

# Part 2

**Key Concepts and Methods of Education  
for Sustainable Development in Biosphere Reserves  
and other Designated Areas**

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# Chapter 5 Key concepts in Education for Sustainable Development (ESD)





## Chapter 5

# Key concepts in Education for Sustainable Development (ESD)

### 5.1 From Environmental Education (EE) to Education for Sustainable Development (ESD)

Initial ecological awareness and concern began in the 1960's. The magnitude and severity of ecological problems became a growing concern for both scientists and the public as the quality of life and health of the planet became increasingly threatened in various ways (e.g. with higher rates of species extinctions and significant increases in human pollution). In this environmental crisis, the notion of educating citizens, particularly the young ones on environmental issues became essential. The 1968 UNESCO Biosphere Conference in Paris was the first scientific intergovernmental gathering on the environment, with recommendations including recognition of "the special importance and need for sound environmental education" at the primary and secondary school levels. It was also an important step leading to the creation of the MAB programme (Final report. 1<sup>st</sup> Intergovernmental conference of experts on the scientific basis for rational use and conservation of the resources of the biosphere, Paris, 4-13 September 1968). On the other hand education at that time underwent its own crisis. In response to both, a new type of education was born, known as **Environmental Education (EE)**.

EE was promoted considerably in the early 1970s, especially during the Intergovernmental Conference of United Nations on the Human Environment (Stockholm, 1972). The **Stockholm Conference** is considered a milestone event for EE, as it led to efforts of the international community to form the **United Nation Environment Programme (UNEP)** and inspired the creation also of many Non Governmental Organizations (NGOs) for the protection of the environment.

1. *Cité des Sciences et de l'Industrie*,  
Science museum, popularization of sciences, Paris, France  
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In the Stockholm conference a proposal was made for the official recognition of the promotion of EE in all countries. For this purpose, UNESCO (the United Nations Education, Scientific and Cultural Organization) and UNEP established the **International Environmental Education Program (IIEP)** which organized the International Workshop of Experts in Belgrade (1975). Delegates of the Workshop formulated the concepts, visions and the characteristics of EE in the so called **Belgrade Charter**. These principles were adopted by countries in the Tbilisi Conference (1977). This was the first intergovernmental conference convened especially for the EE and resulted in the **Tbilisi Declaration**, a reference text for all the studies which followed until today.

According to the Tbilisi Declaration "a basic aim of EE is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic, and cultural aspects, and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving environmental problems, and in the management of the quality of the environment."

The categories of EE objectives for social groups and individuals are:

**Awareness** – to help them acquire an awareness and sensitivity to the total environment and its associated problems.

**Knowledge** – to help them gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.

**Attitudes** – to help them acquire a set of values and feelings of concern for the environment and the motivation for actively participating in environmental improvement and protection.

**Skills** – to help them acquire the skills for identifying and solving environmental problems.

**Participation** – to provide them with an opportunity to be actively involved at all levels in working toward resolution of environmental problems.

In this framework three fundamental dimensions of EE were identified and developed (UNESCO, 1980):

- **Education about the environment:** is focused on cognitive aspects, concerned with the acquisition of knowledge and understanding of the environmental issues.

- **Education in the environment:** refers to the outdoor scenery or environmental setting, both natural and anthropogenic, as the means in which the development of knowledge, skills and feelings is taking place through the experiences. This dimension of EE stimulates interest, recreation and sensitisation.





2. Deciding on priorities,  
UNESCO World Conference on ESD, Bonn, Germany  
© German Commission for UNESCO/Kornelia Danetski



3. Workshop synthesis,  
UNESCO World Conference on ESD, Bonn, Germany  
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• **Education for the environment:** refers to the personal motivation and the sense of responsibility which results from the development of a personal environmental ethic. EE must embrace responsibility in decisions and actions as it is, by nature, committed and action-oriented. It promotes its objectives and principles, not by indoctrination, but through cultivating knowledge, critical thinking and decision-making skills in order to stimulate the adoption of conscientiously responsible attitudes and behaviours.

**Some of the main characteristics attributed to EE already since the Tbilisi Conference were the following:**

- EE should be Problem-Solving
- EE should be Inter-disciplinary
- EE should be a Lifelong process
- EE should integrate education in society
- EE should examine issues from local, national, and international points of view
- EE should examine the issues from a historical point of view
- EE should connect the local to the global scale
- EE should utilize diverse learning environments & a broad array of teaching approaches

The vision and objectives of the **Tbilisi Conference** embodied the spectrum of EE objectives: environmental, social, and ethical, economic and cultural. All these facets are essential to the understanding and consolidation the current notion of “Education for Sustainable Development” (ESD). The principles of Tbilisi were translated into educational policies in many countries around the world, they helped set EE curricula and set the pace of action on the national and international level. Its subsequent application at the level of formal schooling system, however, proved quite difficult (Scoullos & Malotidi, 2004).

Ten years after the Tbilisi Conference, environmental degradation continued, despite mounting concerns and efforts to protect the environment in various countries. Pollution levels increased substantially, environmental risk multiplied, the problem of poverty accelerated and the gap between developed and underdeveloped countries became wider. These challenges were expressed during the 1987 Moscow Conference “International Strategy for Action in the Field of Environmental Education and Training for the 1990s” (UNESCO/UNEP) which reaffirmed the goals and principles of EE as declared in Tbilisi and was also a crucial conference in terms of developing a strategy.

4. Cité des Sciences et de l'Industrie, Children's city, popularization of sciences, Paris  
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At that time, a new concept started to develop calling for a new type of “development”, with new goals and a re-oriented vision (UNESCO-UNEP, 1987). During the mid-1980s, the concept of **Sustainable Development** (SD) became increasingly a common usage. In the milestone “Our Common Future,” or “Brundtland” Report (1987), the often-quoted definition of sustainable development is: “development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs”.

To promote and be consistent with the principles of SD, education movements started to develop the concept of **Education for Sustainable Development** (ESD), which obviously stemmed from the roots of EE. ESD gradually gained ground basically due to the efforts of various groups, including ministries, intergovernmental bodies and NGOs. Additionally, throughout the 1980s and 1990s various targeted types of educations were developed, such as development education, peace education, human rights education, health education, and multicultural education.

During the International UN Conference on Environment and Development in Rio (1992), the need to re-orient education worldwide in order to be consistent with the challenges and the demands of sustainable development was recognised as a priority. In this respect, **Agenda 21** (for the 21<sup>st</sup> century) of the Rio Summit called for re-orientation of EE towards sustainability. In Chapter 36, it states: “Education, including information and sensitisation of citizens and training, must be recognized as a process through which individuals and society can put to good use fully their potential. Formal and non formal education is vital for the adoption of attitudes responsible for the assessment and facing issues related to sustainable development”. Agenda 21 highlights, among others, the significance of involving students and schools in activities in national parks, areas of natural/ecological interest, etc.

In 1997, five years after the Earth Summit, the international Conference on “Environment and Society: Education and Public Awareness for Sustainability” took place in **Thessaloniki**, aiming to highlight the significance and the role of education in the accomplishment of sustainability. This Conference adopted the relevant term “Education for Environment & Sustainability” (EfES) that incorporated issues of environmental degradation, poverty, food supplies, safety, human rights and peace (Scoullou, 1998).

After the Conference in Thessaloniki, it became clear that SD needs more than simply including cotemporary societal, ecological and cultural parameters. Rather, SD involves a new mindset, in which these parameters are not in conflict (as they are commonly portrayed within false dilemmas). Instead, these processes function, as much as possible, as a unified whole of powers of synergy. Having this in mind, education can develop new links among educational and developmental policies. In this respect, the ESD strategies must not isolate the interest in the environment from the concern for development; neither put the decisions for economic development or environmental protection exclusively in the sphere of science, separating them from the related ethical issues and values. In fact, ESD must bring together the essential but scattered pieces of the “puzzle of life”, so that development is not considered only an economic issue or a permanent threat to the environment, but the total of rational and ethical choices which support the vision of sustainable future.

The conclusions of the **Johannesburg Summit** of 2002 make repeated references to ESD, and recognizing education as an important parameter of sustainability they emphasize the need for inclusion of sustainable development in all educational systems at all levels.

