at public places in order to rescue fellow citizens with cardiac arrest. The teaching module was developed based on students' questions related to a known case were a football player collapsed during a game and suffered severe injuries.

Besides specially designed teacher development programmes, Education for Environmental Citizenship also needs to be enacted within the existing structures of secondary schooling. In the next section, we will investigate this issue further.

13.4 Moving Towards Education for Environmental Citizenship in Secondary Schooling

Many teachers around the world want to develop their teaching and work interdisciplinary, but they feel they do not have the time because they need to keep up with the curricula. A recent report on teachers' perspectives on the state of environmental education in England has identified the tension between teachers' perceptions of environmental education as a subject that can promote active Environmental Citizenship and current perceived focus of the curriculum as emphasising the learning of subject knowledge (Glackin et al. 2018). Earlier research has shown extensive differences in how teachers from different school subjects enact various aspects of Education for Environmental Citizenship, such as social or ethical topics (e.g. Levinson and Turner 2002). In some school subjects, environmental topics are marginal or absent (e.g. Mathematics, Psychology), but they have a much higher profile in others (e.g. Environmental Science, Geography) (Dawe et al. 2005). Levinson and Turner (2002) also found differences between science and humanities teachers' understanding of the aim of their teaching. Humanities teachers are more confident when covering ethical and social issues, while science teachers are more focused on presenting the 'facts' of their subject. The same can be seen relating to the use of teaching methods; Humanities teachers have been shown to use class discussions more frequently than science teachers (Oulton et al. 2004). Summers et al. (2005) also found that science teachers compared to geography teachers to lesser extent use teaching methods that are more suitable to sustainability education. Corney (2006) showed that upper secondary school trainee teachers in geography felt that they lack the necessary subject expertise to teach sustainable development. These results from various studies show that teachers of different subjects in secondary education understand and teach issues relating to the environment, sustainability and citizenship quite differently. The teachers of the various school subjects transform the curricular content in different ways, although addressing the same topic (Gericke et al. 2018).

Previous research in Sweden has shown that teachers of different school subjects and subject areas have different approaches to environmental and sustainability education. Teachers in Sweden typically teach environmental issues according to three different selective traditions (Sund and Wickman 2011). The three Swedish selective traditions are the fact-based tradition, the normative tradition and the plu-

ralistic tradition (Sandell et al. 2005). In the fact-based tradition, environmental issues are regarded as ecological issues. Environmental problems are based on a lack of knowledge and can be solved by learning more science. In the normative tradition, environmental and developmental issues are primarily a question of values, where people's lifestyles and their consequences are the main threats to the natural world. Increased uncertainty on complex issues, such as climate change, is an important point of departure for the pluralistic tradition. Here, environmental issues are viewed as both moral and political problems, while environmental problems are regarded as conflicts between human interests.

The distribution of these three teaching traditions varies in different school subjects. For example, science teachers teach in a more fact-based way than social science and language teachers (Borg et al. 2012). Hence, student groups may encounter different teaching content and approaches between different subjects. Many school subjects are limited by the curricular goals and the organisation of education that constrain cross- and/or inter-disciplinary efforts, as shown in the cases of the different countries in this chapter. Therefore, teachers are likely to build their conceptual understanding of Environmental Citizenship and Education for Environmental Citizenship on the foundation of their own subject traditions. Education for Environmental Citizenship is multidisciplinary by nature, and this fact might be an obstacle for subject teachers, an argument supported by Stables and Scott (2002). Earlier studies have shown that if teachers have a holistic understanding of concepts, such as Environmental Citizenship, they will use a broader approach to teaching and learning, while a narrowed understanding is often associated with narrow approaches to teaching (Petocz and Reid 2002).

As shown in this and other chapters of this volume, Education for Environmental Citizenship is rooted in a Future 2 trajectory as outlined by Young and Muller (2010), and this could hinder the inclusion of Environmental Citizenship in formal secondary education. The reason is that the secondary school system of many countries is more rooted in a Future 1 trajectory focusing on disciplinary content knowledge, as has been exemplified in this chapter. However, Young and Muller (2010) argue for a third curriculum principle, a Future 3 scenario, where the 'differentiatedness' of knowledge between different school subjects is recognised. This might be important for Education for Environmental Citizenship because different disciplines have different knowledge structures, for example, science and mathematics have conceptual-rich and hierarchical knowledge structures demanding a certain learning progression, while social science subjects tend to advance through variation or diversification of concepts (Young and Muller 2010). Therefore, to engage teachers of different subject specialisation, as commonly found in formal secondary education, the subject boundaries as in a Future 3 trajectory need to be kept. In that way the specialist knowledge of teachers of different disciplines can be used in Education for Environmental Citizenship. The difference from a Future 1 perspective is that the boundaries between the subjects, i.e. how the concepts are interpreted differently in different disciplines, how various disciplines generate new knowledge differently and how their ontological and epistemological starting points might differ, are all made explicit and problematised in a Future 3 perspective. Hence, in

implementing Education for Environmental Citizenship in formal secondary education, it is important that different disciplines contribute their different disciplinary perspectives in order to give a more holistic view of Environmental Citizenship instead of merely teaching the same thing in different classrooms.

As shown in this chapter, teaching Environmental Citizenship in formal secondary education is a task for teachers of different disciplines, and they need to be able to work together for that effort. One way of coping with the multidisciplinary issues of Education for Environmental Citizenship is to organise teaching through teams of teachers representing different school subjects. However, as shown from large-scale studies, cross-disciplinary work including teachers from different subjects is not commonly used by secondary schoolteachers when teaching on sustainability issues (Borg et al. 2012). There might be institutional obstacles to overcome, such as scheduling, exam and tests in the subjects, teaching traditions, etc. Fullan (2001) found that teachers are heavily affected by the school organisation and the norms, values and structures of the school in which they are working. These factors will have a huge effect on how individual teachers teach. If they were to work together in teams to implement Education for Environmental Citizenship, it is important that working this way becomes part of the regular school culture.

An important issue to address is what should this teamwork look like? Should it be based on interdisciplinary or multidisciplinary teaching? Multidisciplinary teaching is a cooperation without common aims, while interdisciplinary collaborations have a more coherent common mission (Blaye et al. 1991). Collaboration across subjects and subject areas in a school context is often referred to as cross-curricular teaching (Hudson 1995). Another important issue to address is then the differences in the subject areas contributing to Education in Environmental Citizenship in terms of the content, methods and purposes that students encounter in teaching. In what way is it possible to organise education in order to facilitate teaching approaches such as SSIBL described in this chapter, or other approaches like place-based education, civic ecology education, ecojustice pedagogy, etc., as outlined in Chap. 14. There are two different ways of understanding cross-curricular work in practice between different teacher groups: co-operation and collaboration as illustrated in Fig. 13.2 (Sund and Gericke n.d.).

In Fig. 13.2, a representation is shown of how three different school subjects cooperate on a common theme such as Environmental Citizenship but offer their own specific knowledge, teaching methods and perspectives to students. Hence, the teachers bring in their respective disciplinary perspectives and skills that provide a broad and holistic perspective on Environmental Citizenship, but they do not overlap making it difficult for students to relate the perspectives to each other. In collaboration, some parts are common for all three subject areas relating to Environmental Citizenship, whereas other parts are specific subject contributions to Environmental Citizenship (Fig. 13.2).

We argue that the collaboration model can be considered as ideal for cross-curricular teaching within a Future 3 trajectory, because the different subject perspectives complement each other holistically, while at the same time address commonalities relating the perspectives to each other providing possibilities for

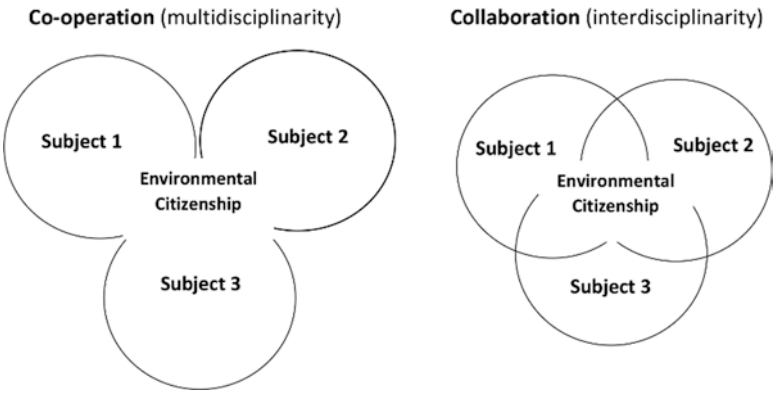

Fig. 13.2 Two ways of cross-disciplinary teaching in formal secondary education: cooperation and collaboration. (Modified from Sund and Gericke n.d.)

students' learning. This way of organising cross-curricular teaching of Education for Environmental Citizenship as a true collaboration between subject specialist teachers in formal secondary education could be a benchmark for the implementation of Environmental Citizenship in the future. It could also be a fruitful tool for identifying and developing ways by which interdisciplinary pedagogical instruction can realise the aims of Education for Environmental Citizenship. At the same time, challenges identified from a structural and policy perspective need to be addressed in order to create school cultures that can facilitate such collaborative initiates for Environmental Citizenship.

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Chapter 14
Educating for Environmental Citizenship in Non-formal Frameworks for Secondary Level Youth

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14.1 Characteristics of Non-formal Education Promoting the Attributes of an Environmental Citizen

For the purpose of this chapter, it is valuable to briefly distinguish between non-formal and informal education – terms that are often used interchangeably. Non-formal and informal learning takes place in out-of-school environments and settings (e.g. libraries, exhibits, museums, science centres, zoos, aquaria, botanical gardens and wildlife-based environments, community centres and organisations, etc.).

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Scholars (Eshach 2007; Falk 2006) assert that the distinction should take into account not only the physical environment in which learning takes place but other aspects, especially the underlying motivation and interest of the learner to learn, the social contexts and socially-constructed nature of learning as well as the organisation of the learning and assessment. According to Eshach, informal learning refers to learning that may happen in spontaneous situations that happen in people's lives and other unstructured activities. Thus, the learning is open, intrinsically motivated (i.e. individual's choice) and is usually individually lead (control over learning). Informal learning is often referred to as 'free-choice' learning (NAAEE 2009; Ballantyne and Packer 2005).

Conversely, non-formal learning occurs in a planned but highly adaptable manner in institutions, organisations and situations beyond the spheres of formal or informal education (Eshach 2007; Silberman-Keller 2003). While it is mediated, the motivation for learning may arise from the learner. An additional distinction relevant to the nature of learning is based on the frequency at which the places where learning occurs are visited. Accordingly, informal learning will happen in places where people's daily lives take place, e.g. homes, neighbourhoods and local playgrounds or school grounds during breaks. Spontaneous informal learning may, in principle, be experienced in places associated with free choice learning, such as zoos, museums and other such settings. As such visits can be infrequent, they are often organised and may include structured activities (especially when visited as part of a school programme), thus the type of learning that often occurs is non-formal (Esach 2007). Table 14.1 compares formal, informal and non-formal learning.

While the formal educational system is traditionally viewed as a main framework for conducting Education for Environmental Citizenship, both non-formal and informal are recognised as important arenas for educating the public about the environment (Hollweg et al. 2011; NAAEE 2009; Ballantyne and Packer 2005; UNESCO 1978) and as arenas for lifelong learning, which is acknowledged as a crucial component towards building sustainable societies and futures. Since the average citizen spends only about 3% of their lifetime in school, the ability to

Table 14.1 Differences among formal, informal and non-formal learning (taken from Eshach 2007)

Formal	Non-formal	Informal
Usually at school	At institution out of school	Everywhere
May be repressive	Usually supportive	Supportive
Structured	Structured	Unstructured
Usually prearranged	Usually prearranged	Spontaneous
Motivation is typically more extrinsic	Motivation may be extrinsic but typically more intrinsic	Motivation is mainly intrinsic
Compulsory	Usually voluntary	Voluntary
Teacher-led	May be guide- or teacher-led	Usually learner-led
Learning is evaluated	Learning is usually not evaluated	Learning is not evaluated
Sequential	Typically non-sequential	Non-sequential

access, critically evaluate and utilise information must continue throughout people's lives. Non-formal and informal settings offer the opportunity for such lifelong learning. Additionally, these frameworks can support students' learning in formal education and this is increasingly acknowledged and utilised (for example, Bell et al. 2009). Since most learning is attained outside of schools, which is especially true for environmental learning, there is increasing recognition of the significant role of various free-choice learning venues (Table 14.2) in peoples' lifelong environmental learning (Falk, 2006).

