

The Contribution of Education for Sustainable Development in Promoting Sustainable Water Use

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Abstract Education for sustainable development (ESD) aims at enabling people to make a contribution to sustainable development. Its central educational goal is the development of sustainability key competencies. Water is one of the bases of life on earth and so an important topic for ESD. ESD can help to increase the awareness of water issues and to promote the careful use of water resources. The purpose of this article is to demonstrate the relevance of water as a topic for ESD and to show the approaches and methods that can be used in ESD to raise awareness of the importance of natural resources and develop competencies for the sustainable development of our global society. The International Decade “Water for Life” can be seen as a good context for these educational objectives.

Keywords Education · Sustainability key competencies · Sustainable development · Water

1 Introduction

Sustainable development is connected with comprehensive and far-reaching social transformation and fundamental changes in perspective (e.g., regarding humanity’s relation with nature). These fundamental re-orientations and changes require a correspondingly far-reaching change in awareness on the part of individuals. This can only take place through learning and so this change of mindset should be systematically initiated and defined as a responsibility of the education system.

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Education is an essential part of the sustainability processes; its contribution is explicitly called for in Chap. 36 of Agenda 21: “Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues” (UN Department of Social and Economic Affairs 1992: 36.3). Education for sustainable development (ESD) is not possible without learning processes (cf. Vare and Scott 2007). Education should create awareness for problems related to sustainability, enable the acquisition of knowledge about these problems, and develop the necessary competencies to address them.

The goal of this article is to demonstrate the relevance of water as a topic for ESD and show the approaches and methods that can be used in ESD to raise awareness for the importance of natural resources and develop competencies for the sustainable development of our global society. Before dealing with these aspects, however, we will first explain in general terms the concept of ESD.

2 Education for Sustainable Development

If education is to meet these demands, then sustainable development must be seen in education as a crosscutting issue. This understanding formed the background in the 1990s as the concept of ESD was first put forward (cf. de Haan and Harenberg 1999).

Since then, a wide variety of efforts have been undertaken to integrate elements of ESD in all—formal, non-formal, and informal—educational sectors (cf. Michelsen 2006). At an international level, the United Nations proclaimed the UN Decade of Education for Sustainable Development (2005–2014) in 2005 (UNESCO 2005; cf. Combes 2009). The United Nations Economic Commission for Europe (UNECE) drew up a strategy for the implementation of ESD (UNECE 2005). In Germany, an important federal initiative involved integrating ESD in school education by means of the programs “Program 21” and “Transfer-21” (de Haan 2006, 2010). In the informal sector, there have also been many activities promoting ESD (cf. Rode et al. 2011).

The concept of ESD combines approaches found in educational programs focusing on the environment and development as well as peace, health, and politics. The contents and goals of each of these approaches are related to each other from the perspective of sustainable development. ESD thus attempts to make a contribution to an understanding of complex interrelationships that cannot be dealt with by environmental or development education alone.

The UNECE has articulated its understanding of ESD in its strategy as follows: “ESD develops and strengthens the capacity of individuals, groups, communities, organizations and countries to make judgments and choices in favor of sustainable development. It can promote a shift in people’s mindsets and in so doing enable them to make our world safer, healthier and more prosperous, thereby improving the quality of life. ESD can provide critical reflection and greater awareness and empowerment so that new visions and concepts can be explored and new methods and tools developed” (UNECE 2005: 1). ESD is meant to empower individuals to become involved in sustainable development and critically reflect on their own actions in this

effort. This requires individual competencies that learners should be able to acquire in ESD (cf. Barth et al. 2007; de Haan 2010; Rieckmann 2012; Wiek et al. 2011).

In addition to the development of sustainability-related competencies, Stoltenberg (2009) identifies further goals for ESD: alongside orientative knowledge and action-oriented knowledge, future-oriented knowledge plays just an important role as the critical reflection on values that are part of a vision of sustainable development (especially as related to the preservation of natural resources, human dignity, and justice). Furthermore, this involves gaining the experiences and knowledge that one can participate together with others in shaping one's own life and by taking action today can protect future generations.

