Chapter 6. Knowledge and Environmental Citizenship

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Abstract

This chapter is planned to examine the relationship of knowledge to environmental citizenship. Environmental knowledge even though does not seem to have a strong effect on environmental behavior is a necessary precondition for pro-environmental behavior and thus for environmental citizenship. However, what types of environmental knowledge is needed which cultivates a coherent and adequate skills, values, attitudes and competences that an environmental citizen should have in order to be able to act and participate in society as an agent of change in the private and public sphere, through individual and collective actions, on a local, national, regional and global scale, in order to solve environmental problems, prevent the new environmental problems, in achieving sustainability and developing a healthy relationship with nature? There are different types of knowledge related, which are discussed in this chapter, such as environmental systems knowledge, action-related knowledge and effectiveness knowledge. Co-production of knowledge between expert and lay citizen is central to the idea of participatory approach and seems to be important for Environmental Citizenship.

Keywords: ''environmentology'', education, knowledge, awareness, responsibility, sustainability, conceptual consciousness, ability to solve problems, natural heritage, cultural heritage

Acknowledgments

Definition of terminology

Education for Environmental Citizenship requires holistic and fundamental aspects of environmental sciences. Environmental science investigates the relationships and interactions of living organisms with other living organisms and surrounding, physical environment (adaptations on the habitat conditions). Environmental science includes all living or non-living things, including physical, chemical and other natural forces. It includes various habitat conditions where living organisms (biota) find and fulfill their requirements, and consists of two components, biotic and abiotic. The Ecosystem defines the interaction within the Environment. It can be described as system of interacting functional units. The system boundary of an ecosystem depends on what we would like to observe (the whole Earth or water drop).

The environmental impacts of modern technology jeopardizes the high standard of livelihood that have brought human kind to the threshold of civilization (Goleman, 2010) and today we are forced to find ways and overcome the knowledge that has been brought to the human race as sensibility, and capacity to recognize and understand the natural systems around us (Rockström et al. 2009). This sensibility, is still present all over the world, most often in the remote, inaccessible parts of the planet of an inborn community, from the native population of the Arctic Circle, through the small village in Tibet, to the Sahara or remote islands in the Pacific, they survive only by understanding the natural systems around them and adapting to them, by designing the ways of life that best communicate with these natural systems (Goleman, 2010). Unfortunately today, in modern society, we are forced to re-acquire knowledge of what should be born to a human species, what is called **ecological intelligence** (Goleman, 2010). It is the wisdom and ability to adapt to our ecological niche, so as to inflict as little damage as possible and re-live sustainably in that niche, and today it is the whole planet.

The concept of environmental citizenship includes environmental knowledge and knowledge of environmental behavior of citizen, citizen knowledge

Over the last few decades the **concept of environmental citizenship**, as an intersection between environment, civil society and the state, has gained prominence both in the domain of environmental policy and in academia. 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 theoretical ideal-type, normative concept, a practical tool or even a practice that should be studied upon. The concept becomes even more complex when environmental citi-

zenship is observed in relation to the opposing political traditions – liberal, republican, cosmopolitan, or environmental discourses – eco-modernization, ecofeminist, radical ecology etc. (Cao, 2015; Hannigan, 2014). Moreover, several related concepts such as the ecological citizenship, sustainable citizenship, green citizenship etc., are on certain occasions used distinctively and, on the others, interchangeably with the concept of environmental citizenship (Dobson, 2003; Barry, 2005; Dean, 2001).

British political theorist Andrew Dobson, one of the most prominent figures in the field of environmental citizenship studies, makes a distinction between ''environmental citizenship'' which he considers to be a liberal and reformist articulation of the relationship between citizens and the environment, and a more radical form that he terms 'ecological citizenship" (Dobson, 2003; Cao, 2015). According to Dobson (2010), **environmental citizenship** could 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. It is about the active participation of citizens in moving towards sustainability". **Ecological citizenship,** on the other hand, "deals in the currency of non-contractual responsibilities, it inhabits the private as well as the public sphere, it refers to the source rather than the nature of responsibility to determine what counts as citizenship virtues, it works with the language of virtue, and it is explicitly non-territorial" (Dobson 2003). Dobson argues for the development of the cosmopolitan ecological citizenship that goes beyond the barriers imposed by the national-state.