In recent years, the learning ecosystem has become prominent in which formal, non-formal and informal learning experiences are studied in an integrative way. According to Bevan (2016, p. 18), "Ecological theories of learning are based on the idea that learning develops over time and in multiple settings. Learning opportunities are made possible and shaped by the learning ecology that one inhabits. A *learning ecology* is the physical, social, and cultural context in which learning takes place". Educators who design interventions for learning ecologies will develop a learning module for formal education, which then extends to the home situation (informal) or is combined with a visit to a science centre (non-formal). Environmental education in general, and Environmental Citizenship in particular, could benefit from an integrative learning ecology approach. The question in learning ecosystems is how to create rich ecologies of learning that support momentum for individuals throughout their lives and provide resources so that they can navigate specific pathways. These momentums are often curiosity-driven and individuals may choose to look for resources inside and outside formal education.

Table 14.2 Free-choice venues for learning about the environment. (Adapted from Falk 2006)

Generic group	Exemplar Venues
Museums	Natural history museums, science centres/museums, zoos, aquariums, botanical gardens, arboretums, nature centres
Environmental education centres	Structured programmes sometimes linked to formal curriculum
Parks	Local, regional, national
Ecotourism sites	Whale-watching and marine watching tours, safaris and wildlife encounter trips, lodges in natural areas, Earthwatch expeditions (citizen science)
Audio-visual media	TV programmes, films and videos, radio
Printed media	Newspapers, magazines and periodicals
Electronic media	Internet, social networks (Facebook and Twitter), petition web sites (Change.org)
National Community-based organisations	World Wildlife Fund, Sierra Club (USA), Society for Protection of Nature (SPNI).
Clubs and movements	YMCA and YWCA, boys and girls clubs, scouts, youth movements, Elderhostel (USA organisation of educational travel tours for older adults).
International days celebration	Sea clean-up day
Home environment	Conversations (family and friends), neighbourhood and playgrounds.

While non-formal education shares the attribute of being mediated with formal education, a major assumption of non-formal education is that social and educational goals can, and should, be realised via content and principles that deviate from rigid formal education structure. The following presents several characteristics of non-formal education and their relevance to developing Environmental Citizenship.

- *Conversation* – Conversation in peer communities under guidance (youth worker or guide) is a generative element of non-formal education that facilitates learning (Goldman et al. 2017; Kiilakoski and Kivijärvi 2015). In the context of environmental education, Orr (1992) acknowledges 'good conversation' as one of the components of education that can develop ecological literacy. It acknowledges diversity (existence and interest of others), is not neutral – through it people define themselves in relation to another (people and their environment), and it has structure and purpose (Orr 1992). Through these, conversation expands people's experiences, promotes learning and supports democracy via the practice of criticising political life. Less opportunity for such 'good' conversation exists under the common circumstances of governed formal education curricula.
- *Networks* – These define the structure of non-formal education organisations and reflect their communicative pattern in contrast to the hierarchical unified structure of the formal education system, and facilitate a multidirectional and more symmetric form of communication (Silberman-Keller 2003). In Capra's (1996) concept of eco-literacy (learning from ecological communities), a network implies interdependence, thus the success of the community as a whole depends on the success of its individuals and vice versa. Comprehending interdependence means understanding relationships – a shift in perception from focus on objects to focus on relationships and patterns in these relationships. This type of perception is characteristic of systems thinking, which is uncontested as a key toward sustainability and educating for sustainability (Senge 2012; Capra 1996). Thus, from both the communication perspective and developing ecological literacy, the goal of promoting sustainability networking contains a crucial component for achieving social change.
- *Tight* versus *loose learning spaces* – Kiilakoski and Kivijärvi (2015), in the context of Finish Youth Clubs as spaces for non-formal learning, distinguish between tight and loose learning spaces. Tight spaces presume functionality (e.g. a preplanned rigid schedule) and homogeneity. Schools are the classical example of tight spaces. Conversely, non-formal learning environments are loose learning spaces – they enable heterogeneity, change, adaptable learning opportunities, and an emphasis on negotiation as opposed to rigid curricula or rules.
- *Educational institution* – While school is the only arena of formal education, the venues for non-formal education are diverse, and include clubhouses, communes, community centres, youth-group branches, etc. Silberman-Keller (2003) asserts that the participants in non-formal educational activities view their non-formal learning environment as an accommodating and secure "alternative home" and as such do not experience alienation, lack of identity and lack of instrumental functionality that characterize the structured school or workplace, where young people and adults spend their compulsory time.

- *Mutual development* – From the perspective of socialisation, non-formal pedagogy aspires for mutual development – the group will develop as long as its participants develop and the individual will develop as long as the group develops. This provides a positive metaphor for the reciprocal relationship between the individual and society and can thus enhance the social responsibility required of environmentally responsible citizens (Goldman et al. 2017).
- *Experiential learning* – Learning that involves social involvement contributes to developing a sense of responsibility, evoking feelings and changing attitudes, environmental awareness, and a sense-of-place (e.g. physical, cultural and community identity), that together promote environmentally sustainable behaviour.

This brief consideration of various characteristics of informal and non-formal education and their relevance to environmental learning/educating for sustainability underlines the potential contribution of these frameworks in developing many of the cognitive and, importantly, affective components of Environmental Citizenship. From the affective dimension, these settings inspire curiosity and exploration, evoke feelings and may change attitudes, nurture a sense of personal and community identity, and can influence people's decision-making concerning ethical and moral issues relating to daily lives (Ballantyne and Packer 2005). Falk (2006) claims that "…such experiences invariably result in a more knowledgeable individual possessing an incrementally enhanced motivation and capacity to learn more in the future…" (p. 266). The non-rigid but guided process that takes place in non-formal educational situations can facilitate the development of rational and authentic decision-making. Additionally, non-formal settings offer a more open (loose) framework that enables people to interpret experiences according to a personal perspective and personal interests, as well as to construct a personal worldview. Falk (2006) identifies an additional benefit of free-choice learning that is associated with out-of-school and, specifically, non-formal learning settings. This type of learning is bottom-up and individually-driven (as opposed to top-down institutionally-driven), and it provides the opportunity for lifelong learning, which, in a world that is becoming progressively knowledge-driven, is acknowledged as crucial. The importance of non-formal and informal education frameworks as arenas for engaging citizens in sustainability (Goldman et al. 2017) stems from these attributes.

14.2 Pedagogies, Teaching Tools and Learning Schemes of Secondary Non-formal Education for Promoting Environmental Citizenship

Activities in non-formal settings can provide innovative alternatives to class-based teaching systems. They can stimulate personal interaction in problem solving, develop the willingness and the competences for critical and active engagement in individual and collective spheres within democratic contexts, and take into account inter-generational equality and justice. Therefore non-formal settings for secondary education level could contribute to Education for Environmental Citizenship by pro-

viding the opportunity and conditions that enable young people to acquire the body of knowledge as well as the necessary skills, values, attitudes and pro-environmental actions that an Environmental Citizen should be equipped with. In doing so, young people will be empowered and motivated to act and participate in society as an agent-of-change in the direction of solving contemporary environmental problems, preventing the creation of new environmental problems, achieving sustainability, and restoring our (human) relationships with nature.

Non-formal activities of EE have focused primarily on individual changes, especially on attitude and behavioural changes related to environmental aspects (Kool 2012). By building knowledge and environmental behaviours, teachers who have committed themselves to environmental learning have looked to environmental literacy and positive nature-based experiences for the development of ecologically responsible citizens (Hungerford 2010; Marcinkowski 2010). However, more recently, environmental educators and researchers support the need to move beyond a central focus on individual changes in attitude and behaviour, to collectively build a better understanding of environmental learning processes aimed at socio-ecological change (Orr 2004). Thus, EE practices that only attempt to change individual behaviour or increase students' knowledge of environmental issues will fall short of promoting Environmental Citizenship. EE is not detached from environmental policy (De Carvalho and Lemos de Souza 2018). Thus, the role of EE is to provide students with the opportunity to learn how to be active Environmental Citizens within their communities through civic participation and active engagement, while helping students to understand the structural and systemic roots of social and environmental problems.

How can we collectively develop in today's youth the knowledge, skills and competencies required to be ecologically and socially responsible Environmental Citizens? What kinds of pedagogies and learning experiences could potentially develop students' skills for deep civic participation, contributing to environmental and social change?

The following pedagogies, teaching tools and learning schemes of non-formal education could be complementary to formal secondary education in promoting Education for Environmental Citizenship.

14.2.1 Place-Based Education

The Place-based framework and its variations (e.g. expeditionary learning, pedagogy of place, problem-based learning, service-learning) seeks to make "the boundaries between schools and their environments more permeable by directing at least part of a students' school experiences to local phenomenon ranging from culture and politics to environmental concerns and the economy" (Smith 2007, p. 190). Such an approach does not diminish the importance of conceptual understanding and skills as a result of the educational process; on the contrary, these elements are integrated into an experiential and multidisciplinary learning environment in non-

formal sites that also have the potential to contribute positively to the community (Paraskeva-Hadjichambi et al. 2012; Gruenewald 2003.) Some scholars prompt teachers to introduce critical pedagogy into a place-based educational approach. They argue that students should not only be involved in and interact with the local context, but also be encouraged to critically examine local issues of power, ethnicity and alternative ways of teaching (Tuck et al. 2014; Cole 2007, Gruenewald 2003). Gruenewald (2003) argues that through place-based learning, students should be guided through a 'reinhabitation' process where they criticise the historical and contemporary contexts of their places, while also working to restore social and environmental practices (Smith 2007, p. 192).

EE practices that aim to connect students to their local environment and community and provide the opportunity to participate in the social dimension of a place, have the potential to promote the form of Environmental Citizenship supported in this chapter. The power of place-based learning lies in its ability to offer students genuine opportunities to participate in making positive changes in their local communities, leaving students with a higher "sense of their own agency and collective capacity" (Smith 2007, p. 192). "Place-based educational experiences in non-formal settings are connecting secondary school students with their communities and regions in ways that would probably not otherwise occur. Such learning lays the groundwork for civic participation" (Smith 2007, p. 203).

Place-based education can also help connect with the places where people live and the natural environment, creating a healthy relationship with nature (ENEC 2018). Scholars begin to recognise the important role played by the 'sense of place' in contributing to environmental concern and the motivation of people to act in environmental ways (e.g., Scannell and Gifford 2010; Stedman 2002; Vorkinn and Riese 2001). While place-based pedagogy does not explicitly define the concept of place, researchers have given recent attention to this relationship (Kudryavtsev et al. 2012; Semken and Freeman 2008, Vaske and Kobrin 2001). Of course, this is an area that is worth more empirical work, but it highlights the effectiveness of place-based education by linking people with their local community so that they consider themselves as citizens of their community. It encourages people to "to think and act as members of the public – not as consumers or producers or private persons, but as citizens who have a stake in maintaining a vital public realm" Dagger (2003, p. 41). This is very important for the empowerment of Environmental Citizens as described by ENEC (2018).