3 Sustainability Key Competencies as Educational Goal

The increasing complexity, uncertainty, and dynamics of social change place high demands on the individual (cf. Rychen 2004), whether at the workplace or as an engaged volunteer or in everyday life. These changed conditions make it necessary to be able to take creative, autonomous action. Competencies describe what individuals require in order to take action in a variety of complex situations. They are individual dispositions that include cognitive, emotional, volitive, and motivational elements and are developed on the basis of reflecting on practical experiences (cf. for example, Weinert 2001). In contrast to domain-specific competencies, key competencies are seen as multifunctional and transferable competencies that are especially relevant for attaining important societal goals, are important for all individuals, and require a high degree of reflexivity (cf. Rychen 2003; Weinert 2001). Sustainable development can be seen as a normative framework for the selection of such key competencies.

In recent years, a number of different concepts have been developed which define and identify which key competencies should be acquired as an essential part of ESD (cf. for example, Rieckmann 2012; Wiek et al. 2011). In the German context, ESD centers on the concept of *Gestaltungskompetenz* (cf. de Haan 2006, 2010). "Gestaltungskompetenz means the specific capacity to act and solve problems. Those who possess this competence can help, through active participation, to modify and shape the future of society, and to guide its social, economic, technological and ecological changes along the lines of sustainable development" (de Haan 2010: 320). It includes a number of sub-competencies, which have been repeatedly modified and supplemented. There are now twelve sub-competencies (Fig. 1).

The concept of *Gestaltungskompetenz* is especially characterized by sub-competencies that enable an individual to shape sustainable development in a future-oriented and autonomous way. It emphasizes in particular the fact that sustainable development entails the necessity of fundamental societal changes.

At an international level, OECD in its DeSeCo project ("Definition and Selection of Competencies") has defined key competencies for living in an interdisciplinary and international knowledge society (Rychen and Salganik 2001, 2003). The project aimed at developing a conceptual framework and a theoretical

- To gather knowledge in a spirit of openness to the world, integrating new perspectives
- To think and act in a forward-looking manner
- To acquire knowledge and act in an interdisciplinary manner
- To deal with incomplete and overly complex information
- To co-operate in decision-making processes
- To cope with individual dilemmatic situation of decision-making
- To participate in collective decision-making processes
- To motivate oneself as well as others to become active
- To reflect upon one’s own principles and those of others
- To refer to the idea of equity in decision-making and planning actions
- To plan and act autonomously
- To show empathy for and solidarity with the disadvantaged

Fig. 1 Sub-competencies of Gestaltungskompetenz. *Source:* de Haan (2010: 320)

Table 1 DeSeCo key competencies

Functioning in socially heterogeneous groups	Acting autonomously	Using tools interactively
Ability to relate well to others	Ability to act within the big picture	Use language, symbols, and text interactively
Ability to cooperate with others	Ability to form and conduct a life plan and personal projects	Use knowledge and information interactively
Ability to manage and resolve conflict	Ability to defend and assert one’s rights, interests, responsibilities, limits and needs	Use technology interactively

Source: Rychen (2003: 85ff)

basis for the definition of key competencies which are crucial for the individual and social development of human beings in modern and complex societies. The DeSeCo framework defines three categories of such key competencies (Table 1).

The German discourse on Gestaltungskompetenz can be compared at an international level to the discussion on sustainability literacy (Parkin et al. 2004) and sustainability competencies (Wiek et al. 2011). The key competencies found in different national discourses are comparable; however, there is often a different ranking of their importance, as can be seen in a comparison between key competencies in Europe and Latin America (Rieckmann 2012).

4 The UN Decade of Education for Sustainable Development

Following the recommendation of the World Summit for Sustainable Development in Johannesburg (2002), the General Assembly of the United Nations proclaimed a World Decade of Education for Sustainable Development for the period 2005–2014 to be coordinated by the United Nations Educational, Scientific and Cultural

Organization (UNESCO) (UNESCO 2005; cf. Combes 2009). Its goal is to develop educational measures to contribute to the implementation of the Agenda 21, which was adopted at the 1992 Rio Summit and then reaffirmed at the 2002 Johannesburg Summit, and anchor the principles of sustainable development in national educational systems around the world. All member nations of the United Nations are called on to develop national and international educational activities that will show pathways to preserving and enhancing the living conditions and chances of survival for both existing and future generations.

The German Commission for UNESCO has taken on a coordinating function in Germany similar to the UNESCO role in the United Nations. In order to implement the UN Decade ESD, the Commission has convened a National Committee, chaired by Prof. Dr. Gerhard de Haan (Free University of Berlin) with 35 experts from universities, culture and media, representatives of the German parliament, the German government, and the Conference of Ministers of Education as well as other notable individuals to publicize and promote the idea of sustainability. The work of the Committee is to bundle the numerous existing initiatives, facilitate the transfer of good practice to the broader community, create a closer network of different actors, strengthen public awareness of ESD, and encourage international cooperation (UNESCO 2004a).