5. Educational panel in EE center, *La Pedriza*, *Cuenta Alta del Río Manzanares BR*, Spain  
© UNESCO/Olivier Brestin



6. Young ESD Voices Workshop, *UNESCO World Conference on ESD*, Bonn, Germany  
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## Relationship between ESD and EE

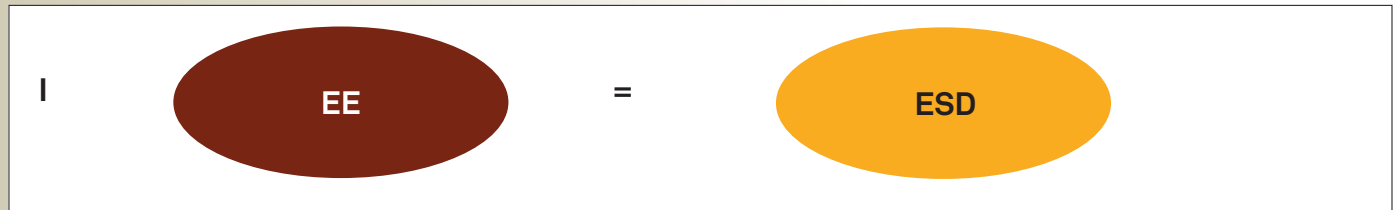
Extract from *Review of Contexts and Structures for ESD 2009*, DESD M&E process

[...] It appears that in countries with a strong EE tradition, ESD tends to build upon EE structures and policies already in place, particularly in countries that have interpreted EE broadly to include social, economic and political dimensions. [...]

In countries where such a tradition is absent or weak at best, ESD and the DESD appear to have provided an opportunity to create new structures from scratch and a possibility to catch up with those countries that already had a strong EE tradition. When analyzing the regional synthesis reports and the regional strategies, one can find three different ways of viewing the relationship between EE and ESD which

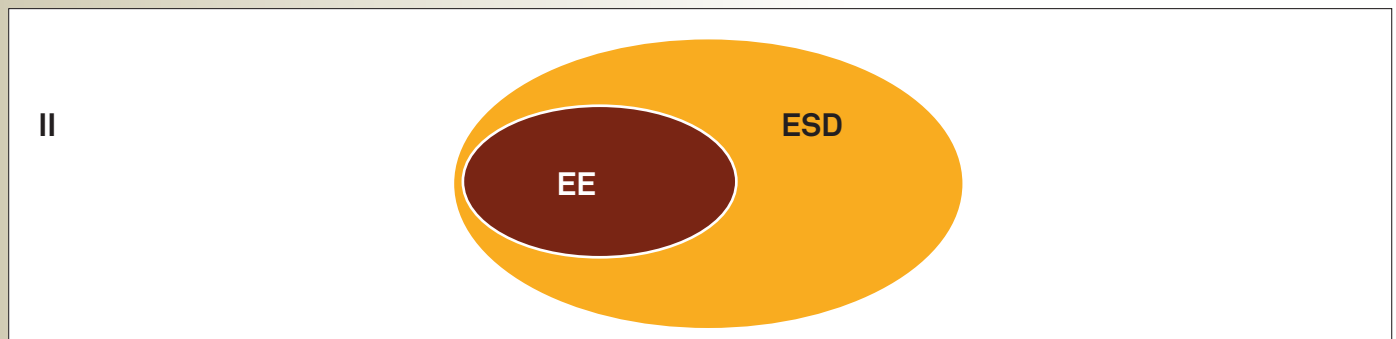
resemble some of the ones identified in the ESDebate held in 1999 (Hesselink, F.). The way the relationship is perceived tends to be related to the historic role EE has played in a country (prominent or marginal) and the way EE itself is interpreted (broad or narrow).

In other countries with a strong EE tradition, it may be interpreted more broadly, in tune with the Tbilisi Declaration, to include socio-economic and political aspects (The Unesco-UNEP 1977 Tbilisi Declaration [www.unesco.org](http://www.unesco.org)). When interpreted as such, EE and ESD become almost synonymous. These three relationships are described below:



Environmental education has been firmly established over time and in the spirit of the forward-looking Tbilisi Declaration. It is viewed broadly to include issues of poverty, inequity, values and ethics. The emergence of ESD is not necessarily seen as an opportunity for renewal or reform but rather as a distraction of the good work that is already being done in the name of EE. In the worst cases, ESD might actually have a negative effect on the good work done under EE as this field is no longer seen as up-to-date or relevant by policy-makers and donors since it does not reflect ESD supported by, for instance, the DESD and the international community. Two responses within this view of the relationship between EE

and ESD can be seen. In some countries, EE continues to evolve and remains popular because people can identify better with it than with ESD (e.g. USA). In other countries, where the government has joined the international group of nations that committed themselves to ESD, groups are strategically or pragmatically adopting ESD, without necessarily changing their EE practice in order to remain eligible for funding and government support. In the latter case, one can sometimes see the emergence of EE for sustainable development (e.g. Taiwan) or EE for sustainable societies (e.g. Brazil).



Whereas, in some of its forms, EE narrowly focusses on environmental protection, natural resource management and the conservation of nature, ESD constantly goes further by bringing in socio-economic, political and cultural dimensions. In a sense, EE had become outdated and needed to be upgraded and replaced by ESD to better focus not only on the Planet but also on the People and Prosperity aspects of environmental and sustainability issues. In some parts of the world, the emergence of ESD has provided a stimulus for EE reform in this way and in countries where there was no tradition in EE or where it was marginally present, the DESD movement provided an opportunity for a jumpstart (e.g. Vietnam, many Arab countries). ESD and EE are distinct, although they do overlap and

both are legitimate and necessary. The old EE infrastructure and existing programmes therefore, will need to be still supported and government support for ESD should not be at the expense of EE. At the same time, the development of ESD needs to be supported as well as it adds important new dimensions that EE does not address or only addresses lightly (e.g. the socio-economic and cultural dimensions.) As a result, parallel policy streams and support mechanisms exist: one focussing on EE and another on ESD (e.g. The Netherlands, Canada, Greece). Sometimes coordination mechanisms are in place to assure that the EE stream is also informed by the ESD stream and vice versa.

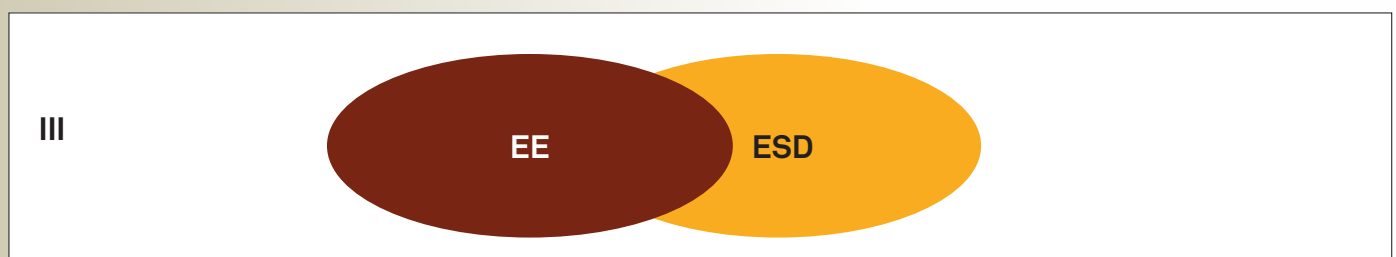
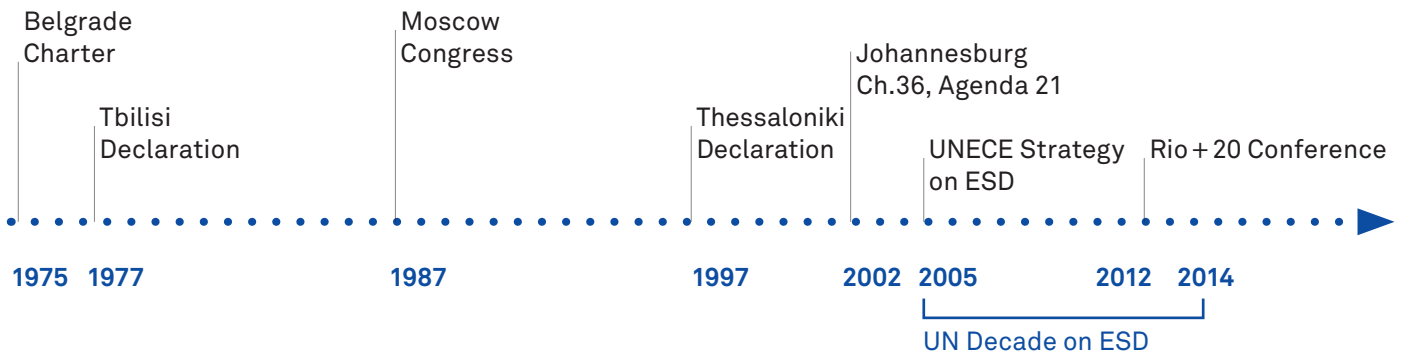