14.2.2 Civic Ecology Education

Civic ecology pedagogy (Tidball and Krasny 2010) can provide another example of how Environmental Citizenship could be promoted in non-formal settings. Civic ecology is defined as "stewardship practices that integrate social and environmental values within a social – ecological systems framework … where participants act as stewards of their environment through practices such as community gardening,

community forestry, and watershed restoration" (Tidball and Krasny 2010, p. 466). These practices create place-based learning in real-life resource management environments, allowing for an experiential and participatory learning process, while enhancing ecosystem and social health, which they call the 'ecology of environmental education' (Tidball and Krasny 2010). Civic ecology includes "urban environmental education programs that engage youth in community-based stewardship to restore" urban habitats, which incorporate both 'nature contact' and "democratic deliberation" (Tidball and Krasny 2010, p. 5). In this way, civic ecology education is inherently politically oriented, linking participants with developing movements such as civic environmentalism (Light 2003; Shutkin 2001) and the renewal of citizens (Sirianni and Friedland 2001).

Civic ecology education is an approach that combines traditional EE with civic engagement or service learning. Such a model provides a more exciting framework for promoting Environmental Citizenship, which goes beyond individual knowledge, attitudes and behaviours, in order to empower individuals to engage in the democratic processes required to meet the urgent need for sustainability. In addition, in civic ecology education, citizenship is treated as a collective enterprise, both in terms of strengthening the civic commons (Light 2003), and by challenging the existing institutional structures for the resumption of a democracy that favours sustainability (Maniates 2001). In this way, Education for Environmental Citizenship is more than just the promotion of individual virtues or changes in behaviour towards better environmental goals. It is a collective action based on practices where local communities can 'do something together' (Light 2002, p. 167).

14.2.3 Ecojustice Pedagogy

Ecojustice pedagogy could promote Environmental Citizenship of secondary school students in non-formal settings, since it calls for time spent in "out-of- classroom spaces and places; experiencing the knowledges of different cultures and cultural relationships to place; gaining a diversity of natural history knowledge; and developing community relationships and actions" (McKenzie 2008, p. 366).

Ecojustice pedagogy, which bridges western scientific knowledge with traditional ecological knowledge, combined with a multidisciplinary approach to learning, helps us move beyond the binary and disconnect. As a result, science and environmental learning – which is often abstract and extremely complex when taught in a classroom and from a textbook – becomes much more accessible, visible and relevant to students. Students can take this 'personal knowledge' and transfer and apply it to their daily lives in their homes, despite of geographic, socio-cultural and socio-economic diversity.

Ecojustice pedagogy incorporates a relationship-oriented, ecological conceptual framework that supports a wider global worldview. It adds an ecological lens to social justice. In other words, it extends the values of justice to include the environment and 'environmental racism' (Paraskeva-Hadjihcambi et al. 2015; Bowers

2002). Ecopedagogy, which is within the broader theory of ecology, offers a valuable pedagogical lens that help to establish epistemological elements of ecological thinking in meaningful practice.

Through ecojustice education, students become familiar with ecologically sustainable practices of different cultures and prioritise pupils' participation in 'non-commodified aspects of community life' (Bowers 2002, p. 21). Additional strategies for implementing ecojustice pedagogy include: learning principles of ecological design; regenerating non-commoditized skills, knowledge, and relationships of self-reliance; and democratizing technology and science (Bowers 2002, pp. 30–32).

14.2.4 Action Competence

EE in authentic inquiry and action along with civic engagement is more appropriate in non-formal conditions for facilitating the kind of Environmental Citizenship required for sustainability (Berkowitz et al. 2005). In order to achieve a deep transformation of the community, an emerging trend is the development of 'environmental action' or 'action competence' in young people as a critical objective of environmental learning (Schusler and Krasny 2010; Jensen and Schnack 1997). Given that research on the EE explores the learning process for youth empowerment to participate in environmental action in the public sector (Almers 2013; Arnold et al. 2009), discussions are also taking place on the growing relationship between environment, science and civics education. These interesting discussions direct the emerging trend of environmental and scientific learning with the aim of active democratic citizenship (Wals and Jickling 2009; Gough and Scott 2007).

As an educational approach, environmental action does not aim to modify specific behaviours such as energy saving or recycling, but rather to bind youth to develop action strategies for environmental issues they consider relevant. It involves joint decision-making, which happens when adults and young people work together to design, implement and evaluate a project, whether the project is started by young people or adults (Schusler and Krasny 2010; Jensen and Schnack 1997).

Several examples of young people taking environmental action have been documented in educational practice:

- Natural environmental renovations (e.g.: tree planting to stabilise streambanks, transformation of empty lots into community gardens).
- Community education (e.g.: organising community information fairs, producing educational tools such as newsletters or videos).
- Inquiry (e.g.: community evaluations, surveys and mapping, scientific experiments designed to update or evaluate the action).
- Public problem analysis and support for policy change (e.g.: research and analysis of the environmental impacts of on-site waste water treatment regulations and presentation of policy recommendations to a state legislative committee).
- Products or services that contribute to community progress (e.g.: sustainable food for sale in a neighbouring rural market).

14.2.5 Socio-Scientific Inquiry-Based Learning

The Socio-Scientific Inquiry-Based Learning (SSIBL) approach is another pedagogy that can foster democratic citizenship in general and Environmental Citizenship in specific, in-formal and non-formal settings (Amos et al. in press; Knippels and van Harskamp 2018; Levinson 2018; Levinson et al. 2017). The core of the approach is 'inquiry' into personal, social, global and scientific aspects of a controversial issue, such as environmental issues. The SSIBL approach draws together three interacting pillars – Inquiry Based Science Education, Socio-Scientific Issues and Citizenship Education – within the umbrella of Responsible Research and Innovation. The latter aims at bringing together various stakeholders (e.g.: consumers, interest groups, scientists, policy-makers, businesses) to produce realistic, balanced, just, and ethically-based outcomes to the innovation process covering the entire Research and Design process from its inception to distribution of social goods. SSIBL operationalised this aim broadly within school education, and more specifically within science education.

The SSIBL approach is based on learning through asking authentic questions about controversial issues arising from the impacts of science and technology in society. These questions are open-ended, they involve participation by concerned parties, and are aimed at solutions that help to enact change. The SSIBL approach consists of three key elements:

- Raising authentic questions about controversial issues arising from the impact of science and technology in society [Ask].
- Integrating social and scientific inquiry to explore these open-ended questions [Find out].
- Formulating solutions which help to enact change [Act].

This approach aims to: (1) encourage young people to participate in research and innovation issues that are influenced by science and technology; (2) promote interest in STEM; and (3) support young people in acting as knowledgeable social agents through inquiry.

14.3 Examples of Secondary Non-formal Settings and Programmes Suitable for Promoting Education for Environmental Citizenship

The following examples illustrate some non-formal settings and programmes that could promote Education for Environmental Citizenship. These case studies implement the pedagogies previously described (see sect. 14.2). It is important to clarify that most of them are based on the philosophy of Education for Sustainability, however, many have characteristics of Education for Environmental Citizenship.

14.3.1 Environmental Education Centres as Non-formal Settings Promoting Education for Environmental Citizenship: "Environmental Crime on the Coast", Cyprus

The term 'environmental centre' is internationally used and covers centres outside of school frames with a variety of goals, activities and organisational structures. They are therefore termed as Outdoor Education Centres, (e.g. England), Field Studies Centres, (Mexico), Campus (USA, Hong Kong.), and National Park Centres, (Kruger National Park, South Africa).

Environmental education centres provide a basic link between non-formal and formal EE through structured programmes for students. The short time spent on visits often does not allow a full response to the goals of Education for Environmental Citizenship, but at least provides the opportunity for students to experience other forms of learning exclusively dedicated to the environment away from school, where the possibility to combine theory with a closer contact with the environment is offered.

The Cyprus Centre for Environmental Research and Education (CYCERE) is one of the most active environmental organisations in Cyprus, implementing innovative non-formal environmental education programmes related to the field of Education for Environmental Citizenship. "Environmental Crime on the Coast" is an example of such an educational programme. This programme is directed to secondary school students, age 13–18, and promotes the conceptual understanding of environmental issues, the cultivation of scientific and problem solving skills, as well as the development of environmental attitudes, values and awareness of students on the coastal ecosystem through a holistic and experiential learning approach. The methodological approaches adopted follow the principles and the philosophy of Environmental Education (EE) and Education for Sustainability (EfS), fostering team spirit and cooperation (Hadjichambis et al. 2015).

This daylong programme motivates students to participate in a sequence of activities, which emphasise both theoretical and practical aspects. It is organised in a way that supports the understanding of environmental concepts and issues and engages students into an exciting learning adventure.

1. *Students' Mission*

   Students arrive at the coast and are informed that as members of the "Environmental Crime Investigation Department" they are invited to investigate a crime related to the coastal area. Solving the mystery requires students to go through different data collection stations and evaluate evidence by participating in various experiential activities.
2. *Inquiry*

   (a) *The ecosystem*: Students gather information from scientific articles, data regarding abiotic and biotic factors and they become familiar with the eco-

system of sand dunes. They also study the process of sand dune creation and development through experimental and playful ways.

(b) *Food web*: Using the evidence they collect about the food relations of the coastal living organisms, students discover the food web of the coastal ecosystem. They deepen their understanding on concepts of food relations while identifying plants and animals of the coast and their interactions.

(c) *The effect of garbage*: Students discover evidence relating to the decomposition rate of several materials and their impact on the coastal ecosystem. Through the data collected students awaken environmentally and realise the impact that anthropogenic waste can have on the coast and the natural ecosystems in general.

(d) *Coast and Humans*: Students identify several issues that are directly related to human presence on the Coast and the consequences of anthropogenic activities on the ecosystem. They explore and outline the relationships between humans and the coast and become aware of the importance of sustainable coastal management and protection developing positive environmental attitudes and values.

3. *Actions in Community*

Students returning to their school are encouraged to continue their action on an individual and collective level (class, school, community) to protect the coast. As a school, they adopt the specific coast and work to inform the public (peers, parents, relatives and stakeholders) on the need for coast protection. Additionally, they organise campaigns in the community to educate on actions that should be followed when visiting the coastal ecosystems, e.g. avoid trampling and vehicle driving on sand dunes, collect garbage, and avoid distracting the living organisms of the coast.

The several one-day experience programmes offered by CYCERE are used as a springboard to transfer the environmental issue back to each student's classroom, home and community. The students' active engagement in the community is an integral part of each programme; it focuses not only on personal environmental behaviour but also on civic participation. These programme characteristics contribute to a broader perspective of EE and expand the followed dimension covering aspects of Education for Environmental Citizenship.

14.3.2 Youth Clubs as a Youth Engagement Framework: Case Study of Israeli Youth Movements

The term used for a place where young people can meet and partake in diverse activities is usually one of the following: youth club, centre, group, or movement. Globally, they vary in their activities as well as histories according to cultural, political and social contexts, or voluntary or government support. Youth clubs comprise

a non-formal learning framework for young people. In many countries these clubs are officially recognised and supported as a framework for youth work that facilitates their capacity building and learning (Goldman et al. 2017; Kiilkowski and Kivijärvi 2015; Forkby and Kiilakowski 2014).

In Israel, youth movements (YMs) are defined as "non-formal organizations of young people active for young people, that have a consolidated vision and membership is voluntary" (Ministry of Education website) and they comprise one of the main agents involved in non-formal education of youth. Principles and requirements common to all formally recognised YMs include:

- education according to universal humanistic values,
- respect for human rights and cultural diversity,
- community and social involvement – contribution to the community and environment,
- cultivating critical thinking, readiness and willingness for change,
- personal and social self-realisation.

Throughout the years, Israeli YMs have contributed to society in general and to youth in particular in a diverse range of areas: promoting social values and human rights, encouraging coexistence, tolerance and social solidarity; reducing social gaps; cultivating leadership, democracy, responsibility and involvement; and reinforcing a sense of attachment to the country (place-attachment).