At the beginning of the Decade in 2005, the National Committee submitted a National Action Plan, the main goal of which is to anchor the idea of sustainable development in all educational sectors in Germany (UNESCO 2004b). In order to reach this far-reaching goal, the following four strategic objectives are being pursued (ibid.): developing and bundling activities as well as transferring good practice to the broader community, improving public awareness of ESD, and strengthening international cooperation. In 2008 and 2011s, third revised versions of the National Action Plan were published.

Projects and communities receive awards from the German Commission for outstanding engagement in the area of ESD. These awards have helped make the UN Decade of ESD better known throughout Germany, creating a “map” of project locations showing how ESD is being anchored across the country. At the same time, it provides local support for individual actors of ESD. Over 1,900 projects have already received the award Official Project of the UN Decade of ESD, making them members of the Alliance of Sustainability Learning—just as have the 21 Decade Municipalities. Further contributions to promoting the Decade in public have been the ESD Portal (<http://www.bne-portal.de>) and the nationwide Days of Action: ESD (<http://www.bne-aktionstage.de>), which have taken place annually in September since 2008.

5 Water—A Crucial Topic in Education for Sustainable Development

Although the acquisition of competencies is of central importance in ESD, the choice of subject matter for developing these competencies should be carefully made. The topic should be a current one, and it should also be crucial for sustainable, future-oriented development processes, or critical moments in those processes.

De Haan (2002: 16f.) proposes four general criteria for selecting topics for ESD:

1. *Crucial local and/or global topic for sustainable development processes:* The focus should be on the critical debate surrounding the impact, the causes, and possible approaches to solving the global problem. What is important here is that it is possible to create a link between the global problem and an individual's own lived experience. It is also important from an educational point of view that students are able to grasp the reciprocal relationships between local action and global change.
2. *Long-term importance:* As the focus is on the possibilities of shaping the future, ESD should make use of topics that involve persistent challenges. Current topics are also appropriate if they can be shown to have an importance over the long term.
3. *Complexity of knowledge:* Topics should be chosen that already have a complex knowledge base so that it can be emphasized that there is a plurality of approaches to sustainable development.
4. *Potential for action:* It is particularly important that topics have a potential for taking action and so offer specific possibilities for engagement and participation in development processes. The potential for taking action motivates students to take the topic seriously.

Water—as a fundamental condition of life itself—is such a topic. It is of central importance not only at a global level but also at a local level; it has long-term importance, a complex knowledge base, and contains the potential for action—as will be explained below. The problem of water is characterized in general by two aspects: water scarcity and water pollution.

Freshwater is a scarce good in nature. Of all the water on the planet, only 3 % is freshwater, and of that, only 0.3 % is directly available as surface water—most of which, almost 70 %, is contained in the ice cap and in glaciers (Strigel et al. 2010). Human water consumption has risen as a result of increases in population, industry, and agriculture. In particular, with 70 % of worldwide water consumption, agriculture is responsible for the scarcity of freshwater (UNESCO 2012). The availability of water around the world varies greatly. Alongside areas with high precipitation, such as in North America, there are other areas with severe water scarcity, in large parts of Africa and Asia, for example. Approximately 40 % of the world population now lives in the water-poor regions of the world (Simonis 2012). If there is a further increase in population in these parts of the world, then water scarcity will be exacerbated. Since water plays such a crucial role for human life, water scarcity can lead to social discontent and armed conflict (ibid., cf. Menzel 2010).

According to the most recent data of the World Health Organization (WHO) and UNICEF, 884 million people worldwide either have no access or have insufficient access to safe drinking water; and about 2.6 billion people do not have access to toilets or other basic sanitation facilities (WHO and UNICEF 2010).

Alongside scarcity and lack of access to clean water, pollution is a part of the global water problem. The pollution of surface and groundwater causes considerable problems. Although the pollution of bodies of water by industrial and urban wastewater in North America and Western Europe has been reduced considerably, fertilizer and pesticide emissions from agriculture remain a serious problem. “Agrochemicals in particular have had a detrimental impact on water resources throughout the region as nitrogen, phosphorus, and pesticides run into water courses” (UNESCO 2012: 9). Another reason is the contamination of water by pharmaceuticals (e.g., antibiotics) and pathogens from the healthcare system, which also have a feedback effect on the healthcare system (cf. Kümmerer 2009; Schuster et al. 2008; Vollmer 2010).