Figure 18  
The timeline of EE towards ESD

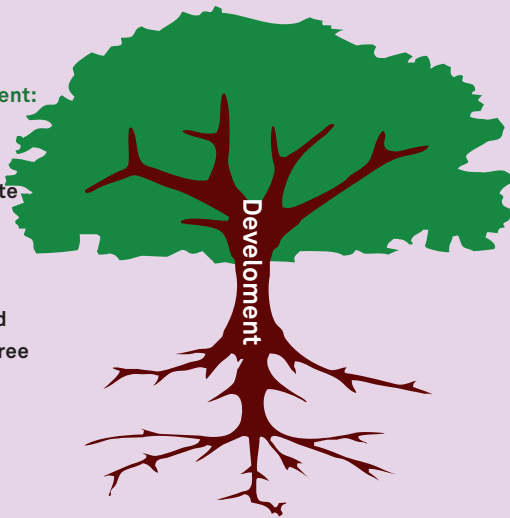


**Schematic representation of the different approaches that EE and ESD apply regarding Designated Areas:**

Within typical EE, environmental protection is a prerequisite for development; development is expected when the environment and natural resources are properly managed. On the other hand, ESD considers that the environmental protection, though essential, is not enough; the whole system needs to be protected, given that the environment is component of development (even though this cannot be the case in a “strictly protected” area). Therefore, every region should be managed in a sustainable way, based on a specific set of criteria. In other words the protection of the environment is absolutely necessary but not the only prerequisite for the achievement of sustainable development (Scoullos, 2008).

**The typical approach of EE towards Designated Areas**

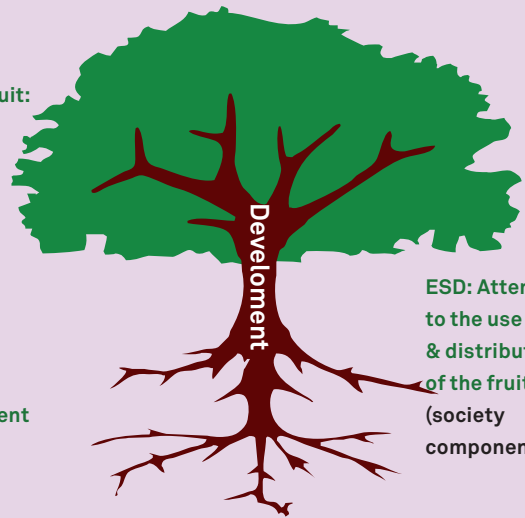
**EE: Attention to the Environment:** Appropriate environment is the prerequisite to maintain the tree, and if it is giving fruits that's good for all, and the tree will keep giving fruits, etc.



**EE: Caring for the Environment in order to maintain the tree**

**The ESD approach for Designated Areas**

**ESD: Attention is given to the fruit:** pruning, etc. (economy component)



**ESD: Attention to the use & distribution of the fruit (society component)**

**ESD: Attention to the Environment**

**ESD: Caring for the tree in order to have the tree and sustainable production of fruits; attention to the Environment, Society and Economy**





### From EE to ESD: the case of France

Following the experimental phase in 84 schools over one-year period a system of environmental education for sustainable development was introduced in all schools in France. This system is now part of the National Educational Policy (and also put under the National Strategy for SD) and it was developed on the basis of close cooperation between schools, local authorities, social groups and the private sector so as to enable future citizens to develop appropriate behavior at all aspects of their lives. The system is continuously evaluated involving local authorities and the civil society. The whole process includes four main pillars: (a) modification of school curricula to introduce SD; (b) teacher training and the development of appropriate tools and methodologies; (c) setting up of committees in each region to monitor the introduction of the system; (d) creation of regional partnerships. The result was the gradual transition from EE to ESD through a transdisciplinary approach (UNESCO, 2007).

In the course of the thirty years development of EE (1975-2005), different ways of implementation and pedagogy were applied. The aim was to have fruitful outcomes according to the original goals set by the visionaries of EE. In this respect, the EE as a rule achieved to link environmental problems with the wider socio-economic framework of issues and concerns. EE, as it was set in a borderline context from the various international conferences of the 1970s, already contained the idea of sustainability and many of the goals and principles of ESD, such as the social dimensions of the environmental issues, the links to the economy, and the global view of the present situation. Despite all these developments, ESD in its present form broadens and “rectifies” to a certain degree the previous approaches.

Both the issues of biodiversity and Biosphere Reserves in relation to ESD were discussed during the 2007 Ahmedabad Fourth International Conference on Environmental Education towards a Sustainable Future. The Ahmedabad Declaration also stated that EE processes support and champion ESD; it calls for support to EE and for developing sound ESD policy frameworks.

The UNESCO World Conference on Education for Sustainable Development that was held in Bonn, Germany, in 2009 marked the mid point of the Decade of ESD. There were 22 workshops organized with one focused on Mainstreaming Biodiversity into Education during which participants were reminded that biodiversity (especially ecosystems) illustrates global interdependences, the consideration of which is vital to ESD. They underlined the use of already existing internationally connected networks of knowledge, practice and research and the importance of promoting the biodiversity-ESD nexus in a comprehensive concept. In order to develop strategies for the way ahead, they proposed to mainstream the opportunities offered by ESD into the work programmes of different international organs, Government departments, private sector, NGOs, taking advantage of events and processes such as the International Year of Biodiversity (2010), the Conferences of the Parties (CoPs) of those Multilateral Environmental Agreements dealing with biodiversity or the United Nations Decade on Biodiversity (2011-2020).

7. Almonds on almond tree (non-irrigated crops), Valles del Jubera, Leza, Cicados y Alhama BR, Spain  
© UNESCO/ O. Brestin

8. Orjan olive oil soap, Nature shop, RSCN, Jordan  
© RSCN

9. The Kozjansko apple festival, Kozjansko & Obsotelje BR, Slovenia  
© Archives Kozjansko Park

Another workshop of the Bonn Conference that focused on BRs as learning Sites for Integrating Local and Global Sustainability Issues, stressed that UNESCO Biosphere Reserves have a high value in the ESD process, locally and globally, as spaces for mutual learning among communities, researchers, managers, decision-makers and other stakeholders. The lessons they provide in participatory approaches to combining scientific, local and traditional knowledge to pursue sustainable development choices need to be made widely available during 2010-2014.

Lucie Sauv , Research Chair of Canada in Environmental Education at Universit  du Qu bec   Montr al, identifies a number of dimensions of human relationships with the environment that link to different ways of apprehending the environment.

Seven interpretations are proposed:

- Environment as nature (to be appreciated, respected and preserved).
- Environment as a resource (to be managed, to be shared).
- Environment as a problem (to be avoided, to be solved).
- Environment as a system (to understand so as to improve decision-making).
- Environment as a place to live (to get to know, to improve).
- Environment as the biosphere (in which to live together over the long term).
- Environment as a community project (in which to become actively involved).

“The relationship to the environment depends greatly on the context and is culturally determined. It is therefore expressed through a set of interlinked and complementary dimensions. An EE that is limited to only one of these dimensions is incomplete and nourishes a biased vision of what is “being-in-the-world” (Sauv , 2002).

## 5.2. Basic principles and characteristics of ESD

ESD is a lifelong process which involves all types of education touching upon the critical themes that the global community faces, such as poverty, human rights, citizenship, peace, democracy, social and economic development, health, gender equality, and cultural diversity, protection of the environment and the natural resources, sustainable patterns of consumption and production. It promotes understanding of these issues highlighting their interdependence with the natural and socio-economic systems, both at local and global levels. In this attempt,

ESD stimulates critical reflection and decision making that should be reflected in people lifestyles, and also, encourages active participation of the citizens in building their future and “making the difference”.

In order to achieve the above mentioned tasks, ESD applies learning methods which are:

- Interdisciplinary and holistic
- Learner-centred and participatory
- Values-driven, promoting critical thinking & exploring all interested “sides”
- Forward-looking, promoting medium and long-term planning
- Locally-relevant, encouraging multilateral collaborations among schools, local actors and authorities, scientific communities, the private sector and NGOs, etc., and,
- Revealing global issues and connections as part of everyday life, whether in a small village or a large city.

10



Today more than ever before, global interdependence is part of everyday life. How people share and use the earth's resources affects the health of the planet as well as of everyone with whom we share it – now and in the future. We live in an interconnected world in which decisions taken in one place can affect people living on the other side of the planet. Even the wealthiest countries depend heavily on other countries riches – from physical commodities such as foodstuff and minerals to culture and knowledge.

