Environmental Education:
Its Evolution, ESD, Participation and Governance

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The concept of **Environmental Education (EE)** has evolved since the name of EE was used in the world community. It seems that the evolution has been strongly reflected from the needs and interests for the achievement of sustainable development and for the enhancement of quality education. This paper describes historical development of EE in terms of thematic areas and approaches, and the concept of **Environment and Population and Information for Human Development (EPD)** and **Education for Sustainable Development (ESD)** as the evolution of EE. After the discussion on the historical development, the role of Formal Education (FE) in the context of ESD is also described.

1. The Evolution of Environmental Education

The concept of EE was first formalised by the International Union for the Conservation of Nature and Natural Resources (IUCN), in 1970 at a meeting in Nevada, USA. At that meeting, Environmental Education was defined as:

> *A process of recognising values and classifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. Environmental Education also entails practice in decision-making and self-formulating of a code of behaviour about issues concerning environmental quality.*
>
> (IUCN, 1970[1])

Recommendation 96 from a **conference on the Human Environment held by the United Nations in Stockholm during 1972** stated that the Secretary-General, the organisations of the United Nations system, especially the United Nations Educational, Scientific and Cultural Organisation (UNESCO), and other international agencies concerned should, after consultation and agreement, take the necessary steps to establish the International Environmental Education Programme (IEEP), inter-disciplinary in approach, in-school and out-of-school, encompassing all levels of education and directed towards the general public, in particular the ordinary citizens living in rural and urban areas, young people and adults alike, with a view to educating them as to the simple steps they might take to manage and control their environment (United Nations, 1972[2]). Thus **Environmental Education was recognised** and its development was recommended by the world community **as a measure for the understanding, protection and improvement of the environment and its quality** (United Nations, 1972[3]; UNESCO-UNEP, 1976[4]). The **International Environmental Education Programme (IEEP) was established in 1975** and became a co-operative activity between UNESCO and UNEP, which had the following objectives: (1) access to information; (2) research and experimentation; (3) educational programmes and teaching materials; (4) training of personnel; (5) technical and vocational education; (6) educating and informing the public; (7) general higher education; (8) special training; and (9) international

[1] IUCN. 1970. *Environmental Education Workshop*. Nevada, USA.
[2] United Nations. 1972. *The United Nations Conference on Human Environment, Declaration on Human Environment*, United Nations, New York, USA.
[3] United Nations. 1972. *Ibid*
[4] UNESCO-UNEP. 1976. Belgrade Charter, *Connect*, Vol. 1, No. 1, UNESCO, Paris, France.

and regional cooperation. The IEEP organised many international and regional conferences and workshops (such as the 1977 Tbilisi and the 1987 Moscow congress) which developed programmes for delivering Environmental Education, developed the concept and meaning of Environmental Education, and proposed many recommendations and strategies.

The IEEP has supported a large number of projects in many countries. In its first ten years, it went through three phases of development. **The first phase of the IEEP (1975-1977) contributed greatly to the development of global Environmental Education awareness**. In this phase, as a part of the follow-up to the **1975 UNESCO-organised international Environmental Education workshop held in Belgrade**, regional meetings were held during 1976 and 1977 in Africa, the Arab States, Asia, Europe, Latin America and North America. These meetings brought together representatives from all over each region to review and evaluate the Belgrade Recommendations in more specific regional contexts prior to the **Inter-governmental Conference on Environmental Education which was convened in Tbilisi, USSR in 1977**.

At **the 1977 UNESCO-UNEP sponsored Tbilisi conference** a fairly coherent concept of Environmental Education as regards its goals, objectives, guiding principles, and models of implementation was drawn up. In cognisance with IUCN's definition (IUCN, 1970[5]), Environmental Education was defined as:

> *A process aimed at developing a world population that is aware of and concerned about the total environment and its associated problems, and which has knowledge, attitudes, motivations, commitments and skills to work individually and collectively towards solutions of current problems and the prevention of new ones*.
>
> (UNESCO-UNEP, 1978[6])

Further, regarding the aim of Environmental Education, the conference stated that:

> *[…] a basic aim of Environmental Education 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 the management of the quality of the environment.*
>
> (UNESCO-UNEP, 1978[7])

This definition of Environmental Education formed the basis of the Tbilisi Declaration, which identified five main objectives, i.e. awareness, knowledge, attitudes, skills and participation, and actions (UNESCO-UNEP, 1978[8]), as shown in Table 1.