Contaminated water leads to serious health problems especially in developing countries. Approximately 3.5 million people die every year due to shortages of clean water or from diseases related to contaminated water. Every day, 5,000 children die—roughly 1.8 million every year—from diarrhea and other diseases caused by contaminated water and the lack of sanitation facilities (UNESCO 2012; cf. WHO and UNICEF 2010).

Water is part of many different complex global interrelationships, which are intensified by “global change” (cf. Kaden 2010).¹ For example, the progressive deforestation of the Amazon region is related to global impacts on the hydrological cycle (cf. Simonis 2012). Another example is the interaction between anthropogenic climate change and the local availability of water (cf. Maurer and Moser 2010; Menzel and Matovelle 2010; UNESCO 2012). According to Hoff (2010: 92f), “(...) climate change (will) increase the precipitation variability and further decrease the water supply, particularly in the critical arid regions”. These changes will also have impacts on global food security (ibid.). Future patterns of precipitation are difficult to predict since future population levels are uncertain and global climate models only use very large grid spacing (Maurer and Moser 2010).

In addition, the high water use for the production of food products, industrial, and consumer goods for people in industrial and emerging economies contributes to water scarcity in other parts of the world (cf. August 2010). Hoekstra and Mekonnen (2012) showed that one-fifth of global water use in the period 1996–2005 was due not to household consumption but to exports.

In this context, the concepts of “virtual water” and “water footprint” (WF) are significant. “Virtual water is the amount of water needed for the production of food, industrial, and consumption goods” (August 2010: 88). The water footprint “is an indicator that accounts for both the direct and indirect water use of a consumer or producer and shows how much water and where water is used when a product or service is consumed” (ibid.: 88f.). Water footprint data show that water consumption is unequally distributed across countries. “The WF of the global

¹ To investigate the consequences of global change for the water cycle, the German Federal Ministry for Education and Research commissioned the research program “Global Change in the Water Cycle” (<http://www.glowa.org>).

average consumer was 1,385 m³/y. The average consumer in the United States has a WF of 2,842 m³/y, whereas the average citizens in China and India have WFs of 1,071 and 1,089 m³/y, respectively” (Hoekstra and Mekonnen 2012: 3232).

Against this background, the central challenges for sustainable development in the water sector are (Simonis 2012):

- Ensuring safe water and sanitary conditions for everyone
- Safeguarding a sufficient water supply for agriculture and industry
- Promoting effective water management with measures for water conservation and water resource protection
- Improving international cooperation and providing sufficient means for a preventative global water strategy

The relevance of water as a topic of ESD was underlined when the United Nations proclaimed in December 2003 the International Decade for Action “Water for Life” (2005–2015). The goal of the Decade is to promote awareness of water issues among decision makers and the general public around the world and to encourage implementation of commitments that have already been made. In this context, the seventh Millennium Development Goal is of extremely importance, i.e., to “halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation” as well as to end non-sustainable forms of water use. This goal was already reached in 2010. “Between 1990 and 2010, over two billion people gained access to improved drinking water sources, such as piped supplies and protected wells” (United Nations 2012: 4). On July 28, 2010, through Resolution 64/292, the General Assembly of the United Nations adopted the right to water in the Universal Declaration of Human Rights.²

6 Learning Sustainability with a Focus on Water

ESD contributes to raising awareness about water issues and promotes a preventative approach to water resources (cf. UNESCO 2009). As discussed above, aspects of water that can be addressed in ESD include, for instance, water as a basis of life, water scarcity, water pollution, equitable access to water, water distribution, water as a resource for agriculture and industry, and complex global interrelationships such as climate change, water exports (virtual water, water footprint), and water resource management.