11



**10.** Reading the panels in EE center, *La Pedriza, Cuenta Alta del Río Manzanares BR, Spain*  
© UNESCO / O. Brestin

**11.** Film screening at the EE center, *La Pedriza, Cuenta Alta del Río Manzanares BR, Spain*  
© UNESCO / O. Brestin

**12.** Folklore in the *Djerdap National Park, Serbia*  
© Philippe Pypaert

### ESD in Urdaibai Biosphere Reserve (Basque Autonomous Country, Spain)

The municipality of Gernika has one of the five Ingurugela-CEIDAs: Capacity and Training Centres for teachers and schools under the Basque Government coordination. It coordinates the ESD programmes and activities of the 13 schools which are now working in the School Agenda 21 Programme of Urdaibai, with almost 5432 children in the Reserve. Related educational materials are developed and applied, followed by a close monitoring of the educational activities and results. One of the goals of the School Agenda 21 in Urdaibai is the close coordination between the ESD Programmes (School Agenda 21) and the local environment programmes (Local Agenda 21). Other stakeholders and social actors take active part in the developing of education materials and the implantation of activities. Among them UNESCO Etxea: UNESCO Centre in the Basque Country, which has developed several materials related to the better knowledge of the Urdaibai Landscape. Additionally, UNESCO Etxea has organized the Annual Urdaibai Conference for Sustainability since 1994, with a wide range of themes related with energy, education or cultural heritage. Many other actors take part in dynamizing environmental education for children; Sukarrieta Centre for Experimental Education is one of the most active institution. Funded by a local bank and the Basque Government, it holds regularly camps of groups of primary students from all over the Basque Country. These students participate in an outstanding learning experience in the heart of the Biosphere Reserve. Many environmental programmes, publications and toolkits have been developed.

Higher education: UNESCO Chair on “Sustainable Development and Environmental Education” of the University of the Basque Country collaborates with Urdaibai Biosphere Reserve by promoting research projects and studies on the area with the aim of learning more about it and to be able to set up measures of protection and development. Numerous research groups from a variety of disciplines are currently conducting work in and about Urdaibai, using the Biosphere Reserve as a reference area for research ([www.ehu.es/cdsea](http://www.ehu.es/cdsea)), this information resource is being used to edit a scientific-didactical guide of Urdaibai Biosphere Reserve.



“Before you eat breakfast this morning, you’ve depended on more than half the world. This is the way our universe is structured. We are not going to have peace on earth until we recognize this basic fact of the interrelated structure of all reality.”

Dr Martin Luther King Jr



12

Reviewing the educational objectives from Tbilisi onwards, the following categories of aims can be reported for ESD:

- **Information, knowledge and awareness:** To help learners become deeply aware of complex contemporary issues such as environmental degradation, poverty, gender inequality, human rights violations, non-sustainable production, overconsumption, etc.
- **Behaviour, attitudes and values:** To help learners gain experiences, adopt values for the environment and society by understanding their interdependence, as well as secure necessary incentives for their active participation in environmental protection and in improving the quality of the environment and of life, especially for the underprivileged such as the poor, women, cultural and ethnic minorities, refugees, etc.
- **Skills/Competences:** To help learners acquire the skills necessary to identify and address contemporary issues by taking action, decision-making, using communication skills, critical thinking and investigation, problem-solving, conflict management, cooperation and social behaviour, etc.
- **Participation:** To provide learners with opportunities for active involvement and to encourage collective action for resolving issues of interest, on a local scale and beyond (“think globally, act locally”).

These objectives are in accordance with those of education in general, as they were set by the **International Commission for Education for the 21<sup>st</sup> Century** (Delors, 1996). The Commission’s work resulted in the following key priorities for education:

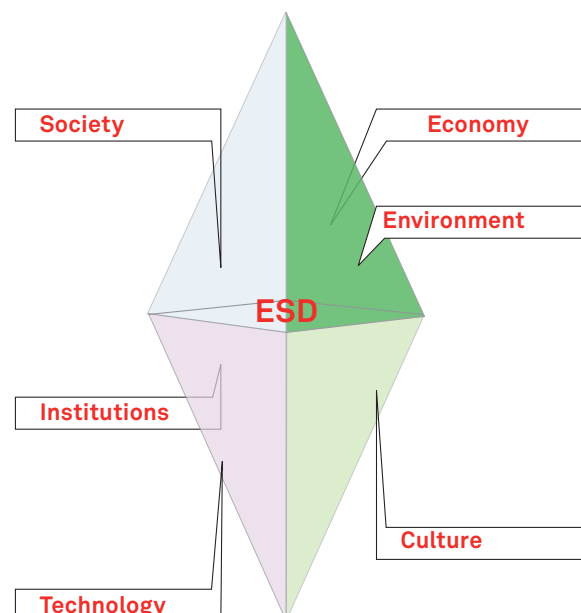
- “Learning to know”: education should develop skills to help learners to be able to recognize, address and resolve challenges of the modern world. This educational framework opens the road for life-long learning and adaptation to ongoing and changing societal, scientific and technological knowledge.
- “Learning to do”: education should develop skills that help learners make decisions and take action on issues that concern the local community and affect the quality of life.
- “Learning to live together”: education should develop the values of tolerance, respect for cultural diversity, democracy, and human rights with the aim of the fruitful and peaceful coexistence of peoples.
- “Learning to be”: education should ultimately cultivate multi-faceted development and reinforce human individuality and integrity.

During the Johannesburg Summit (August 2002) it was proposed to establish a **UN Decade of Education for Sustainable Development** (2005-2014), which was adopted unanimously in the UN General Assembly a few months later (December 2002, Resolution 57/254). The primary goal of this Decade is the promotion of education as a basis for a sustainable society and the diffusion of principles of sustainable development into all forms of education (formal, non formal and informal) and in all educational systems.