In view of the environmental-social challenges facing society, Riemer et al. (2014) emphasise the need for effective environmental programmes that engage youth in environmental actions outside the classroom, and are based on a socially transformative approach that promotes, among others, participatory democratic education, real-world contexts, action taking. Consistent with this, Israeli YMs are inherently 'youth engagement programmes' that promote the civic engagement of their members. Thus, they provide a pre-existing youth engagement framework in which the focus of civic engagement can be expanded to address environmental challenges (Goldman et al. 2017). Moreover, Riemer et al. (2014) acknowledge youth as a particularly good target group for civic environmental engagement, in part due to their ability to effectively reach other young people as well as other members of their community. In Israeli YMs, youth educate youth and work within the community; in this aspect they also provide a built-in framework for promoting youth environmental engagement.

Currently, there are 15 officially recognised YMs in which >250,000 young people are active (Ministry of Environmental Protection website). Following recommendations deriving from a national survey of environmental education in Israeli YMs (Yavetz et al. 2011; Goldman et al. 2017), various steps have been taken to increase the inclusion of 'environment' within their civic engagement (i.e. strengthen the involvement of YMs in sustainability and contribute to developing young people's Environmental Citizenship). Two noteworthy initiatives with potential for a ripple-effect within the YMs are:

1. Certifying 'Green' YM branches: Tying this non-formal framework into the national framework of certifying green educational institution ('green schools'). Criteria for certification include: establishing a green-committee (i.e. local 'green' leadership), incorporating means for waste reduction and resource efficiency (i.e. environmental management to reduce the branch's ecological footprint), incorporating environmental values and content into the content of activities, and conducting community projects within the surrounding community that promote active Environmental Citizenship of community members.
2. Providing environmental training to the YM leadership (chief directors of education in each of the YMs, coordinators of the YM branches, and older members who are conducting their year of social-service).

14.3.3 Learning from Forests: Certification Course Programme for Forest Pedagogy, Austria

Nearly half of the area of Austria (48%, 4 million ha.) is covered by forest; it is a country where forest management and the training of forestry staff has long been a tradition. Since the 1990s, Austrian forestry training institutions have offered a certification course called 'Certified Forest Pedagogue' that trains forest educators to make forests, as habitats and economic spaces, more accessible to the public. Forest pedagogy focuses on the dialogue between humans and nature and represents forestry-related environmental education on the diversity and functions of forests. These are current issues, especially as in recent decades conflicts have arisen due to the continuous demand for timber and the growing number of people using forests for recreation purposes.

All aspects relevant to forest pedagogy are discussed during the certification course. The training modules feature a combination of practical strategies (knowledge transfer), a wide range of methods and the development of competence for communication with different target groups depending on their specific needs. Participants' qualifications are developed and tested by the Federal Ministry for Sustainability and Tourism to guarantee a high standard of quality in the transfer of the pertinent knowledge. The validity of the certificate is linked to regular compulsory training events that ensure the specialist's knowledge remains up-to-date. A recertification is required every 5 years.

Up to 80 forest educators are trained in Austria each year, and they provide an important contribution to secondary non-formal education and Environmental Citizenship. In total, more than 1200 certified forest educators are active in Austria and their field of activities is wide. A particular strength of the programme is its interdisciplinary approach, providing both educators and professionals from the forestry sector with the possibility of supporting non-formal environmental education in creative and independent ways after certification. The importance of forest pedagogy is growing, especially with a view to the societal changes accompanying the ongoing trend towards urbanisation.

14.3.4 A Museum Lesson on Biodiversity Loss 'Endangered Animals and Plants, Disappearing Ecosystems', The Netherlands

At the Museon, a science museum in The Hague, The Netherlands, one of the major exhibitions is called 'One Planet'. In this exhibition, visitors learn more about the global societal challenges of our time, such as combatting poverty and hunger and fostering a sustainable world. These challenges are based on the 17 UN Sustainable Development Goals. Education material that accompanies the visit of secondary school students is aimed at teaching them the importance of preserving the earth's biodiversity. They learn how biodiversity originated and how it contributes to food production and health. More specifically, after the visit, students can provide argumentation why biodiversity is important.

One of three perspectives taken in the activities is that of 'politics of nature'. Politics of nature is about a fair distribution of natural resources, understanding what the international political arena looks like and how people deal with the resources. "Key ideas to be included are: sustainable development, north-south relations, respect for pluralism, exploitation, responsibility and democratic decision-making" (Van Weelie and Wals 2002, p. 1149).

In the lesson, biodiversity loss is regarded as a complex or 'wicked' problem. Therefore, biodiversity is approached in a systemic way: describing its complexity, as well as its preservation. Moreover, there are multiple ways of studying the impact of biodiversity loss. In one of the games, groups of students pretend they are fishermen, catching fish from a sea in which the number of fish is limited. The person who catches most fish wins. However, when all fish are caught all students have lost (Aartsen, personal communication, 2018).

14.3.5 The Program for the Recovery and Educational Use of Abandoned Villages. CENEAM. Centro Nacional de Educación Ambiental, Spain

The Program for the Recovery and Educational Use of Abandoned villages is an educational project complementary to teaching in the classrooms that has been developed in three towns: Umbralejo (Guadalajara), Granadilla (Cáceres) and Búbal (Huesca). The programme is promoted by the Spanish Ministry of Agriculture and Fisheries, Food and Environment, the Ministry of Development, and the Ministry of Education, Culture and Sport.

As most young people live in the urban world, the programme aims to have them reconcile with rural life and have the chance to understand the need for a change of attitudes to ensure the future balance of man with his environment. It includes work in different areas: environmental, health, animation and coexistence, and cultural

and physical recovery, with a special emphasis on environmental education and the recognition of the important role that the environment plays in the lives of people and the development of society, as well as the need to make decisions and act to avoid deterioration.

The objectives of this programme are, among others, the following:

- Promoting attitudes of respect and tolerance through participation in group activities.
- Helping students appreciate the richness and variety of the natural, social and cultural heritage, respecting their plurality.
- Deepening the knowledge of the human body in order to develop healthy lifestyle habits, both individually and collectively.
- Realising the different possibilities of using free time.

The programme offers four major areas of activities:

- Cultural recovery and maintenance of the towns.
- Environmental education for sustainable development.
- Health.
- Enjoyment and coexistence.

Different workshops on environmental education, animation, anthropology, carpentry, ceramics, corporal expression, dances, health, recycling, video, and photography all help in fostering the development of the mentioned areas. In addition, the towns in general have the following spaces: houses for students and teachers, a dining room and screening room, museums, a library, an outdoor auditorium, a greenhouse, etc.

Within the framework of the development of this programme, each participating institution has a period of between 7 and 10 h a week to put into practice its participation project, which should also reflect the previous activities that the teaching staff will carry out with the group.

14.3.6 Environmental Citizenship through Applied Community Service Learning, Afghanistan, Asia

Environmental citizenship through applied community service learning is a project developed in Afghanistan and seeks to incorporate environmental citizenship and community service learning into curriculum models in formal education or as extracurricular activities in non-formal settings. This project seeks to advance innovation in teaching, learning, and action within school systems- based on local contexts and cultures – for students and communities to create and maintain a more sustainable and peaceful environment. The project's mission is to empower youth and university students to design their own environmental service project in their local com-

munity and develop exceptional leadership, citizenship, and post-graduate employment skills.

Community service learning pedagogy has strong connections with citizenship education and place-based education and has been adopted in many higher education curriculums worldwide. A wide range of disciplines such as business, engineering, sociology, tourism, environmental studies, have integrated Citizenship Education which can contribute towards the "development of student, faculty, university, and community interactions and capacity in a progressive and transformative manner" (Franklin and Mosavi 2017).

14.3.7 The Africa Environmental Education and Training Action Plan (AEETAP) 2015–2024

To address the challenge of environmental degradation within the African continent, UN Environment, in collaboration with other stakeholders, is promoting capacity development for future professionals through environmental education. The Africa Environmental Education and Training Action Plan (AEETAP) 2015–2024, is one of UN Environment's modes of facilitating and promoting environmental awareness, education and training in both formal education and non-formal settings. The Action Plan seeks to promote environmental citizenship through Community/citizenship education programs. Innovative and exciting youth community citizenship programs started to be developed to enthuse youth and their communities to participate in sustainable development actions. These programs are most often provided by NGOs and other community based organizations. These programs seek to empower for out of school youth to become actively engaged in environmental and sustainability related citizen and green economy activities.

The Action Plan advocates for ecosystem resource management; communication and dissemination of environmental material in all forms of education; spatial planning and urban design through green campus designs; sustainable tourism and efficient transport; and water and sanitation, among other green practices (Lotz-Sisitka et al. 2017).

14.4 Challenges Regarding the Secondary Age Level and the Non-formal Focus and Suggestions for Overcoming Them

Some challenges arise due especially to the novelty of the concept of Education for Environmental Citizenship. However, some challenges are not exclusive to Education for Environmental Citizenship, but are encountered with regard to EE and EfS. However, since Education for Environmental Citizenship is a contempo-

rary development of these educational philosophies, the challenges they encounter extend also to Education for Environmental Citizenship.

Challenge 1: Reconnection with Nature
Reconnecting people with nature can function as a treatment for the global environmental crisis (Ives et al. 2018). Studies have shown that the number of citizens who are unable to link simple ecological and environmental measures to human needs or resources is increasing. A great challenge is to connect our young people to their society and their environment (to take them from the realm of their comfort to the unknown outside). For younger generations, nature is more a abstraction than a reality (Louv 2008). At a time when young people are less connected with their own neighborhood than with peers in other countries (via social networks), we need to encourage youths to leave their homes and experience their neighbourhood reality. Non-formal education programmes need to improve reconnection to nature from the following aspects: (1) material, (2) experiential, (3) cognitive, (4) emotional, and (5) philosophical (Ives et al. 2017). Visiting local natural areas needs to be exploited. Nature promotes youth creativity, stimulating all senses. Youth need to reconnect with the local habitat to feel it as part of their environment; it does not matter if this is a pond, a grassland, or a forest.

Challenge 2: Society's Rules and Youth Formal Participation
Adult society's rules often institutionalise young people's discrimination as they have not yet the legal adulthood to act as citizens. One Education for Environmental Citizenship goal is to teach young people how to use democratic tools to assert their rights. However, in practice, they are generally unable to do so without an adult, leading to a sense of helplessness. It is interesting to see how desperate a teenager is when he or she discovers that they cannot do something because of 'adults' rules'. In theory, all citizens are equal, but youth citizens are clearly not equal in democracies in terms of formal participation, at least until they reach the legal age (Manning and Ryan 2004). In order to reduce this feeling, it is also important to give them tools to overcome barriers. Mentoring programmes with university students could be part of the solution and create a connection with the following educational level. Moreover, connecting with elderly programmes and society can promote the intergenerational collaboration for EE. Alternatively, it is important to expose young people, via the non-formal educational platform, to those areas of civic participation in which they can contribute to promoting social change.

Challenge 3: Developing a Pedagogical Framework for Non-formal Education for Environmental Citizenship
A pedagogical framework promoting Education for Environmental Citizenship in non-formal settings should be developed and evaluated. The EEC pedagogical framework should contribute to the development of youths' knowledge, skills, and competencies needed to become ecologically and socially responsible environmental citizens. Best practices based on the Education for Environmental Citizenship pedagogical framework can be developed by expert educators in Education for Environmental Citizenship providing non-formal settings and institutions learning

experiences and pedagogies that might build students' competencies for deep civic participation, contributing to environmental and social change.

Challenge 4: Educators' Motivation and Professional Development on concerning Education for Environmental Citizenship

Teachers play a key role in the impact of students' knowledge, values, attitudes, actions and their citizenry towards the environment, thus influencing the outcome of the observed environmental challenges (e.g.: Hungerford 2010; NAAEE 2010; Yavetz et al. 2009; Desjean-Perrotta et al. 2008). Pre-service and in-service training is therefore of particular importance to empower educators to act as formative agents of Environmental Citizenship. This raises questions that need to be answered in order to facilitate educators' engagement in the new initiative of Education for Environmental Citizenship: What competences should educators have in order to be able to engage in Education for Environmental Citizenship? Which Teacher Professional Development models or educational strategies are the most appropriate to train educators for Educating for Environmental Citizenship?