Even though the unanimous consensus over the meaning of the environmental citizenship has not been reached yet (Valencia Saiz, 2005), there are some attempts to make a unifying definition that would cover traits common for different interpretations of the relationship between citizens and their environment. For instance, the European Network for Environmental Citizenship (ENEC) established the following definition for environmental citizenship:

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. "Environmental Citizenship" 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 common environmental good.

Environmental education = ''environmentology''

There is an urgent need to boost transition to citizens and communities that are informed, that understand the human impact on the world and that are able and feel empowered to act individually and collectively for sustainability.

This transformation requires a (formal and nonformal) education that is close to reality, that fosters the understanding of what is happening in our world, that develops critical thinking and democratic competencies, that reveals universal values (social justice, wisdom, synergy with nature, equality, innerharmony, responsibility, creativity, self respect, etc), all these elements (reality, understanding, competencies and values) strictly together, has to become part of the learning process.

In this chapter we focus on knowledge, but bearing in mind thought that efforts on fostering knowledge alone in EEC (without links to real life, competencies and values) is insufficient and pointless for the sake of a sustainable world.

Distinction of the meaning of the two words, **knowledge ≠ understanding**, often defines citizens' behavior. This sensitive difference where ''Knowledge'' is about knowing facts, while "understanding" is about understanding how processes work and accordingly the outcome can change, makes the significant change in relationship to the environment. Both are important and necessary for EC. You can teach and educate person, it still doesn't mean that person is educated. Only when the acquired knowledge is applied as a daily behavior model, we can say that it is understood and learned. More than *to know*, is necessary to *understand* (which is knowledge + empathy).

In order to perform environmental rights and duties in a proper manner, citizens need to have an adequate understanding of the environmental challenges and acceptable ways of reducing potential risks and harms. Therefore, **environmental education,** focused on the development of environmental / ecological values, knowledge, skills and competences, should be considered as an important factor in development of environmental citizenship.

EEC needs integrated systems of knowledge which focuses on the understanding of human–environment interactions and on the linking between knowledge and actions for sustainability. The process of knowledge production and how it is "used" in EEC makes the difference for sustainability.

Environmental education can be both formal and informal. Formal education is related to the process of schooling - from kindergarten to university - with environmental courses being a major channel of dissemination of environmental knowledge. 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 the education system (Berkowitz et al, 2005).

Informal education, on the other hand, could be a lifelong process connected to different phases of one's life course. 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 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. However, it should be noted that the scope of informal education is rather limited since environmental citizenship demands for a certain level of civic and ecological literacy. Environmental issues are generally hard to notice and understand as they are usually not detectible without adequate expertise and scientific equipment (Yearly 1992, Hannigan 2014). Lay, "ordinary" environmental knowledge is limited to personal experiences and local issues. Although local practical knowledge can sometimes be very important in alarming scientific community of new environmental threats, as local population tends to be the first to notice changes in the local environment (e.g. the outbreak of the Zika virus), certain level of expert (global) knowledge is essential for environmental citizenship. This kind of knowledge is primary acquired through the process of formal education.

Environmental education should encompass two types of literacy – ecological literacy and civics literacy. Ecological literacy means "the ability to use ecological understanding, thinking and habits of mind for living in, enjoying, and /or studying the environment." On the other hand, "civics literacy 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). This implies that education for environmental citizenship should be interdisciplinary and able to integrate knowledge developed within environmental (natural) sciences with the relevant knowledge coming from the realm of social sciences.

Being aware of the complexity of the environmental knowledge, certain authors proposed a digest curriculum that would be comprehensible for the majority of population. For instance, Paul Risser (1986 cf. Berkowitz et al. 2005) proposes the following four elements: "(1) multi-media transport of materials; (2) clarifying the ''everything is connected to everything'' concept; (3) ecology–culture interactions; and (4) familiar ecological field observations based on a specific, local ''spot." Following Riser, Berkowitz and colleagues (2005) developed a framework consisting of three components: (1) Understanding of five key ecological systems (one's home community (ecological neighborhood) and ecosystem; the ecological basis of human existence; the ecology of the systems that sustain us; the globe as an ecosystem and our impacts on it; genetic/evolutionary systems); (2) Building the disposition, skills, and capacity for ecological thinking (scientific or evidence-based thinking; systems thinking; trans-disciplinary thinking; spatial thinking; temporal thinking; quantitative thinking; creative and empathic thinking); (3) Nature of ecological science and its interface with society.