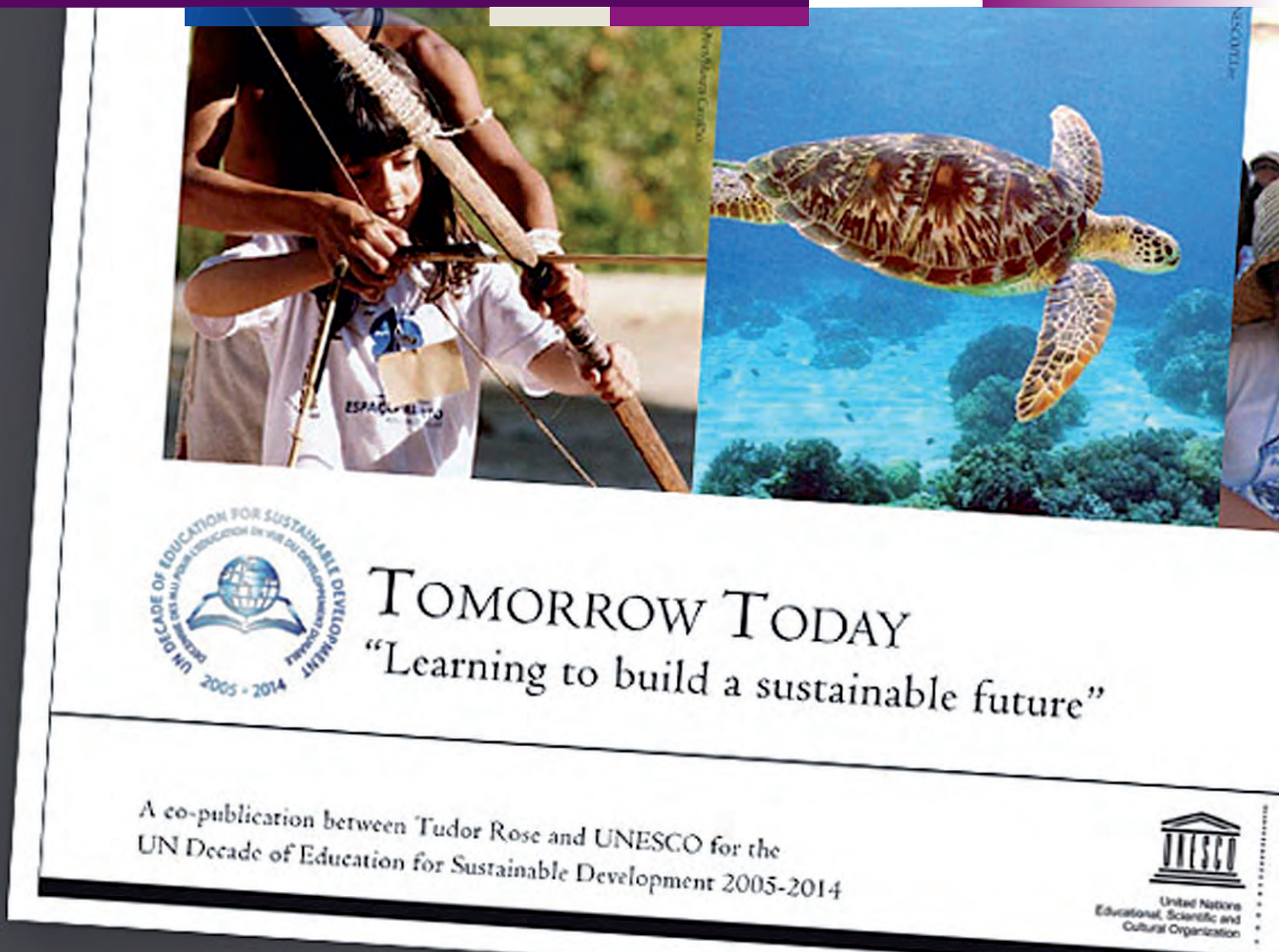
Figure 19

#### The model for ESD as a double pyramid (Scoullos, 2004)

The dimensions of ESD can be presented as a double pyramid (diamond). The sides of the upper part of the pyramid represent the components of SD, that is society, economy and the environment, whereas the sides down below represent the preconditions for the application of SD in areas which need “changes” for its accomplishment, that is institutional rules, technology and culture. The presentation shows clearly the interdependence and the interactions of the basic components of SD. Therefore, to apply successfully ESD we must incorporate functionally and constructively the dimensions of environmental, social, cultural, economical, technological and political issues and their interdependence in the modern world.







13. Cover of Tomorrow Today "Learning to build a sustainable future" (detail)  
© Tudor Rose and UNESCO

14. Cité des Sciences et de l'Industrie,  
Children's city, popularization of sciences, Paris, France  
© UNESCO / Dominique Roger





The Decade seeks to integrate the values inherent in sustainable development into all aspects of learning to encourage behaviour changes that allow for a more sustainable and just society for all, through four objectives:

- Facilitate networking, linkages, exchange and interaction among stakeholders in ESD;
- Foster an increased quality of teaching and learning in education for sustainable development;
- Help countries make progress towards and attain MDGs through ESD efforts;
- Provide countries with new opportunities to incorporate ESD into education reform efforts.



15. Executive Board Session, UNESCO, Paris © UNESCO/ Michel Ravassard

UNESCO, the lead institution for the implementation of the Decade, after consulting with a large number of governments and NGOs has developed the **International Implementation Scheme** for the Decade. This text is a reference point for all actors engaged in the decade and focuses primarily on how countries may implement their DESD goals. Implementing DESD focuses on seven building blocks:

- (a) Advocacy and vision-building
- (b) Consultation and ownership
- (c) Partnership and networks
- (d) Capacity-building and training
- (e) Research and innovation
- (f) Information and communication technologies
- (g) Monitoring and evaluation.



Covers *Technical Notes n° 2 and 3, ESD in action*, UNESCO Education Sector

Table 6 Strategic perspectives to inform Education and Learning for SD within the DESD

Socio-Cultural perspectives	Environmental perspectives	Economic perspectives
Human rights	Natural Resources – water, energy, biodiversity, agriculture	Poverty reduction
Peace and human security	Climate change	Corporate responsibility accountability
Gender equality	Rural development	Market economy
Cultural diversity & intercultural understanding	Sustainable urbanisation	
Health & HIV/AIDS	Disaster prevention & mitigation	
Governance		

“... Sustainable development has probably more moral context than scientific: it is connected with concepts of peace, human rights and justice, as well as with theories of ecology and of environmental problems. Although it is related to the natural sciences, the economy and applied political decisions it is mainly a cultural issue. It is related with human values and ways with which people are sensing their relation to the environment, natural and social. Additionally, it presupposes the acceptance and recognition of interdependence between humans and the natural environment, a fact which emphasizes that one should not seek to achieve social or environmental goals at the expense of others. For example, it is not possible to support the protection of the environment when half of the population of the planet live in poverty [...] sustainable development can not exist long term in a planet in which natural resources have been exhausted.” (DESD International Implementation Scheme, 2005)

## UNESCO Regional Guiding Framework of ESD in the Arab Region

The experiences of working and developing the Draft Regional Report on Decade of ESD in the Arab Region exercise were discussed and shared during a series of meetings outside the region. Main achievements of ESD/DESD during Phase One of the Regional Guiding Framework of ESD in the Arab Region (2005-2007) have been highlighted in the draft report, which among others include:

- Curriculum development in basic and secondary education.
- Training of teachers on selective ESD topics.
- Development of resource materials in Arabic.

The Guiding document for ESD in the Arab Region that came up from all this process is available from UNESCO's portal ([www.unesco.org/beirut/index.php?id=esd](http://www.unesco.org/beirut/index.php?id=esd))

Similarly, another dynamic initiative was undertaken by the 56 member-nations of the UN Economic and Social Commission for Europe (UNECE). The member countries adopted in Vilnius (2005) the **UNECE Strategy for ESD** with the primary purpose of encouraging countries to incorporate ESD into their educational systems, covering all levels from primary to tertiary including, vocational and adult, on the basis of both formal and non-formal setting. The Strategy is considered a flexible framework-text to be adapted by countries according to particular problems, conditions and priorities.

Among others, it provides the critical components for the setting up of National Implementation Plans, including, inter alia: the roles and responsibilities of the relevant stakeholders, financial issues, evaluation and monitoring, as well as schemes for international cooperation. Already in 2007 the baseline country data were

gathered, based on UNECE and UNESCO questionnaires, while a comprehensive set of indicators and descriptors have been finalised in 2008 by a group of international experts of UNECE. The same group developed also a core set of competences for teachers to teach ESD. All these documents are available at ([www.unece.org/env/esd.html](http://www.unece.org/env/esd.html)).

Designated Areas and MAB/BRs offer great opportunities to implement ESD allowing all kinds of "learners" to better implement ESD in terms of developing knowledge and influencing behaviours towards the various related fields: nature protection, consumption, local management, global thinking, etc. They constitute a rich in stimuli and pleasant educational environment, an **enabling environment**, for applying in a concrete way ESD in practice.

Table 7

### Locally relevant objectives of an ESD project in a designated area: Adapting the general goals of ESD to the framework of any designated area the following objectives are important

- To highlight the special characteristics of the region.
- To show the local problems as well as the possible solutions and ways of development.
- To empower local people for their involvement in the ESD project and the sustainable management of the region.
- To enable learners/visitors to contribute to the sustainable management of the particular region.
- To provide learners/visitors with pleasant experiences, which increase their belief in their potential to bring a change towards the region's sustainable development and their will to participate in similar projects.
- To stimulate and develop the positive attitudes towards the foundation, extension and sustainable management of BR & special designated areas.

16. A view of the Durmitor National Park, Montenegro  
© Markus Pacher

17-18. Pastoralism in the Durmitor National Park, Montenegro  
© Markus Pacher

19. Biking in the Durmitor National Park, Montenegro  
© Jean-Bernard Renier

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20. ESD class,  
Mujib BR, Jordan  
© RSCN



### 5.3 Approaches to the concept "environment" in light of ESD

The ways any individual interprets concepts such as "nature" and "sustainability" is to a large extent influenced by his/her value system. In the relevant bibliography the following three orientations influencing values and attitudes have been identified; (see Stern & Dietz, 2002; Franson & Garling, 1999; Schultz & Zelezny, 1999; Thomson & Barton, 1994; etc.):

**a. The egocentric** orientation attributes the caring attitudes for the environment in the concern for the personal gain. The environment is "useful" to the self and is seen as a means of securing the well-being, and financial gain for the individual.

**b. The anthropocentric (social-altruistic)** orientation treats the environment as a social good and attributes the pro-environmental attitudes in a wider context of

care and concern for the prosperity and well-being of the social whole.

**c. The ecocentric (bio-centric)** orientation looks at the environment as a whole, an integral part of which are humans. The positive attitudes are attributed to the belief in the environment's intrinsic value. The stand towards the environment includes also a "spiritual" dimension because of the biosphere's intrinsic value.

Already the Tbilisi Conference of 1977 looked at the environment in a holistic manner, integrating its physical parameters as well as those linked to human activity: "[...] the environment must be considered in its entirety; natural and anthropogenic, technological and social, economic, historic, cultural, ethical, aesthetic, etc."