Challenge 5: Time Availability

Getting youths to participate in non-formal Education for Environmental Citizenship is limited by time availability. Non-formal Education for Environmental Citizenship needs to fit into the tight schedule of today's youth, which differs from that of previous generations (Kleiber and Powell 2005). The time required for non-formal Education for Environmental Citizenship needs and the free time that young people have will impact and shape the structure and communication of any non-formal programme. In order to solve this drawback, the use of weekends could be an alternative, leading to the importance of family involvement.

Challenge 6: Networking

Within Education for Environmental Citizenship, networking is as a crucial component for achieving environmental change due to its characteristics. For example, networks promote a multidirectional and more symmetrical form of communication. Moreover, networkers want to evolve together with their network partners (at the same time) which encourages them to progress. This is a positive metaphor for the reciprocal relationship between the individual and society and can thus enhance the social responsibility required of environmentally responsible citizens (Goldman et al. 2017).

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Chapter 15
Education for Environmental Citizenship: The Pedagogical Approach

Andreas Ch. Hadjichambis and Demetra Paraskeva-Hadjichambi

15.1 The Need for Education for Environmental Citizenship

Despite its importance Environmental Citizenship has been under-explored until the last few years (Dobson 2007). Due to the complexity of the concept, Environmental Citizenship was not clearly defined and framed (Environmental Evidence Australia 2012) in relation to other concepts such as environmental behaviour, environmental attitudes, environmental literacy, environmental education, environmental knowledge, awareness and sustainability. In addition, the fragmented nature of the research findings and information related to Environmental Citizenship constraint its effective incorporation into educational practices and frameworks.

However, this comprehensive concept has been elucidated from collective research efforts and Environmental Citizenship has been conceptualized (ENEC 2018). Environmental Citizenship is an umbrella concept that encompasses an array of characteristics such as the skills, knowledge, attitudes, values, and beliefs needed to address environmental problems, as well as all the competences needed for civic engagement and active participation in societies.

Several chapters of this book maintain that in view of the development towards more sustainable societies, citizens need to be supported to overcome challenges in taking part in sustainable societies. In addition, within a sustainable society young people need to understand that they could and should have a political role beyond the legal frameworks of representative democracies; as young people they are also citizens rather than 'future citizens'. Empowering people to become environmental citizens is crucial for addressing current environmental issues and a necessary

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condition of sustainability, which is identified as one of the EU's priorities (EEA 2015). Therefore, educating individuals and communities to become Environmental Citizens is a contemporary challenge if we are to achieve sustainable development and preserve our natural environments. If we are to educate individuals not only to act pro-environmentally, but to understand the urgency of environmental issues and to integrate pro-environmental actions into the core of their political participation and citizenship expressions, all aspects that comprise Environmental Citizenship need to be tackled specifically, systematically and precisely with in educational dimensions.

Therefore, there is an imperative need for the establishment of Education for Environmental Citizenship: an integrated education that could empower students to become responsible environmental citizens, via pedagogies which may build students' competencies for deep civic participation. Through this route Environmental Citizens could ultimately contribute to environmental and social change.

15.2 The EEC Model: Goals and Objectives

The ultimate goals and objectives of Education for Environmental Citizenship should be determined from the outset. The pre-existing literature provides a very important basis for this purpose. Education for Environmental Citizenship should initially identify what we mean by the term Environmental Citizenship from an educational perspective. Certainly, Education for Environmental Citizenship should ultimately identify a coherent and adequate body of knowledge (and categories of knowledge) as well as the necessary skills, values, attitudes and responsible/active behaviours that an Environmental Citizen should be equipped with in order to be able to act and participate actively as agents of change in the private and public sphere, on a local and global scale, in individual and collective actions, in the direction of solving contemporary and future environmental problems, in preventing new environmental problems, in achieving sustainability, and in ameliorating the environment and restoring relationships with nature (ENEC 2018). It should also empower new Environmental Citizens to engage in critical collectives and to participate consciously and critically in ideology, collective, subjectivity, praxis spheres (Johnson and Morris 2010).

This educational effort should not be seen as an imposed external behavioural change of Environmental Citizens (see criticism of individualistic behaviouristic approaches in Chawla and Cushing (2007), Robottom and Hart (1995) but as an educational process for the emergence and development of values and beliefs (Dobson 2007), which are suppressed in the separation from nature and the environment and social isolation. Education for Environmental Citizenship should prompt young citizens to identify the underlying structural causes of environmental problems (Barry 2005), demonstrate the willingness and the competences to engage and participate in the way to democratically advance these structural causes (acting

individually and collectively) in the frames of a critical active Environmental Citizenship and inter-generational equality (Hadjichambis et al. 2015).

According to the definition of Education for Environmental Citizenship (ENEC 2018) there are eight *main intended outputs* of the Education for Environmental Citizenship in non-hierarchical order:

- Solving current environmental problems.
- Preventing new environmental problems.
- Achieving sustainability.
- Developing healthy relationships with nature.
- Practising environmental rights and duties.
- Identifying structural causes of environmental problems.
- Achieving critical & active engagement and civic participation.
- Promoting Inter- & Intra-generational justice.

Following the definition of Education for Environmental Citizenship, potential actions that Environmental Citizens could undertake are of *two dimensions*: individual and collective, and those actions should be applied in *different spheres*: private and public spheres. Environmental Citizenship actions are acknowledged as actions in the public sphere when they affect the relations in societies, and as actions in private spheres when they affect the relations between individuals and societies (Postma 2006). Figure 15.1 presents examples of such Environmental Citizenship actions in a 4-axis system.

In addition, according to the Education for Environmental Citizenship definition, Environmental Citizenship actions can also be applied in *different scales*: local,

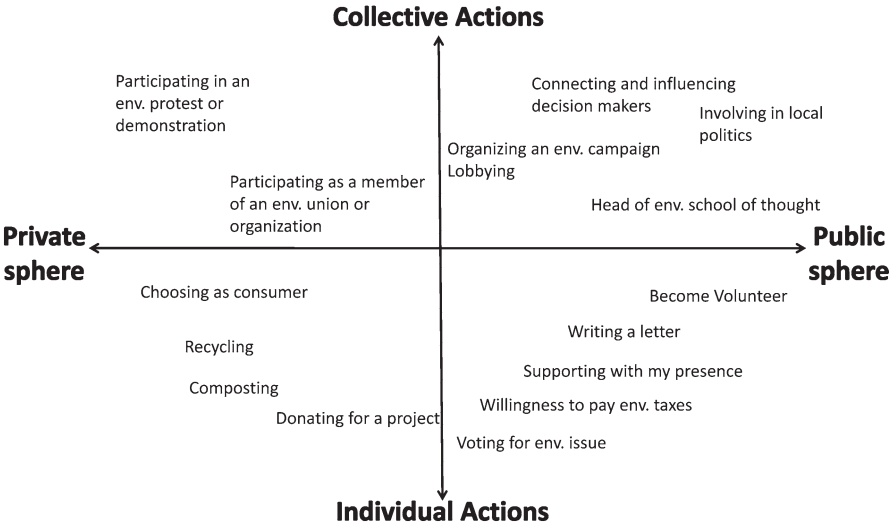

Fig. 15.1 Examples of Environmental Citizenship action in a 4-axis system

Fig. 15.2 The scales of action in Education for Environmental Citizenship

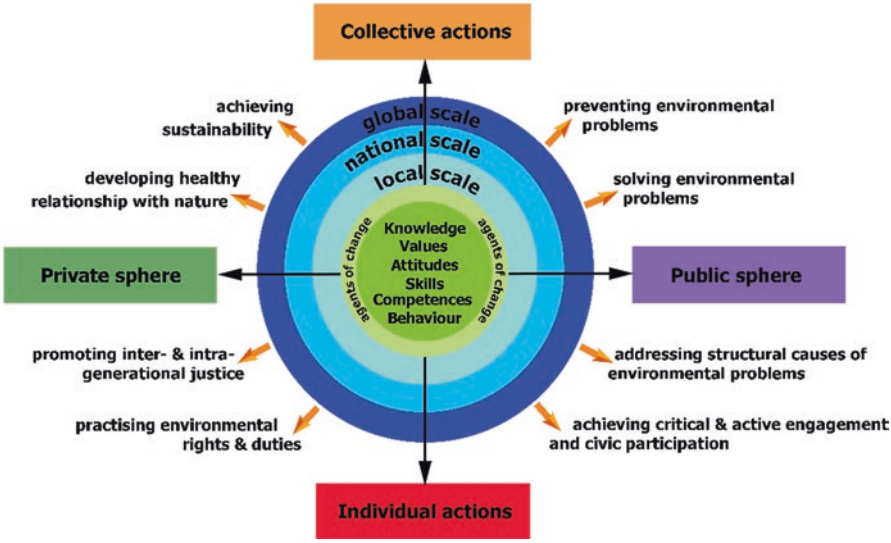

Fig. 15.3 Education for Environmental Citizenship model

national and global scales. The different scales of Education for Environmental Citizenship can be found in Fig. 15.2.

The constitutional elements of the Education for Environmental Citizenship above (Outputs, actions' dimensions, spheres and scales) form the EEC Model which is integrated and illustrated in Fig. 15.3. It should be clarified that the position of each output in the EEC Model does not illustrate its relationship with actions' dimensions, spheres and scales.

The following paragraphs can clarify in more depth the constitutional elements of the EEC Model.

15.2.1 The Green Cycle

At the core of the EEC Model there is a green cycle. This green cycle includes elements of the personal development of an Environmental Citizen. It includes the appropriate knowledge and types of knowledge, values, attitudes, skills, competencies and behaviours that an Environmental Citizen should be equipped with. These components are analysed in other parts of this chapter and this book in general.

15.2.2 Agents of Change

Citizen participation is much more than putting vote in the ballot box. In an active society with a high level of commitment, there are other options for public participation and political influence with the ultimate final goal of producing change in society. "Various types of education and science initiatives around the world have already integrated students' roles as agents of change. They provide evidence that students, indeed, have the potential to be catalysts for enhanced sustainability in their local environment and beyond" (von Braun 2017, p. 27). Agents of change mean that the students are actively participating in the process of decision-making and are also engaged in the following action-taking (Stuhmcke 2012). According to Davis (2009), agents of change also means that students become educators not only for their peers but also for adults and in addition, they also act as catalysts of change. Environmental Citizens have the responsibility to support and foster behavioural changes in different spheres. A good example of students acting as agents of change from global south is the Community-Kura School in New Zealand where youth protested demanding a solution for a local environmental problem and to create a community garden with the support of their teachers and parents. These students appeared confident that with these actions can be powerful on attracting attention to an environmental cause and to effect change (Hayward 2012). The knowledge of how to democratically change a society, and how the social justice effects of those changes on the local and global society, has a central role in EEC Model. In that sense EEC Model can be considered as a change oriented framework by which the content and abilities to really make societal and environmental change for a better world can be fulfilled.

15.2.3 Solving Environmental Problems

Undoubtedly, the twenty-first century could be defined as the era of the global environmental crisis, in which myriads of environmental and social problems call into question the ability of societies to deal with them or to resolve them adequately. These global problems are characterized by complexity, interrelation and

interdependence, and therefore require new approaches in understanding, managing and correlating people's relationship with nature. One of the most important outputs of Education for Environmental Citizenship is its contribution in solving current environmental problems. For Environmental Citizens it is vital to demonstrate willingness and responsibility towards solving environmental problems. Scholars (e.g., Effeney and Davis 2013; Short 2010a, b; Desjean-Perrotta et al. 2008) argue for the importance of involving both students and teachers in authentic environmental problems. However, according to Green et al. (2016), there have been only few projects that highlight the role of citizens and governmental collective bodies in solving environmental problems until now. In order to be able to resolve environmental problems, students need to acquire skills and competencies such as problem solving, social skills (e.g., collaboration, communication), argumentation and decision making skills, critical thinking, systems thinking, scientific or evidence-based thinking, and creative and empathic thinking (e.g, Schusler et al. 2009; Berkowitz et al. 2005; Mintzes et al. 1998; Schauble 1996). Retrospectively, such skills and competences can be cultivated in students if they are engaged in current authentic environmental problems.