On the "social" side (civic literacy) of the knowledge that is important for the environmental citizenship, it could be argued that concepts and theories developed within the scope of environmental sociology, environmental psychology and envi-

ronmental political science are of a particular value. This body of knowledge consists of, but is not limited to, the following: environmental values, awareness and behavior, environmental activism and movements, environmental/climate justice, environmental inequality, environmental decision-making, environmental governance, environmental communication and media, risk construction and environmental discourses, etc.

Cohesion

The concept of **environmental citizenship** includes environmental knowledge and knowledge of environmental behavior of citizen. Nowadays there is a need for broader **citizen knowledge** about environment, bearing in mind that it includes natural, social and historical-cultural and economic environment. Ecology and economy can go hand in hand, and sustainability can only last if it is economically viable.

Increasing public awareness regarding the importance of environmental sustainability and the promotion of green values is a way to reinvent knowledge of the environment among the general public, to answer on question how knowledge about human–environment **interactions** can be used to develop practical strategies to encourage pro-environmental behavior and create sustainable environments (interdisciplinary collaboration). We should all have the congenial recognition about **work of environmental systems** and **operation of natural processes**, but civilization brought us to live in more artificial surrounding and to lose the sensibility to natural processes understanding. People became too specialized to particular fields and they are no longer able to see a wider picture and to act in a common sense by their own. Nowadays we have to build new more complex approach to repair everything that we ruined in the environment, which is possible to be repaired, and to achieve sustainable use of remained natural resources. That is the reason for raising awareness of the environmental citizenship, as the way of **integration of the environment into citizenship questions** (extent to which a model of citizenship centered on the individual; comprehend 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 natural system which would be undisturbed by human interventions. This would call for extensive nature protection, protection of nature from human use and over exploitation. Whenever a resource is becoming scarce or a living (biotic) resource in danger of deterioration or extinction, conservation is a reaction which should react by taking out the resource from human use. But in practice resource exploitation for economic goals within a conventional framework of guiding economic ideas is reality. Economic viability is the most important aspect of sustainability, while social and ecological aspects are realized mainly incidentally.

[DF1] megjegyzést írt: I would not blame civilization, its rather the overexploitation of natural resources and destruction of ecological habitats

[M2] megjegyzést írt: It is not blaming, it is reality from which we can not escape, it is a fact, and overexploitation and destruction are consequences

[DF3] megjegyzést írt: In my opinion, these statements are too general and can easily be contradicted; environmental laws (e.g. EIA legislation) exist it almost all countries, so I would reformulate this more carefully

[M4] megjegyzést írt: I don't agree that these statements are too general, at least from my point of view. Citizens see themselves as links in a chain not as a responsible individual.
I tried but I couldn't find better explanation, if someone has better more suitable version please feel free to suggest.

[M5] megjegyzést írt: Excuse me, but I have to say again what I mean. I see that this book is the most appropriate place to explain to people how things really are, this is a reality that most ordinary citizens are not aware of, I think, and I think that this publication is the ideal place to present it. I accept if you disagree with my view and I ask you to state your opinion if you have another proposal.

[M6] megjegyzést írt: Finally, all environmental problems are due to economic reasons. Today environmental issues are solved and understood in economically developed countries, while countries that are striving for economic development continue to prioritize only resource exploitation and are not sensitive to environmental issues because their existence is more important at this point.

[DF7] megjegyzést írt: This statement is also very general and can easily be contradicted, I would formulate this carefully, otherwise we lose credibility;

Types of knowledge

There are different definitions about knowledge observed by different authors. Frick et al. (2004) consider that there are three types of knowledge forms that have to work together in promoting conservation behavior: **System knowledge** (understanding of the natural states of ecosystems and the processes within them), **Action-related knowledge** (when people know what can be done about environmental problems), **Environmental effectiveness knowledge** (knowledge about the benefit (effectiveness) of environmentally responsible actions). There is also fourth kind of knowledge (Hanna, 1995), social knowledge, that is included occasionally, chosen individually based on personal preferences, standards, and existing social ties. According to Frick et al. (2004) knowledge structure is crucial in practice for designing knowledge-based campaigns and educational curricula. It is explained that understanding of a problem (system knowledge), can lead to be able to acquire action-related knowledge, while basic scientific knowledge alone cannot lead to the target behavior, either, but, even if a person knows what actions can be taken, the final decision will be based on effectiveness knowledge. 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 own behavior as a necessary additional input to promote desired behavior in the society and surrounding.