These very dimensions were attributed also in the content of educational projects within MAB/BRs, once proclaimed:

21. Project-based Workshop,  
UNESCO World Conference on ESD, Bonn, Germany  
© German Commission for UNESCO / Kornelia Danetski





(a) The BRs as an object of learning, where related knowledge is developed i.e. about natural processes, human activities' impact to the ecosystem, interactions between the BR and development, etc.

(b) The BRs as the learning environment (laboratory) and the vehicle and means stimulating and facilitating the learning process in a pleasant way.

(c) The BRs as a holistic system including of course the local people, in which they develop responsibility, adopt positive attitudes and behaviours (actions) for the natural protection, the quality of life, the prosperity of the local community.

According to systemic theory, the environment is changed by the combined actions of natural, biological, societal, political and economic systems. Since the "Our Common Future" report of 1987, it became obvious that "environment and development cannot be separate challenges. Development cannot take place in an environment that is degraded and the environment cannot be protected when development does not take the cost of environmental destruction into account. Problems cannot be resolved separately, by fragmented institutions and policies, because they are interrelated."

### Global and local interdependences

ESD helps people to be aware of how the world works and how to act in making the world a more equitable and sustainable place. Nevertheless, today it is so obvious how people are linked to others on every continent:

- Culturally through movements of people
- Socially through the media and telecommunications
- Economically through trade
- Environmentally through sharing one planet
- Politically through international relations and systems of regulation.

Since 1992, following the Rio Summit with the evolving of economic globalization, it became all the more obvious that environmental issues entail conflicts of interest. From this viewpoint, environmental issues may be seen as social constructions for which some social groups treat as "problems" various phenomena, depending on their values and interests. Consequently, environmental issues extend and directly or indirectly link to societal changes. In our times, the concept of "environment" can no longer stand alone, and is included within the larger concept of "sustainability" which includes ecological and economic dimensions (Agenda 21 for Education in the Baltic Sea, 2002).

The importance of public awareness and participation in preserving the designated areas of any kind is highlighted in research. Public participation in developing and implementing actions for sustainable management contributes to a more sustainable society and promotes ESD, particularly when involving local actors and NGO's (Young, 2001).

### Ecological Footprint

The Ecological Footprint (EF) is a tool to measure and assess the pressure of human activities or population on nature.

It measures the amount of biologically productive land and sea area (expressed in global hectares or biologically productive hectares) a given individual, family, town, region, or human activity requires to produce the resources it consumes and to absorb the related carbon emissions. The Ecological Footprint compares this measurement to how much land and sea is available. Biologically productive land and sea includes area that is needed to support human demand for food, fiber, timber, energy and space for infrastructure and to support the management of human wastes. The use of global hectares as a measurement unit makes data and results globally comparable.

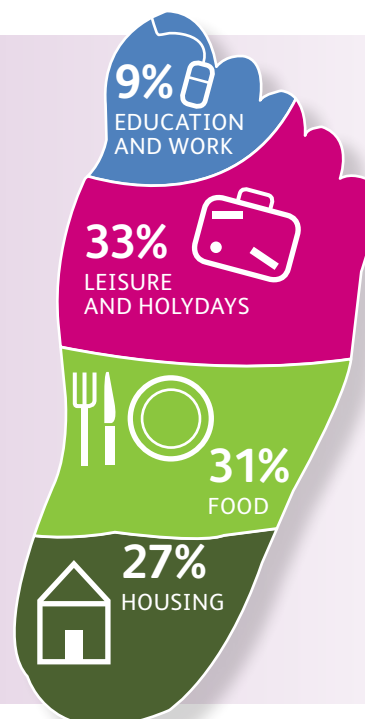
In that way, the Ecological Footprint always makes the connection to a global reference system and teaches how much we consume in relationship to how much the earth can provide. It is therefore not only an important tool for environmental education; it also transmits a feeling for issues like global justice and responsibility.

Conceived in 1990 by Mathis Wackernagel and William Rees at the University of British Columbia, the Ecological Footprint is now widely adopted by scientists, businesses, governments, agencies, individuals, and institutions working to monitor ecological resource use. It is used as a policy instrument and also as an educational tool.

Learning about the Ecological Footprint and the environmental performance of their school, calculating their impact, actually helps pupils to connect themselves directly to global SD issues as well as identify areas for action.

In that perspective, the UNESCO field Office in Venice, in collaboration with the Global Footprint Network, has developed a 3-year project model in order to apply the Ecological Footprint at the school level as a tool for achieving ESD. Biosphere Reserves can also be a testing ground for applying the Ecological Footprint in an educational context.

[www.footprintnetwork.org/en/index.php/GFN](http://www.footprintnetwork.org/en/index.php/GFN)



22. Calculation of the Ecological Footprint based on 4 main areas of resource consumption, ©WWF, Switzerland





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23, 25, 26, 27 and 30. ESD field visit in Bourgogne, Ecole Steiner-Waldorf, Verrières-le-Buisson, France © Hélène Gille

24. Learning to interpret marker signs in the forest © Hélène Gille



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28. Moroccan pupil in primary school, Tifelte, near Rabat, Morocco © UNESCO/Senna Abdelhak



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29. Workshop synthesis, UNESCO World Conference on ESD, Bonn, Germany © German Commission for UNESCO/Kornelia Danetski



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## 5.4 Research results on ESD in designated areas

People's interest and attitudes on designated areas and the natural environment in general are influenced by a variety of factors, and certainly not due to increased knowledge. In 1986-87, an important meta-analysis was published on pro-environmental behaviours forming the well known model of "Responsible Environmental Behaviour" (Hines, et al. 1987). The authors analyze responsible environmental behavior by identifying four elements in EE: (a) knowledge of environmental issues; (b) knowledge of specific action strategies to apply to these issues; (c) the ability to take action on environmental issues; and (d) the ownership of certain affective qualities and personality attributes. These elements can be used as a framework for constructing learning about global issues that is related and integrated to a student's life.

Following this study, in 1990, Hungerford and Volk proposed a modified model to predict responsible environmental behaviour, using three categories of variables:

- a. **Entry-level** variables are prerequisites or at least variables that will strengthen the decision-making. Environmental sensitivity is the strongest variable that is defined as "an empathetic perspective toward the environment" followed by the awareness, knowledge of SD principles and individual attitudes towards issues.
- b. **Ownership** variables concern issues that are important at a personal level. These variables, which appear to be critical to responsible behavior and a personal commitment to issue resolution include the in-depth knowledge of the dimensions of the issues (social, economic, etc.) and a personal investment in the situation (emotional, financial, etc.).
- c. **Empowerment** variables strengthen the sense that one can bring change and is able to solve problems. Knowledge and skill in using environmental action strategies is the best predictor of pro-environmental behavior because it brings self-confidence. *Locus of control* refers to the belief of an individual in his/her own ability to change things and circumstances. *Intention* to act is another important variable in this category (Read more on the models predicting behaviour in the annex).

Subsequently, the ESD programmes in BRs and other designated areas should develop activities that cover these variables in order to increase the potential for participants' responsible behaviours to manifest.

In terms of educational methodology for the development of knowledge, attitudes and skills, techniques and methods should be characterised by (adapted from Farmer et al., 2007):

- Direct experience.
- Raising emotional weight about the area.
- Developing strengthening participants' responsibility and ownership through small-scale restoration activities and similar methods.
- Creation of a learning environment that develops multi-faceted human potential, or in other words, all types of "intelligence" and related skills.

### Types of Intelligence

According to the Gardner Theory of Multiple Intelligences (1999) intelligence is an amalgam of distinct and independent capacities that act complementarily making an individual capable of solving problems and constructing products.

The eight types of intelligence are:

- **Verbal-linguistic:** ability to use language, dialogue, etc.
- **Logical-mathematical:** ability for inductive and creative reasoning, capacity to use numbers, understands abstract concepts, etc.
- **Visual-spatial:** ability to visualize objects, spatial dimensions, to create representational reality, etc.
- **Bodily-kinesthetic:** ability to control and express using the body, dexterity, etc.
- **Musical-rhythmic:** sensitive to rhythm and sounds, understands musical structure, etc.
- **Interpersonal:** ability for interpersonal communication, establishes relationships with others, etc.
- **Intrapersonal:** a degree of self-knowledge, objective reflection, etc.
- **Naturalistic:** ability to distinguish and recognize common elements of the geophysical space, e.g. flora and fauna and in socio-cultural spaces, e.g. between people and social groups, etc.