15.2.4 Preventing Environmental Problems

The importance of preventing new environmental problems was highlighted in the Tbilisi Declaration (UNESCO 1977). It is aligned with the precautionary principle, which calls for protective actions for the environment even if evidence of harm remains uncertain (Foster et al. 2000). It incorporates willingness and attitudes for eliminating the creation of new environmental problems. For this, the identification of a threat, the understanding of uncertainty, the evaluation of different alternatives and decision making for the appropriate stance or action are all important (Sandin 1999). With these goals the EEC Model is charged to foster Environmental Citizens who are capable and willing to prevent new environmental problems.

15.2.5 Achieving Sustainability

Achieving sustainability is an ultimate task of education for Environmental Citizenship. Principles that underlie sustainability include concepts such as intergenerational equity, social justice, environmental preservation and restoration, natural resource conservation, and just and peaceable societies laying in the three dimensions of environmental, social and economic sustainability (UNESCO 2005). Achieving sustainability, from the Education for Environmental Citizenship perspective, includes also the co-creation of sustainability policy and the active participation of citizens in moving towards sustainability. Those citizens believe that environmental sustainability is the common good, living by the principles and

practices of sustainability, but also having the vision of a democracy more relevant toward sustainability. These citizens are equipped with the appropriate values, worldviews, and prevailing power structures within society as well as the ability to address unsustainability by challenging the current situation (e.g., Dobson 2007; Barry 2005; Schild 2006; Maniates 2001).

15.2.6 Healthy Relationship with Nature

Many researchers have theorised what it means to have a healthy relationship with nature, and many have developed theories and models that they think are more effective to help students develop this kind of relationship. There are important differences and conflicting opinions in the environmental education literature (Verhulst 2004).

A healthy relationship with nature is the result of the connectedness of humans with it. Nature connectedness is the extent to which individuals include it as part of their identity (Schultz 2002). It includes an understanding of nature and everything it is made up of, even the parts that are not pleasing (Nisbet et al. 2009). Characteristics of nature connectedness are similar to those of a personality trait: nature connectedness is stable over time and across various situations (Nisbet et al. 2010).

According to Schultz (2002) three components constitutes the Nature Connectedness construct:

- The cognitive component is the core of nature connectedness and refers to how integrated one understand nature.
- The affective component is an individual's sense of care for nature.
- The behavioural component is an individual's commitment to protect the natural environment.

Verhulst and Colton (2004) state that promoting a healthy relationship with nature requires the development of literacy and citizenship. In addition, Curthoys and Cuthbertson (2002) describe an ecologically literate citizen as "someone who knows about, cares for, and acts on behalf of the cultural and ecological integrity of their home place" (p. 227). Engaging nature experiences, including greening learning grounds, nature-based field trips and journaling, are considered by Curthoys et al. (2004) as effective approaches to achieving healthy relationships with nature. According to Shume (2016) environmental literacy extends beyond conceptual knowledge to describe what is needed for healthy and responsible human relationships with nature.

Recently, reference to a 'healthy relationship with nature' has been made in the fourteenth meeting of the conference of the parties to the convention on biological diversity (CBD 2018). In the recommendations for increased focus on connecting people with nature to inspire enhanced action on biodiversity conservation, it stated that "humans are capable of reversing the trends of the immediate past and present in order to achieve a new and healthy relationship with nature, a relationship that

embodies an inherently regenerative and life-nurturing way of being on Earth. This regenerative relationship, combined with informed and responsible action, will achieve a healing time on Earth. In the process, we will heal ourselves". In the same article (article 27), personal experiences with nature and an understanding of the connected indigenous relationships are considered important in order to increase the understanding of environmental challenges and to develop the appropriate actions needed to address those challenges. For more recent generations, nature is more an abstraction than a reality (Louv 2008). In an era where young people are less connected to their own neighborhood than to peers in other countries (via social networks), Education for Environmental Citizenship considers it a major challenge to connect our youth to society and their environment (taking them from their comfort sphere to the unknown nature outside). Within the EEC Model (Fig. 15.3), empowering youth to develop healthy relationships with nature can function as a treatment for the global environmental crisis.

15.2.7 Environmental Rights and Duties

The knowledge, or even more importantly, the practice of both the Environmental rights (liberal tradition focus) and duties (republican tradition focus) are very important for Education for Environmental Citizenship (Cao 2015). In the context of liberal discourses, Environmental Citizenship emphasises the environmental rights of individuals such as the right to clean air and clean water (Hayward 2000). In addition, environmental liberalism has tried to claim that it attributes rights to the non-human nature, which obliges the political system to support these rights (Dagger 2006). On the other hand, in the context of civic republican discourses, Environmental Citizenship emphasises the citizen's obligation to work for the common good, underlining that environmental protection is part of this common good. Thus, citizens have three main duties: (a) to work against anything that damages the civic identity and engagement of citizens; (b) to be aware of individual and collective actions that affect the state of the environment; and (c) promote decisions of the common good over individual interests (Schild 2016).

Education for Environmental Citizenship emphasises that Environmental Citizens should be able to practise their environmental rights and duties, taking into account that both rights and duties may remain unfulfilled "as long as persons do not have the capacity to act in a civil society" (Stec et al. 2000). The practice of environmental rights and duties from Environmental Citizens is an important component of the EEC Model. Some examples of environmental rights and duties promoted by the EEC Model are listed in Table 15.1.

Table 15.1 Examples of environmental rights and duties

Environmental rights and duties
Right to life and to a pure environment for every human being
Public access on environmental data and information (Aarhus convention)
Practice the right for public participation
Public access to justice
Good environmental governance
Need for environmental impact assessment and strategic Environmental assessment documentation
Public consultation
Obligation not to cause environmental impacts
Inter- and intra-generational equity
The polluter pays principle
Applying the precautionary principle
Applying the subsidiarity principle

15.2.8 Structural Causes of Environmental Problems

Environmental degradation is a result of the dynamic inter play of socio-economic, institutional and technological activities. Environmental changes may be driven by many factors including economic growth, population growth, urbanisation, intensification of agriculture, rising energy use and transportation. Barry (2005) argues strongly about the importance of civic engagement with the structural causes of environmental degradation and destruction. According to the same scholar, it is not enough for the citizen only to try to solve an environmental problem or to restore a degraded environment. An Environmental Citizen is also required to be able to identify the structural causes of the environmental problem and work adequately and democratically to address them.

The EEC Model highlights the importance of helping students understand the structural and systemic causes of contemporary environmental and social problems. The political responsibility for citizens is to promote structural changes, for instance through active participation in deliberations on the values that ought to guide society and policy making (Achterberg 2002; Barry 1999). It is suggested that environmental issues need to be re-politicized such that the underlying structural and institutional drivers of these problems are highlighted.

15.2.9 Civic Participation

Fundamental for Education for Environmental Citizenship is the civic participation of students. Education for Environmental Citizenship should empower students with the skills or competencies necessary to take part in collective actions, participatory processes and critical and active civic engagement. This type of civic

participation equips individuals to take part in the democratic processes in order to respond to the imperative need for sustainability. It includes the socio-political participation in relevance with the structural causes of unsustainability and the actions needed to achieve sustainability.

Civic participation can operate at any level of community and in any community organisation and context (including schools). Three sub-domains of civic participation can be identified: Decision-making, Influencing, and Community participation (Schulz et al. 2016). The critical praxis of Environmental Citizenship implies elements of critical pedagogy (e.g., Freire 1987) and a capacity to critically examine and assess the complexities, patterns and politics that promulgate local and global environmental problems.

15.2.10 Inter- and Intra-Generational Justice

It is vitally important to see that Environmental Citizenship is a matter of justice, not of charity (Dobson 2007). It includes as important both inter-generational justice and intra-generational justice. Inter-generational justice elaborates the justice between different generations, focusing on the necessity to take into account the needs of the future generations. Intra-generational justice explains the issues of justice and injustice within one generation (mainly refers to current generations).

Inter-generational justice is fundamental for sustainability. Future generations have the right to fulfil their demands and requirements. A key sustainability question is "what kind of world do we want to hand on to future generations?" The environmental rights and duties of the Environmental Citizen extend from one generation to another.

In the EEC Model, intra-generational justice includes as an important element of social justice within the boundaries of the state. In addition, intra-generational justice goes beyond the territorial boundaries of the state and sees justice and injustice on a global scale. It incorporates the global south, including indigenous populations, in the debate of the fairness of the distribution of environmental goods, and the participation and the co-creation of sustainability policy, among others.

An example of a campaign examining cases of injustice is the "Sea of hands campaign for recollination" from Australia, in which students gain skills to listen empathically with compassion. This campaign aimed to foster greater understanding of shared public citizenship responsibility for past cases of injustice of war, colonisation, domination and genocide (Hayward 2012).

15.3 The Pedagogical Approach of Education for Environmental Citizenship

15.3.1 The Pedagogical Landscape of Education for Environmental Citizenship

It is important to define the pedagogical landscape in which Education for Environmental Citizenship lies. Some existing pedagogical approaches are important for Education for Environmental Citizenship because they contribute to some extent to its scope and aims. The following pedagogical approaches are forming the pedagogical landscape of Education for Environmental Citizenship (Fig. 15.4):

- Place-based learning.
- Problem-based learning.
- Civic ecology education.
- Pedagogy for eco-justice.
- Action competence learning.
- Community service learning.
- Participatory action research.
- Socio-scientific Inquiry-based Learning.

Place-based learning boosts students' engagement, academic achievement and a sense of efficacy as stewards of the nature and the environment. It incorporates local social and environmental organisations and can contribute to resolving local environmental issues (Smith 2007; Gruenewald 2014). The strength of place-based

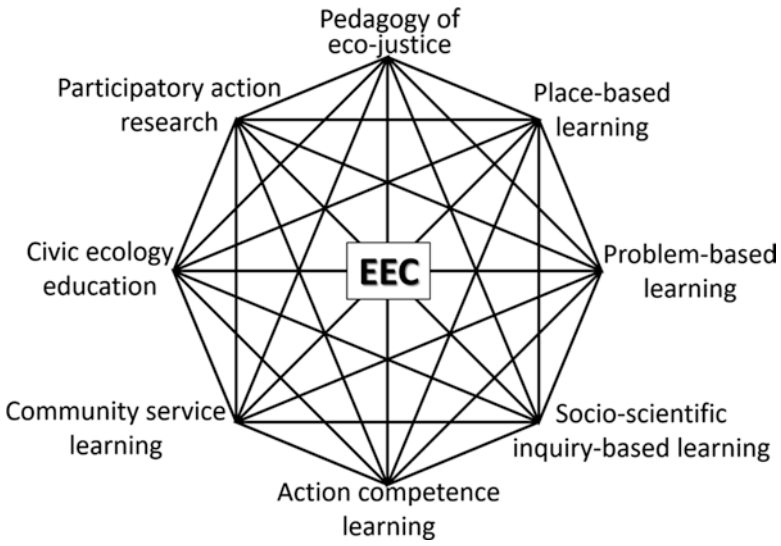

Fig. 15.4 The pedagogical landscape of Education for Environmental Citizenship

education within Education for Environmental Citizenship lies in its ability to offer students authentic opportunities to participate in effecting positive change within their local communities, thereby leaving students with a higher "sense of their own agency and collective capacity" (Smith 2007, p. 192). ***Problem-based learning*** can contribute to Education for Environmental Citizenship because it organises investigations and inquiry focusing on authentic and real life problems. Authentic real life experiences foster active learning, support knowledge construction and integrate school learning and real life (Association for Supervision and Curriculum Development 2005; Barrows 1994).