Bruckmeier and Tovey, (2008) proposed four variants of understanding and practicing resource management for sustainable development, and clear differentiation of **types of knowledge** that will be applied in resolving individual approaches to optimal resource management: 1. **Scientific approach** (especially ecological) is used as guiding knowledge in the resource renewal. This approach means management to ensure the renewal of resources as these are used or after use, e.g. sustainable forest management, energy consumption reduction (ecological modernization). 2. **Managerial -** political **knowledge** is guiding knowledge in the quality of life approach. The quality of life approach mean the resource is managed to improve some conception of local quality of life (access to water, fuel, landscape, health). 3. **Local knowledge** is crucial in the management of a resource to provide improved sustainable local livelihoods. 4. Different knowledge forms, scientific, managerial and local become **combined** when the resource is managed through participation or co-operation of all who have an interest in its being sustained. Participatory resource management including local resource-dependent stakeholders, scientists, global actors, resource-dependent animals, became 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 succession of these types is different (Bodorkós *et al.* 2005). Managerial knowledge is often combined with political-managerial knowledge (Bruckmeier and Tovey, 2008).

But we can distinguish also local and global knowledge. Local knowledge is often explained as 'traditional', 'indigenous' or 'ethnic' – the knowledge systems held by local boundary and distinctive cultural groups. While global knowledge is identified with the extension of western sciences and technological knowledge into global. 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 larger processes of social interaction, knowledge and social capital building, which aims to unify scientific, managerial and local knowledge.

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 co-operation (problems of inequality, social exclusion, power differences, and conflicts). It is under conditions of inequalities and unequal opportunities, differentiated ownership, access to and control over resources. Also, relation between experts and the lay citizen is eroded in the public sphere. The inclusion in knowledge to local, lay actors such as consumers, citizens, patients and clients become a central issue for environmental sustainability projects (Tovey et al. 2008).

Environmental knowledge should be produced as an interdisciplinary or transdisciplinary approach that use of a diversity of methods to provoke citizen-environment interactions, and to built natural environment influence on citizen and citizen behavior that will make positive changes in environment. The process of production of knowledge in EEC encompasses transdisciplinary approach – bottom up approach - co-production of knowledge (experts and citizens) – participatory process (allows the network of knowledge holders – from local knowledge to shared knowledge. EEC should unify EE, ESD, SE, CE, so the knowledge may come from the whole of knowledge of this types of educations.

Co-production of knowledge between expert and lay citizen is central to the idea of participatory approach, a form of action research as new form of natural resource governance. It replaces the traditional politics of expertise with recognition that there are multiple ways of knowing, evaluating and acting towards socio-natural systems over time. Sustainable development is strongly shaped by differences in culture, historical experience and economic and environmental conditions. Four pillars approach for social, economic, cultural and ecological (or environmental) sustainability aims for achievement of balanced economic development, social inclusion and environmental protection (Bruckmeier and Tovey, 2008). Interdisciplinary collaboration (approach) 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 a target point of development (Keleman 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 is a platform of interaction between

participants in sustainability planning combining different types of knowledge assuring the above mentioned sustainability (expert, scientific, managerial, tacit or lay) which flows into the same project (Csurg et al. 2008).

Conclusion

The concept of environmental citizenship includes knowledge, awareness, responsibility, consciousness, ability and respectful behavior towards the environment both at the individual level and a societal level. Thus is should be perceived as the 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. Though the past few decades, there is a growing concern regarding the damage that human activities have caused to the environment, nobody gets up in the morning and decides to contribute to: climate change, destruction of the ozone layer, deforestation, etc. on its own. In addition, 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 its 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 book chapter is to emphasize the need for establishing is education for environmental citizenship as a basic knowledge from the very beginning of our educational system by focusing the knowledge gained into two pillars: I) relevant knowledge to environmental citizenship; II) which instrument decides on the knowledge gained through (formal and non-formal) education for environmental citizenship. An education program emphasizing on "environmentology'' should provide a conceptual conscientious approach to life and the planet's resources. It should also emphasize 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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