Research has shown that activity in the field and, particularly at local level, facilitates the better understanding of concepts, the critical thinking and problem-solving skills and "internalize" the *locus of control* (UNESCO 2002). The superiority of well designed field projects, as opposed to class-interventions in strengthening positive attitudes is suggested also in a meta-analysis of more than 100 published studies in the period 1993-1999 (Rickinson, 2001). Furthermore, Dillon (2003) argues that environmental educators have much to learn from the work done in the outdoor (non-formal setting), including BRs and special designated areas, field centres, parks, museums, etc.

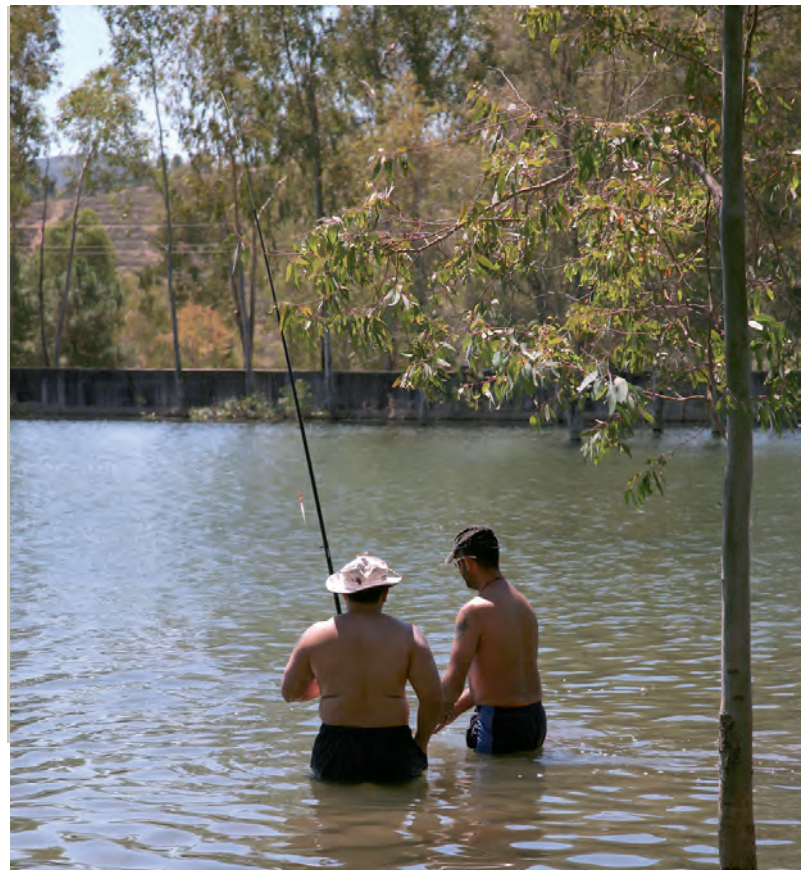
Given that ESD research, and particularly in BRs and protected areas, is still limited, it is considered appropriate to review and include major findings from relevant EE programmes that could be extrapolated for ESD in the following paragraphs.

31. Observing horsetail (*Equisetum spp.*),  
Ecole Steiner-Waldorf, Verrières-le-Buisson, France  
© Hélène Gille





32. *El Acebuche* visitors' center,  
Doñana BR, Spain  
© UNESCO/Olivier Brestin



33. Tourists fishing,  
Lake Aracena, Las Dehesas de Sierra Morena BR, Spain  
© UNESCO/Olivier Brestin

Table 8

## Research outcomes in a nutshell

### A. Special designated areas & the Public

Designated areas provide areas for relaxation and recreation and offer opportunities for awareness on related human activities, their potential threats, and ways to manage them.

A successful guided visit to the general public has the following characteristics:

- It develops a “sense” or an impression of the area.
- It provides the visitor with an enriching experience.
- It contributes to the area’s sustainable management.
- It includes interaction with management body staff (i.e. guards, rangers, etc.).

### B. Special designated areas & Students

Students benefit from activities in the field both in terms of gaining knowledge (see studies by Lindemann-Mathies, Kamarinou, Palmberg, Farmer, Vaughan) or of stimulating interest and positive attitude towards the sustainable management of the area (see Bizerill, Palmberg, Lindemann, Bogner, Dettmann-Easler), particularly in case of lengthy programmes (see Richinson, Dresner).

### C. Special designated areas & Educators

Educators identify organizational requirements, time constraints, bureaucracy and lack of relevant training as the main reasons discouraging them from implementing ESD projects in general. In addition, the following are identified as being important to effective ESD programmes in designated areas:

- Duration - programmes longer in duration are more effective than a one-day programme.
- Appropriate preparation prior to the visit and follow-up activities afterwards.
- Cooperation with scientists, relevant stakeholder bodies and participation of the local community in programme implementation.



## Research findings on designated areas and the general public

Scientists have studied the relation between behavior, participation activities and visits to natural environments. Cross reference findings indicate that people who took part in organized visits (e.g. camping, hikes, etc.) were more environmentally conscious as compared to those visiting for “bread-winning” activities (e.g. fishing, hunting) (Dunlap et al., 1975; Jackson et al., 1987; Schuette & Ostergen, 2003). Other research supports, in order for environmental guided tours to be successful, should (a) develop a “sense” or impression of the area (b) provide an enriching experience (c) entail a sustainability vision and objectives (Knudson et al., 2004).

Another research on the knowledge, behavior and attitudes of park visitors, aiming to develop eventually high quality experiential projects that would meet their expectations— emphasized that educational interventions in designated areas should include strategies to support responsible behaviors. Designated areas are places appropriate to (a) develop awareness on environment, (b) increase knowledge on ecosystem services and threats, (c) offer unique experiences of the relatively untouched environment and (d) offer authentic recreation (Negra and Mannign, 1997).

Admittedly there are many things a visitor can observe him/herself, in a designated area, like the natural environment, the human interventions and management approaches, etc. However, according to research, visits become more effective when the visitor has some interaction with the management staff, rangers, guards, etc (Toman, et al., 2004). It is worth noting that sustainable management and the successful operation of natural parks depends on the level of public support and participation (Dimopoulos & Pantis, 2003; IUCN, 1994; Kelleher & Kenchington, 1992).

Another research showed that the participation of those professionals working in the designated area, can have a positive impact in the ESD projects. According to their findings in the Montauk National Park (USA) Park, the more knowledgeable the fishermen of the Park were of the applied sensitization activities, the more eager they were to participate in tour or guiding activities, and the more willing to provide information to visitors. The majority of the informed fishermen were also convinced of the importance of education for the sake of the Park (Morgan & Soucy, 2006).

## Research findings on designated areas and the students

A study from the USA provides interesting insight to the perceptions of adolescents (12 - 15 yrs) on the concept “environment”. According to this, students understood the environment from a limited ecological perspective; a place that supports life and biodiversity without considering the anthropogenic factors. In this respect they did not consider humans as part of the environment but as something separate. The same study revealed that students were unable to recognize the matter and energy flows, as well as the interdependencies between biotic and abiotic factors (Shepardson, 2005, see also Richinson, 2001).

The study of Palmberg & Kuru (2000) showed that students who actively participated in outdoor field visits, primarily in designated areas, developed stronger ties to nature and displayed a greater sense of social responsibility than those who did not participate in such activities. Additionally, their confidence increased and specifically, they developed a perception of themselves as being capable of doing something important for the protection of the environment. Lindemann-Matthies (2002) underlined the added value of visits for the students with poor academic achievement, that generally improve their performance during field work. Kamarinou (2005) pointed out that field trips become more effective in stimulating interest when they entail a research character, in other words, when students investigate specific questions.

Tanaka (2007) showed the significance of natural experiences as a factor that increases sensitivity to the environment. According to his research many of those who take environmentally friendly actions have also had some unforgettable experiences in the natural field during their childhood, and they admit to the value of these experiences in developing their environmental responsibility in adulthood.

Another study of Brazilian students (11-17 yrs) found that those students who had greater contact with the natural local settings, including the designated areas, showed greater sensitivity for the environment. This study suggested that educational systems should aim to strengthen the relationship of students with the natural environment at local level as a means to develop positive attitudes and interest to participate in the management of their own areas. Positive steps in this direction include teaching students about management practices, comparing them, and studying how these have evolved (Bizerril, 2004).

Although there is extended research about the effectiveness of EE in the field, there is little data about the significance of pre-visit and post-visit activities (Smith-Sebasto & Cavern, 2006; Farmer, 1995). Farmer’s research (1995) showed that post-visit educational activities, consolidated students’ knowledge for a botanical garden.