Civic ecology education can provide another example of how Environmental Citizenship could be promoted in formal and non-formal settings. Civic ecology focuses on stewardship practices within natural and anthropogenic environments. These approaches create real-life contexts for management of resources, enabling an experiential and participatory learning, while also enhancing environmental and social improvements (Krasny and Tidball 2010). ***Ecojustice pedagogy*** also offers a valuable pedagogical tool in Education for Environmental Citizenship that helps to ground epistemological elements of ecological thinking in meaningful praxis. It includes out of classroom activities so that students can experience the knowledge of different cultures, bridges western scientific knowledge with traditional ecological knowledge, and adds an ecological lens to social justice (Bowers 2001). Pedagogy for eco-justice contributes to Education for Environmental Citizenship as it focuses on social justice and works to replace attitudes with the metaphor of ecology promoting a healthy relationship with nature. ***Action competence learning***, as an educational approach, aims not to modify specific behaviours like recycling or saving water, but rather engages youth in planning and taking action on environmental issues they find relevant. It also involves shared decision making, which occurs when adults and youth collaborate in planning, implementing and evaluating a project, whether the project is initiated by youth or adults (McGill and Brockbank 2004; Revans 1998). In addition, according to Schusler and Kransy (2015) environmental action occurs at the intersection of youth civic engagement and inquiry-based education. ***Community service learning*** is important in forming the Education for Environmental Citizenship landscape because it brings the connection with the community and community organisations and integrates the collaboration of the members of community organisations with educational institutions (Hayes 2006).

Furthermore, ***participatory action research*** imports substantial elements to the pedagogical landscape of Education for Environmental Citizenship (Fig. 15.4). It specifically includes aspects of social learning in a way that true participation through research will bring social change (Moore 2005). Finally, ***Socio-Scientific Inquiry-Based Learning (SSIBL)*** is another pedagogical approach that can foster democratic citizenship in general, and Environmental Citizenship in specific formal and non-formal settings (Levinson et al. 2017; Amos et al. 2018). SSIBL connects inquiry based learning in socio-scientific issues with citizenship education. It draws together three interacting pillars – Inquiry Based Science Education (IBSE), Socio-

Scientific Issues (SSI) and Citizenship Education (CE) – within the umbrella of Responsible Research and Innovation (RRI). It includes raising authentic questions about controversial issues [Ask], integrating social and scientific inquiry to explore these open-ended questions [Find out], and formulating solutions which help to enact change [Act] (Levinson and PARRISE consortium 2017; Amos et al. 2018).

In conclusion the above pedagogical approaches can importantly contribute to Education for Environmental Citizenship, however, none of them alone can promote the scope and aims of the EEC Model and its outputs (ENEC 2018). In addition, Education for Environmental Citizenship integrates and builds upon pre-existing types of education such as Environmental Education (EE), Education for Sustainable Development (ESD), Science Education (SE) and Citizenship Education (CE) (Fig. 15.5). Education for Environmental Citizenship advocates a need to move beyond a central focus on individual attitudinal and behavioural changes towards collectively building a better understanding of environmental learning processes aimed at socio-ecological change. A need for Education for Environmental Citizenship Pedagogy arises which could collectively develop in today's youth the knowledge, skills, and competencies needed to be ecologically and socially responsible Environmental Citizens. There is a need for Education for Environmental Citizenship Pedagogy that could provide learning experiences to build students' competencies for deep civic participation contributing to environmental and social change.

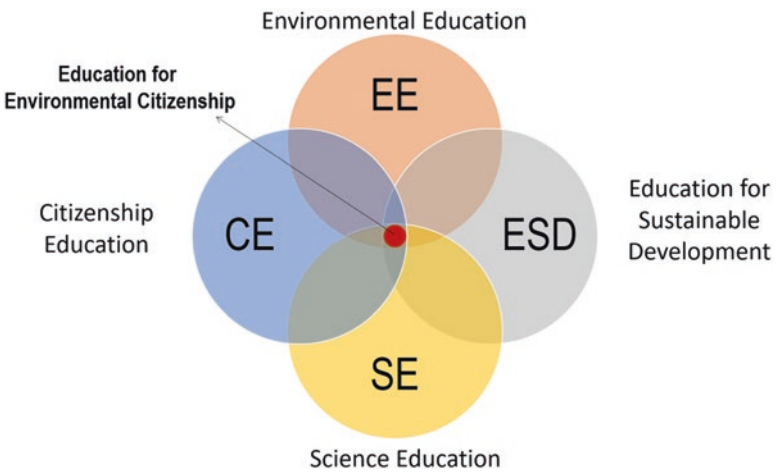

Fig. 15.5 Education for Environmental Citizenship and other types of education

15.3.2 Description of the Education for Environmental Citizenship Pedagogical Approach

It is important here to identify the pedagogy that needs to be at the heart of Education for Environmental Citizenship and can adequately promote the EEC Model. The suggested pedagogical approach is one of the possible venues that could promote Education for Environmental Citizenship. Of course other pedagogical approaches could also be proved suitable to promote Education for Environmental Citizenship. The starting point is a local environmental problem which draws on students' interests and concerns, a problem that their community faces and they feel that they have to do something about it. A starting point could also be a global environmental problem with some local symptoms making students feel relevant and able to act as agents of change as described earlier in the chapter. Students' interests could be stimulated using prompts such as pictures, videos, controversial news items.

The Education for Environmental Citizenship Pedagogical Approach includes six (6) stages: Inquiry, Planning actions, Critical & active engagement and Civic participation, Networking & Sharing in Scales (local, national, global), Sustain Environmental & Social Change, and finally Evaluation & Reflection (see Fig. 15.6). These stages are not in a strict linear sequence and an entry point can be any one of the six which feeds better to the case. Each of these stages includes different steps which all together integrate the Education for Environmental Citizenship Pedagogical Approach as a comprehensive and holistic pedagogy. However, it is important to emphasise that for either a teacher or student team it is not compulsory to apply all the steps that are proposed below.

Inquiry stage includes five (5) steps: Data collection and analysis, Structural causes, Inter- & Intra-generational injustice, Value clarification, and Outdoor place-based activities. During this stage students are going to carry out the data collection and analysis which are necessary for the exploration of the environmental problem studied. These data are important in order to have scientific evidence for their argumentation. Examples include data regarding the ecological importance of the relevant ecosystem, biodiversity data, climatic data, or social and economic data related to the environmental problem studied. In addition, students should gain some information regarding the *structural causes* of the environmental problem under study. For example, ineffective environmental laws or ineffective procedures to protect nature, conflicting interests for a development or prioritising economic development against the protection of the environment. An important step for students at this stage is to examine cases of *Inter- & Intra-generational injustice* relevant to the environmental problem in focus. For example, students could observe accumulation of wealth to specific developers (Intra-generational injustice) or infringement of environmental rights and duties or even that future generations will be deprived of some ecosystemic services (Inter-generational injustice). *Value clarification* is also important at this stage. Students raise fundamental questions relating to the underlying values behind the environmental problem studied. For example, which values underpin various stakeholder groups' dispositions (e.g. developers, students,

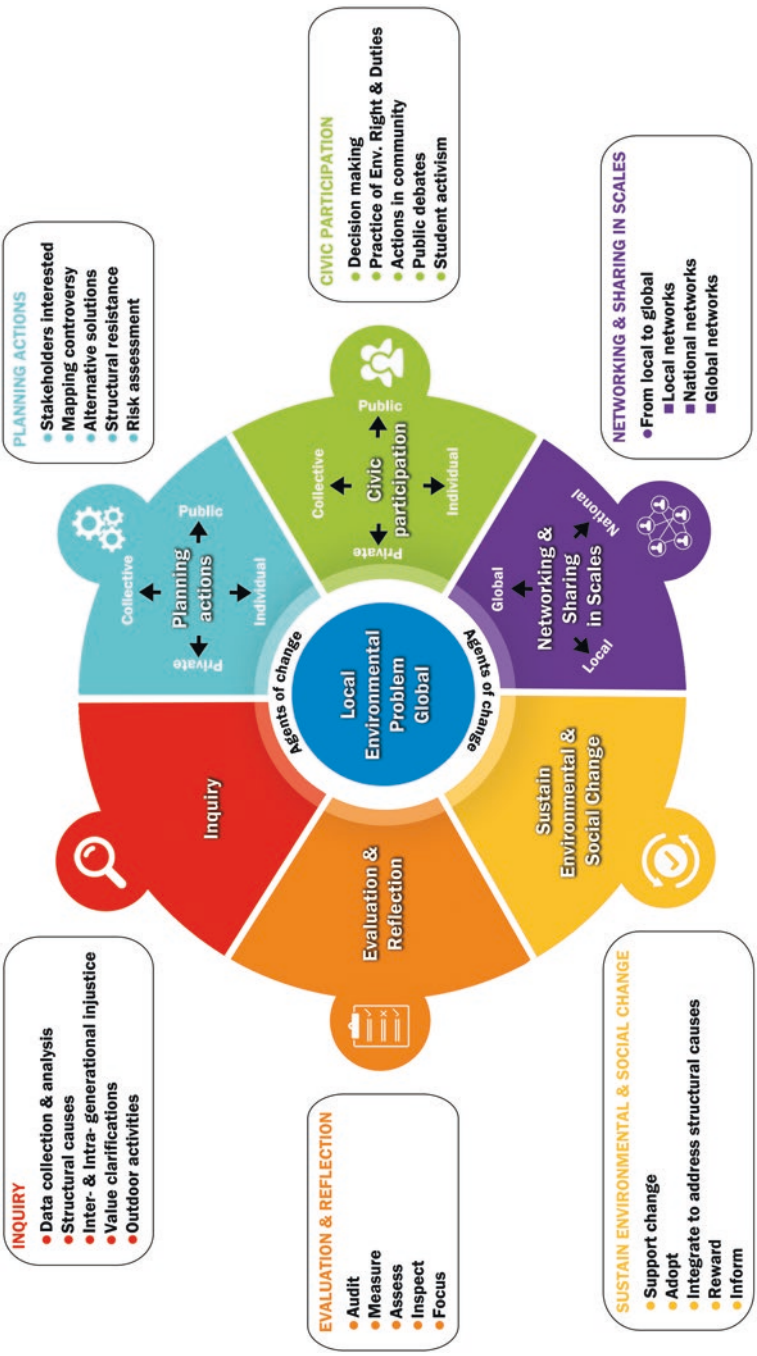

Fig. 15.6 Education for environmental citizenship pedagogical approach

environmentalists etc.)? Finally, *outdoor place-based activities* could be included giving students a sense of efficacy as stewards of the nature and the environment and increasing their engagement and feeling of relevance.

Planning actions is another essential stage of the Education for Environmental Citizenship Pedagogical Approach. In this stage students are asked to plan individual and collective actions in private and in public spheres. Identification of the *relevant stakeholders* with the specific environmental problem is core. For example, for a local environmental problem the relevant stakeholders could be developers, ecologists, students, government, neighbours. *Mapping controversy* is another step in this stage. Mapping stakeholders' positive and negative arguments and the interrelationships of the stakeholders and their arguments are crucial for students to understand the complexity of the environmental problem studied (e.g., Latour 2005). Recording and examining possible *alternative solutions* for the environmental problem studied is another step in this stage. The examination of the positives and negatives of each alternative solution could be undertaken in the frames of sustainability (environmental, social, economic sustainability). In a next step, students could investigate the *structural resistance* that could face a proposal and (Paraskeva-Hadjichambi et al. 2012). Some examples of possible structural resistance that could be identified include the resistance from the system, the non-elastic laws, conflicting interests and interference, and the economic conditions conducive to growth at the expense of the environment. Finally, at this stage a risk assessment could be very important for the students. Risks should be identified in advance so students can be ready to handle them. Some examples of risks could be upset and confrontation in the community or blaming on personal and collective level.