Engaging in serious discussions on these topics not only enables students to learn about water and sustainable development but also to develop

² Introduced by Bolivia, the resolution received 122 votes in favor and zero votes against, while 41 countries abstained from voting, one of them the United States. The Resolution calls upon States and international organizations to provide financial resources, help capacity-building and technology transfer to help countries, in particular developing countries, to provide safe, clean, accessible and affordable drinking water and sanitation for all.

sustainability-related key competencies. If, for example, the complex interrelationships discussed in the section above become part of the focus of ESD, then students will be able to improve their competency for systems thinking. Discussions about the possible consequences of climate change for precipitation variability can also contribute to developing their competency for thinking and acting in a forward-looking manner and competency in dealing with incomplete and overly complex information. If, for example, the ecological, economic, and health aspects of water and their interrelationships are discussed, then this can contribute to interdisciplinary learning. When learners are confronted with the fact that 92 % of the global water footprint is due to the consumption of agricultural products—22 % of which involves the production of meat (Hoekstra and Mekonnen 2012)—then there is an obvious connection to be made to their own consumption habits, in particular to their nutritional behavior. And there are also possibilities to develop the competency in referring to the idea of equity in decision-making and planning actions. Table 2 shows an overview of examples of possible relationships between important issues concerning water and ESD.

As competencies cannot be taught but only developed by means of practical experiences and subsequent reflection upon them, it is essential to provide space for learners to be able to make their own experiences, try things out, organize things on their own, and face up to challenges. In this context, particularly appropriate educational approaches include independent study, project-oriented learning (in real-life situations), multi-perspective and interdisciplinary thinking and working, as well as developing the capabilities for participation, dialog, and self-reflection (cf. Stoltenberg 2009).

The following three projects received awards in the UN Decade program (cf. <http://www.dekade.org/datenbank>) and are specific examples illustrating how water can be dealt with as a topic in ESD.

*Project “Virtual Water—Hidden in your Shopping Basket”*³: In spring 2008, the “ideas competition” sponsored by the German Association of Water Protection invited young people above the age of 10 years old to discover and then reveal to others the amount of water hidden in our food and products we use every day. They were also able to do research on the relationship of our lifestyle with water scarcity in other countries and show how a more environmentally aware way of living could contribute to a more responsible use of water. Questions such as “How much water is in the products we use and consume every day, and where do they come from?” or “How much water do we really use if we include virtual water?” are among those discussed in the project. The project thus contributes to raising awareness about such aspects as high levels of water use and water export. Moreover, young people are encouraged to reflect on their own behavior. Some of the competencies that can be developed include competencies in acquiring knowledge and acting in an interdisciplinary manner, in dealing with incomplete and

³ <http://virtuelles-wasser.de> (18.02.2014).

Table 2 Water issues and education for sustainable development

Water issues	ESD relevance	ESD key competencies
Water as a basis for life (e.g., water as a resource for agriculture and industry)	Retinity principle ^a	Competency in acquiring knowledge and acting in an interdisciplinary manner
Water scarcity/water pollution/water resource management	Managing natural resources, intergenerational justice, orientation toward the future	Competency in thinking and acting in a forward-looking manner Competency in referring to the idea of equity in decision-making and planning actions
Access to safe water/water distribution/conflicts over water use	Intergenerational justice	Competency in showing empathy for and solidarity with disadvantaged people
Cultural understanding of water and its use	Cultural perspectives	Competency in showing empathy for and solidarity with disadvantaged people Competency in reflecting upon one's own principles and those of others
Complex global interrelationships, e.g., related to climate change	Global networks, global change, complexity	Competency in acquiring knowledge and acting in an interdisciplinary manner Competency in dealing with incomplete and overly complex information
Climate change and precipitation variability	Uncertainty, orientation toward the future, intergenerational justice	Competency in thinking and acting in a forward-looking manner Competency in dealing with incomplete and overly complex information
Water export (virtual water, water footprint)	Consumption behavior, global networks, complexity, intergenerational justice, managing natural resources	Competency in referring to the idea of equity in decision-making and planning actions Competency in acquiring knowledge and acting in an interdisciplinary manner Competency in showing empathy for and solidarity with disadvantaged people Competency in dealing with incomplete and overly complex information
Interrelationship between, for example, ecological, economic, and health aspects of water	Complexity	Competency in acquiring knowledge and acting in an interdisciplinary manner

^aIn its 1994 Report on the Environment, the German Advisory Council on the Environment emphasized the importance of the key principle of "retinity", that is the holistic linking of all human activities and products with their basis in nature (SRU 1994)

overly complex information, in referring to the idea of equity in decision-making and planning actions, and in showing empathy for and solidarity with disadvantaged people.