34. Tourists bathing,  
El Pintado Lake, Las Dehesas de Sierra Morena BR, Spain  
© UNESCO / Olivier Brestin



Even fewer studies have focused on the long-term outcomes of field activities. Such a study took place in the Great Smokey Mountains National Park. One year after their visit most of the 9-year old participating students retained the knowledge gained from the program/visit and expressed pro environmental attitudes (Farmer et al., 2007). Similar results were found in studies by Bogner (1998) and Dettmann-Easler (1999) who looked at adolescents participating in EE few-days lasting programmes that were conducted in PA's (see Rickinson, 2001).

Vaughan et al. (2003) studied to what extent primary school students act as "sustainability messengers" to their families. Specifically, he studied if they reported of the knowledge and experience gained from an EE programme conducted over a 1-month period at the Scarlet Macaw Environmental Centre (Costa Rica). The study showed that not only did the parents learn from their children, but they also transferred that knowledge to their neighbours.

### Research findings on designated areas and the educators

Although educators, in general, express their interest in ESD field visits, they rarely implement such activities with their students, either because they are discouraged by organisational demands and bureaucracy or because they feel that they are lacking in skills and knowledge (Shepardson et al., 2002; Dresner, 2002; Goussia-Rizou & Abelioties, 2004). That is why Shepardson et al. (2002) insist that during their training, ESD educators must be actively involved in planning and designing ESD projects. Other discouraging factor for educators is the lack of time needed to prepare and implement ESD activities (Smith-Sebasto & Smith, 1997).

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The main reason educators/trainers are reluctant to implement ESD activities in MAB BRs and other designated areas is their belief that they lack the relative knowledge and pedagogical capacities (Paul & Volk, 2002). The lack of appropriate training is found in many studies as one of the most significant obstacles to implementing ESD in general (Volk, 1983; Dorion, 1990; Smith-Sebasto & Smith, 1997; UNESCO, 1997).

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On the other hand, those educators that feel they have a responsibility to contribute to the resolution of environmental issues, tend to involve their students more in environmental activities (Lindemann-Matties, 2002).

A study conducted on secondary level educators in the UK and their perceptions related to ESD approaches, showed that their notion of sustainability is affected, among others, by their perceptions on preservation, habitats and biodiversity (Gayford, 2001).

Another research was carried out on pre-service educators from three countries (United Kingdom, Denmark and Germany) in relation to their approaches towards SD and ESD. The findings emphasized on the "sense of responsibility" as a key factor in their role as teachers of ESD. More specifically, this research (Nikel, 2007) showed that teachers believe ESD helps to effectively respond to the following (these parameters should be incorporated in ESD programmes of designated areas when aiming to develop the learners' responsibility towards SD):

- Knowledge and implementation of decision-making "tools";
- Self-knowledge (autognosia, personal, attitudes, values);
- Consciousness and undertaking responsibility;
- Knowledge of effective action strategies to resolving issues.

In his meta-analysis, Richinson (2001) studied the effects on the attitudes and behaviours of those students who took part in EE programmes in designated areas, parks, BRs, etc. He found that the more effective programmes were those:

- That were longer in duration (several days long programs were more effective than one-day programmes);
- That included pre-visit and post-visit activities for the students;
- That involved the local community.

Brondy (2005) in his study on learning in nature showed that in places like Center Parks, Botanical Gardens, etc. learning to be meaningful should be based on real scenarios. Also the author supports that learning comes from experience of nature on three levels: action, thought and emotion.

A six-week long programme known as "Teachers in the Woods" was conducted for secondary school teachers in US National Parks. Trainees had to design their own field projects on the subject of forest, that they would later implement with their students (Dresner, 2002). Participants said that designing their own project helped them gain greater motivation, confidence and skills. The trainees attributed the success of the training to the ongoing support from the trainers and the direct experience in the field.

In addition, Dresner (2002) notes that an "authentic" ESD programme implemented in a designated area should have the following characteristics:

- Have clearly outlined and realistic objectives.
- Be flexible and adaptable in terms of time management.
- Includes information on legislation and management of the specific area.
- Draw high relevancy to the learner.
- Assign a role of facilitator to the teacher, rather than expert /transmitter of knowledge.
- Encourage active learner participation.
- Engage any stakeholder relevant to the areas' management (scientists, NGOs, local authorities, media etc).





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35. Zabljak, in the heart of the Durmitor National Park, Montenegro © Markus Pacher



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36. Young carvers from Berchtesgaden at the Federal horticulture show, Germany © MB of Berchtesgadener Land BR

37. Advanced study in handicraft in Mariestad, Sweden Göteborgs Universitet © MB of Lake Vänern Archipelago



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38. Wood turning handicraft, Sigonce, Luberon-Lure BR, France © UNESCO/O. Brestin

39. ESD field visit in Bourgogne, Ecole Steiner-Waldorf, France © Hélène Gille





### Results of MIO-ESCDE Research

MIO-ECSDE carried out a research in 2007 involving ESD senior educators, as well as staff of Management Bodies in Protected Areas and in EE/ESD Centres throughout Greece. The objective was to identify their needs in terms of training, development and implementation of ESD programmes in designated areas. The 72 collected questionnaires indicate some key findings, such as:

- 37.5% **are lacking knowledge** on management-related topics of the areas and 30.5% on decision-making for the area's management and public participation practices.
- 70.9% prefer participation in capacity building seminars and 68.0% opt for participation in related guided tours.
- Priority subjects for **training in ESD** are "Educational approaches of ESD" (69.5%), "The role of the teacher" (44.5%), "Research findings" (41.7%).
- Financial restrictions, bureaucracy and lack of materials and facilities were cited as factors **discouraging the implementation of ESD** in designated areas.
- **The needs in the workplace** that must be met in order for them to design and implement ESD in designated areas include: Training (17.6%); Financial support (16.0%); Infrastructure (10.4%); Facilities (8.8%); Teaching materials (8.8%).
- **Collaboration** is considered to be extremely necessary (68.1%) and very necessary (20.8%). Indicative areas for the design and establishment of related activities that were reported, include: Co-organising seminars (26.1%); Educational materials development (20.2%); Creating printed informational materials (12.6%); Informing local community (5.9%) and schools (5.9%).

## 5.5 Networks and collaborations supporting ESD

It is obvious that ESD-related subjects demand a wider range of collaborations; this is specifically emphasized within the UN Decade for ESD: "...the success of this Decade will depend to a great extent on the quality and strength of collaborations and networks within the ESD framework. Particular attention and importance is given to collaborations via networks that create a harmonious link between the educational community, governmental bodies and Civil Society".

Already since the early stages of EE, efforts have been made on an international, and especially European, level to establish educational networks between countries and organisations for the exchange of knowledge and experience on areas such as organisation, design and joint implementation of educational programmes (Giolitto, 1997). The first, coordinated international EE networks were grouped and developed in the 1990's by: (a) international organisations (e.g. UNEP, UNESCO, etc.) that supported the promotion of EE in educational systems around the world, (b) international NGO's for the environment and sustainable development (e.g. MIO-ECSDE, WWF, etc.), (c) individual countries or educational institutions.

The involvement in networks of EE advances the opening of the school to the society. In this framework, students, teachers and educators, may design and implement awareness raising activities, which also may have an input to the development of responsible environmental behaviour of students. The activities of such international networks are basically focused on the development and implementation of joint educational programmes, twinning of schools or other bodies, the production of educational materials, the exchange of visits, etc.

Table 9

### Some International Networks on ESD

**Eco-schools** that belongs to one of five international EE programs implemented by the Foundation for EE (FEE) in which 40 countries participate ([www.eco-schools.org/](http://www.eco-schools.org/))

**ENSI – Environment and School Initiatives** set up in 1986 to bring together school initiatives, educators and other stakeholders to promote activities for sustainable development in schools and their local societies ([www.ensi.org](http://www.ensi.org)).

**SEMEP – South-Eastern Mediterranean Environmental Project** for schools in the southeastern Mediterranean ASPnet the international school network ASP-Net Schools, under the auspices of UNESCO (for more information contact the UNESCO National Commissions).

**European Schoolnet** involving ~ 30 Ministries of Education in Europe and beyond, more than 10 years ago bringing about innovation in teaching and learning to its key stakeholders: Ministries of Education, schools, teachers and researchers, through policy, research and innovation, schools services and learning resource exchange ([www.eun.org](http://www.eun.org)).

**MEDIES – Mediterranean Education Initiative for the Environment and Sustainability** is a Mediterranean-wide E-network for ESD involving more than 3000 educators having three main areas of activities (a) Development of ESD material (b) Training on ESD (c) Promotion of ICTs. MEDIES is coordinated by MIO-ECSDE ([www.medies.net](http://www.medies.net)).