Civic participation is a vital stage for Education for Environmental Citizenship Pedagogical Approach. *Decision making* is, according to Schulz et al. (2016), the first and important component of civic participation. In this step, students need to make decisions keeping in mind alternative solutions (Paraskeva-Hadjichambi et al. 2015). In this step students can also decide to contact scientists, environmental organisations, politicians and other stakeholders to present their views, suggestions and decisions for the specific environmental problem. Another step in this stage is the *practice of environmental rights and duties*. Examples of such rights and duties can include access to environmental data and information, the right for public participation and consultation, the public access to justice, the need for environmental impact assessment, and strategic environmental assessment documentation. The next step is the application of *actions in community* including individual and collective actions in private and public spheres. Students could proceed to organise a campaign-lobby or donate towards a campaign and the protection of the environment, become volunteers, publish an article in a local newspaper or participate in radio and TV broadcasts regarding the environmental problem and the possible solution. These are only some examples of the possible actions in the community. Organising or participating in a *public debate* could be another possible step. Public debates have proven to be very beneficial both in students' education but more importantly in helping students to practising citizenship (Hadjichambis et al. 2018; Owens et al. 2017; Gregory and Holloway 2005). Finally, organising and

participating in other forms of *student activism* are also important. Informing campaigns for peers, families, communities and the general public, organising and participating in protests or demonstrations could give opportunities for students to practise different forms of civic participation that could prove beneficial for their development in terms of knowledge, skills, competencies, self-efficacy, self-esteem, and socio-political empowerment (Baptista et al. 2018; Marques and Reis 2017; Schusler and Kransy 2015; Simonneaux 2007). In addition, it has been proven to be beneficial for environmental and social transformation (Bencze and Sperling 2012; Freire 1987).

Networking & Sharing in Scales is an important stage for the Education for Environmental Citizenship Pedagogical Approach. Students can organise *local networks* of students, scientists, volunteers, supporters, activists and politicians. In this way students can influence their local community and encourage local communities to realise the importance of the environmental problem studied. Students can also upgrade the discussion of the specific environmental problem to a national scale. The development of *national networks* also by students, scientists, volunteers, supporters, activists, politicians and others can help in this direction. Connecting with national environmental NGOs is also important in this step. Finally, students can attempt to inform the global community for the environmental problem which is under study. They can try to create *global networks* of action mobilising students, scientists, volunteers, supporters, activists and politicians in other countries in a global action dimension. Connecting with international NGOs is of outstanding importance. The recent global movement for climate change (e.g. FFF - Fridays for Future, a global weekly day of climate activism involving students) proved that this attempt is possible. Social media, social networks, blogs and other recent information technology applications can be very influential in such attempts (Gerbaudo 2018). According to Aday et al. (2010), social media is often used as a means of representation, and also as a tool for 'citizen journalism', such as the use of web live streaming services or a YouTube video that elicits episodes of police brutality. What is most interesting is their use as a means of organising collective action and more specifically as a means of mobilisation (Lievrouw 2011). Therefore, social media can be used to organise and promote international campaigns.

Sustain Environmental & Social Change is the stage of Education for Environmental Citizenship Pedagogical Approach where supplementary efforts are taking place in order to sustain environmental and social change. In this stage students could *support* and *improve* the previous actions, for example keeping the issue in the news and they could *adopt* new reinforcing measures and actions. Another important step in this stage is to *integrate additional actions to address structural causes* in other areas and in other levels. An example is where students send official letters to parliament or an official letter to the Minister for the Environment reporting an environmental policy deficit. This could be a deficit of current environmental legislation, a deficiency in the implementation of environmental legislation, a deficiency of environmental structures and infrastructures or even deficit of environmental 'culture'. In another step, students could *reward* those who helped in their actions (e.g., students, volunteers, supporters) by sending, for example, a letter of

thanks. Finally, they can *inform* the public of their success and disseminate successful actions.

Evaluation & Reflection is the last stage included in the Education for Environmental Citizenship Pedagogical Approach. Students can *audit* the success of different actions (e.g. demonstrations, official letters). They can *measure* several achievements (e.g., knowledge of students before and after, attitudes of students before and after, values of stakeholders or of the community, skills and competencies before and after the intervention). Students can also *assess* the efficiency of their applied Education for Environmental Citizenship Pedagogical Approach, and inspect hidden dimensions of the procedures and steps of the applied approach. Finally, students can *focus* on positives and negatives of the applied Education for Environmental Citizenship Pedagogical Approach and lessons learned.

15.4 Curriculum and Learning Materials for Education for Environmental Citizenship

Environmental Citizenship is not commonly dealt with in current textbooks, curricula, learning materials, and frameworks. Important guidelines for Education for Environmental Citizenship could be envisaged through Curriculum and Learning materials. What are the characteristics necessary for curricula to promote Education for Environmental Citizenship? What kind of learning materials, programmes, curricula, scope and educational tools and instruments are necessary for Education for Environmental Citizenship? What are the differences in the educational context of several countries and which cases could serve as good practices to learn from?

Education for Environmental Citizenship could enrich curricula with an innovative, integrated and holistic perspective combining knowledge, skills, values and beliefs, attitudes, and behaviours with individual and collective environmental action in private and public spheres as previously described. Such a perspective reinforces the teaching of education for sustainability with a novelty not always found in other areas of the curriculum (Stokes et al. 2001). This removes the walls that isolate the school from society and science and allow for the elaboration of important partnerships between school, science and society. Apart from the philosophy and general purpose, the curricula should also incorporate methodology, differentiation in the several levels from early childhood to higher education, and any educational sector from formal to non-formal and informal settings. The ways of assessing and measuring the outcomes of Education for Environmental Citizenship is also of crucial importance. Teaching Attainment Targets and Indicators of Competence for Environmental Citizenship will embody curricula with even greater efficiency. Due to the innovation of Education for Environmental Citizenship, it will be important to identify some best practices as successful learning materials, programmes and projects.

Engaging students in authentic controversial environmental socio-scientific issues that need a solution could be of great importance. Environmental education which focuses on authentic inquiry and action as well as on civic engagement and participation is more appropriate for the development of the Environmental Citizenship needed to achieve sustainability (Berkowitz et al. 2005) and responsible research and innovation. The Education for Environmental Citizenship curricula is important to provide opportunities for students to act as environmental citizens. Assessment of Education for Environmental Citizenship should take place at different levels from the micro-level to the macro-level, from the individual level to the collective level, and from knowledge to praxis. There is a need to have the appropriate metrics to assess the outputs of Education for Environmental Citizenship on students, groups, classes, educational programmes, schools, communities, educators, the educational community, and even in educational systems. These needs could be an emphasis in future research.

The Education for Environmental Citizenship Pedagogical Approach could be implemented in both formal and non-formal settings as well as in different levels of education (e.g., primary and secondary). Of course, an adequate differentiation should be undertaken according to students' ages, educational settings as well as educational contexts. Future research with empirical studies will shed light in this differentiation of the Education for Environmental Citizenship Pedagogical Approach.

15.5 Teachers and Teacher Professional Development for Education for Environmental Citizenship

Teachers play a crucial role in influencing the knowledge, values, attitudes, actions and their students' citizenry towards the environment and thus influence the outcome of the observed environmental challenges (e.g., Hungerford 2010; Desjean-Perrotta et al. 2008). Pre-service and in-service training is therefore of particular importance to empower teachers to act as formative agents of Environmental Citizenship. However, what abilities and competences should teachers have in order to be able to engage in Education for Environmental Citizenship? Which Teacher Professional Development (TPD) models are the most appropriate to train educators for Education for Environmental Citizenship? Which teacher-oriented strategies could help the establishment of Education for Environmental Citizenship? These are two questions that need to be answered in order to facilitate teachers' engagement in the new initiative of Education for Environmental Citizenship.

A large number of scholars argue for the importance of ecological literacy in teacher education (e.g., Effeney and Davis 2013; Desjean-Perrotta et al. 2008). Well-designed teacher professional development programmes aiming at Environmental Citizenship, in addition to ecological literacy, need to include educational approaches that involve teachers in the process of solving authentic environmental problems (Short 2010a, b). Additionally, TPD programmes should

include place-based practices that allow teachers to realise the scientific, social, economic, political and cultural dimensions of the environmental problems (Gruenewald 2003). However, such projects that highlight the role of citizens and governmental collective bodies in solving environmental problems are rare, and research on environmental action projects in teacher education is limited (Green et al. 2016). According to Green et al. (2016) if we want teachers to connect students to the natural environment and their communities, then it is essential to engage teachers in environmental action projects in the community that prompt them to critically assess the complexities, patterns and politics contained in environmental problems and therefore help teachers to clarify their own values and actions in terms of local and global environmental issues.

Furthermore, teachers' professional development could be situated in practice, and moves from awareness to a progressive refinement of the understanding of the new ideas through cycles of co-design and learning from peers. Co-design is an important element of learning in the contemporary professional development of teachers (Kyza and Nicolaidou 2016; Kyza and Georgiou 2014). In such TPD approach teachers are engaged in multiple roles such as learners, designers, innovators, and reflective practitioners (Kyza and Georgiou 2014), which allow them to better understand their multiple roles and to reflect on their own practices as well as those of their peers (Kyza et al. 2018).

15.6 Educational Institutions and Education for Environmental Citizenship

What is the role of schools in Education for Environmental Citizenship? What strategies should educational institutions and systems apply that can foster Environmental Citizenship? Schools and educational institutions, including those from non-formal education settings such as environmental education centres and natural history museums, should adopt Education for Environmental Citizenship in their daily educational practice. Once the importance of Education for Environmental Citizenship is recognised, it could be integrated into their environmental policy and promoted using a targeted strategic plan. Schools need to realise and accept their role and place in society as agents for change and in the transformation of the environment and society towards a more sustainable, responsible and fairer world in the frames of Environmental Citizenship. Of course there are difficulties as well as obligations in this attempt. School communities should be aware of environmental issues and have the determination and ability to improve environmental conditions. They have one of the most significant roles to play and this is to provide a democratic context for shared values as well as for the development of spiritual and moral dimensions of Environmental Citizenship (Ashley 2000). All these are important because the ability to 'take action' – understood as a conscious action than as an instinctive response – is a prerequisite for actions of Environmental Citizenship (Carlsson and Jensen 2006). In addition, school communities should not focus only on purely

individual action. As Schindel Dimick argues (2015, p. 399) "individual action and consumption show students only limited ways that they can interact with the environment, but there is another way – as the environmental citizen– in which they can act as members of a public that have shared obligations with others to address concerns about the environment and its resources for themselves, for the global community, for non-human life on earth, and for future generations".

The establishment for synergies, partnerships and support from academic institutions, NGOs and other social actors could empower schools and educational institutions to adopt flexible mechanisms for integrating Education for Environmental Citizenship. The adoption of environmental landscapes and ecosystems near the school will strengthen the relationships of the school with the local environment and the local communities, which will not only help students to understand their environment, what is affecting it and its problems, but also to develop participatory behaviours and actions of citizenship to solve these environmental problems.

However, many external factors influence schools and educational institutions such as school systems, professional unions and associations, available instructional materials and resources, standards and the results of assessments, parents, taxpayers, trade associations, educational organisations. These all affect a school's policy and its effectiveness (Hoy and Miskel, 2008) and not always in a positive way. Schools should therefore evaluate these external factors and plan appropriately.

15.7 Conclusion

In conclusion, this chapter highlights the importance of the concept of Environmental Citizenship and the need to reconceptualise it on an educational perspective for twenty-first century education. The chapter strengthens the significance of the integration of Environmental Citizenship in education and introduces expanded ways of thinking as it proposes the establishment of the Education for Environmental Citizenship as a distinct, integrated and holistic educational field with its own aims and primary tasks. It is also an attempt to provide an educational rationale for developing Environmental Citizenship in schools and educational institutions and to lay the foundations of Education for Environmental Citizenship, since it discusses fundamental issues such as pedagogy, curriculum and learning materials, teachers and teacher professional development as well as the role of the educational institutions and schools. Finally, the European Network for Environmental Citizenship (ENEC) is expected to serve as a precursor for the establishment and dissemination of Education for Environmental Citizenship within the research community in the forthcoming years (Hadjichambis and Reis 2018).

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