*Project “Water School”*⁴: The goal of the water foundation is to empower people in water-poor regions to secure their own supplies of water. The focus of this mission is the “Water School” project, the first of which was in Eritrea. In a relatively small area around a school, experts, partners, and local people develop a concept for regional water use and supply. School students are the most important disseminators in this concept. Partnerships between project schools in Germany and in developing countries, but also within developing countries, serve to further the exchange of experiences. Some of the competencies that can be developed include competencies in cooperation, in participation, in gathering knowledge in a spirit of openness to the world and integrating new perspectives, and in planning and acting autonomously.

*Project “Bread and Fish: Caring for the Baltic”*⁵: This project of the Ecumenical Foundation for the Conservation of Creation and Sustainability focuses on environmental ethics and communication in the whole Baltic Sea region. The terms “bread” and “fish” stand for agriculture and fishing. The central instrument of the project is the “Bread + Fish Days”, an innovative event that serves to further intercultural exchange and strengthen the relationships among the different regions around the Baltic Sea and the relevant social and political institutions in each country. The goal of the project is thus the creation of a common ethos toward sustainability in the countries of the Baltic Sea region, a deeper understanding of ecological and economic conflicts afflicting the agriculture and fishing industries, as well as providing stimulus for exemplary projects and types of networking. Some of the competencies that can be developed include competencies in gathering knowledge in a spirit of openness to the world, integrating new perspectives, in cooperation, and in reflecting upon one’s own principles and those of others.

In order to emphasize the particular importance of water for ESD, the National Committee set up by the German UNESCO Commission for the Decade ESD selected water to be the issue highlighted in 2008. As a contribution to this year’s topic, the Commission organized, as part of the nationwide Days of Action of the UN Decade of ESD, a conference on water in ESD in Hanover on September 22, 2008.

And finally, there is a variety of educational and teaching material for deepening the understanding of water as part of ESD. As part of a free service provided to teachers, the Federal Ministry of the Environment provides materials for lessons about “Water in the twenty first Century”. The topics “A river is more than water” and “Lifestyle and water” show school students the importance of acting in a preventive and responsible manner with water as a crucial resource in the context of scientific, geographic, and social problems. In addition, six of the workshop

⁴ <http://www.wasserstiftung.de> (18.02.2014).

⁵ <http://www.bread-and-fish.de> (18.02.2014).

materials that are part of the federal-state “Program 21” are related to the topic of water: renaturalization of streams and rivers, city park ponds, water, swimming ponds, water project week, and stream sponsorships.

The material “Resources—Use and Waste”⁶ introduces school students to the problem of using resources with a number of different sets of issues. There are a number of worksheets on the topic available in the section “Water Belongs to Everybody”. In the educational offering “Lifestyle and the global water crisis”,⁷ the focus is on such topics as virtual water consumption, lifestyle, and consumption behavior—in a 4-h lesson unit that is meant to encourage school students not only to discuss the issue but also to act.

7 Conclusion

ESD aims at empowering people to make a contribution to sustainable development. The central educational objective is to develop sustainability key competencies, such as the competency for thinking and acting in a forward-looking manner and the competency for acquiring knowledge and act in an interdisciplinary manner or participation competency. Within the framework of the UN Decade of ESD (2005–2014), measures have been taken in all areas of the education system to promote sustainable development. In Germany, more than 1,900 projects have been already recognized as official projects of the UN Decade of ESD and are thus members of the Alliance Learning Sustainability.

Water is a fundamental condition for life on earth. Water scarcity and pollution are key challenges of sustainable development. The importance of water and the complex global interrelationships make it an ideal topic for ESD. ESD can help increase awareness of water issues and promote the careful use of water resources. Aspects of the water topic which can be addressed in ESD include, for instance, water as a basis for human life, water scarcity, water pollution, (equitable) access to water, complex global interrelationships with climate change, and water export (virtual water, water footprint). By dealing with these topics, the development of key competencies relevant to sustainability can be promoted, such as the competencies for interdisciplinary knowledge acquisition, in thinking and acting in a forward-looking manner, dealing with incomplete and complex information or referring to the idea of equity in decision-making and planning actions. As many projects, e.g., the Project “Bread and Fish: Caring for the Baltic”, and materials indicate the topic of water is suitable to raising awareness of the importance of natural resources and to developing competencies for the sustainable development of our (global) society. The International Decade Water for Life can be seen as a good context for these educational objectives.

⁶ http://www.institutfutur.de/transfer-21/daten/materialien/tamaki/t2_ressourcen.pdf.

⁷ http://www.transfer-21.de/daten/themen/28_E.1.1_Virtuelles%20Wasser_sp.doc.

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