[5] IUCN. 1970. *Ibid.*
[6] UNESCO-UNEP. 1978. *Inter-governmental Conference on Environmental Education*, 14-26 October 1977, Tbilisi, USSR. UNESCO-UNEP, Paris, France
[7] UNESCO-UNEP. 1978. *Ibid.*
[8] UNESCO-UNEP. 1978. *Ibid.*

Table 1: Objectives of Environmental Education

Objectives	Actions
Awareness	• To help social groups and individuals acquire an awareness of and sensitivity to the total environment and its allied problems.
Knowledge	• To help social groups and individuals gain a variety of experience in, and acquire a basic understanding of, the environment and its associated problems.
Attitudes	• To help social groups and individuals 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 social groups and individuals acquire the skills for identifying and solving environmental problems.
Participation	• To provide social groups and individuals with an opportunity to be actively involved at all levels in working towards the resolution of environmental problems.

Source: UNESCO-UNEP (1978)[9]

The 1977 Tbilisi conference also stated that Environmental Education stems from the reorientation of various disciplines and the establishment of links between them, **to facilitate an integrated and comprehensive perception of environmental issues and to encourage more rational actions to satisfy the needs of society** (UNESCO-UNEP, 1978[10]). Therefore, **the second phase of the IEEP (1978-1980) was primarily devoted to the conceptual and methodological development of Environmental Education** (UNESCO, 1985[11]).

In 1980, IUCN, UNEP and WWF published a report entitled **The World Conservation Strategy** (IUCN, UNEP and WWF, 1980[12]). **The report also contributed to the development of the concept of Environmental Education.** It addressed for the first time the issues of the conflict between environmental conservation and development. **The strategy introduced "development" as an important means of achieving conservation** (Eliott, 1994[13]), **that they were mutually dependent and hence introduced the concept of "Sustainable Development"** (Sterling, 1992[14]).

During the **third phase of the IEEP (1981-1985), emphasis was placed on the development of content, methods and materials for Environmental Education practices and training activities** (UNESCO, 1985[15]). This was the period in which an increasing number of countries realised the need to upgrade their own environmental programmes to deal more effectively with environmental problems and to officially introduce Environmental Education into their educational plans and reforms (UNESCO, 1985[16]). As a result of the practices, the concepts were further developed at the **UNESCO-UNEP Congress on Environmental Education and Training held in Moscow in 1987**. The congress document emphasised the needs and priorities in developing Environmental Education and training and suggested 42 international actions required in Environmental Education and training for the 1990s. The global strategy was provided to member states and institutions with

[9] UNESCO-UNEP. 1978. *Ibid.*
[10] UNESCO-UNEP. 1978. *Ibid.*
[11] UNESCO. 1985. *Activities of the UNESCO-UNEP International Environmental Education Programme (1973-1985)*, UNESCO, Paris, France.
[12] IUCN, UNEP and WWP. 1980. *World Conservation Strategy: Living Resource Conservation for Sustainable Development*. IUCN, UNEP and WWF, Gland, Switzerland.
[13] Eliott, J. 1994. *An Introduction to Sustainable Development: The Developing World*. Routledge, London, UK.
[14] Sterling, S. 1992. Mapping Environmental Education – Progress, Principles and Potential. *In* Filho, W. L. and Palmer, J. A. (Eds.) *Key Issues in Environmental Education: Volume 1*. The Horton Print Group, Bradford, UK.
[15] UNESCO. 1985. *Ibid.*
[16] UNESCO. 1985. *Ibid.*.

a framework for preparing their own national strategies for Environmental Education and training for the 1990s (UNESCO-UNEP, 1987[17]). Since the 1987 Moscow congress, which reflected on a series of IEEP activities, there seems to have been a shift in the emphasis of the IEEP. **The shift saw more emphasis put on the educational activities involved in Environmental Education rather than on the development of the concept and classroom activities in schools which had been promoted in the first ten years of the IEEP.**

In the same year as the Moscow congress, 1987, the ideas detailed in the World Conservation Strategy were substantiated by the publication of ***Our Common Future*****,** often referred to as the Brundland Report, by the World Commission on Environment and Development (WCED). Basically, this report called for a massive long-term campaign of awareness-raising on environmental issues and the importance of sustainable development, **the theory being that, if the public was better informed, then attitudes would change and people would feel a responsibility for the environment and take the necessary actions and decisions** (UNESCO-UNEP, 1988[18])**.**

In 1991, ***Caring for the Earth: A Strategy for Sustainable Living*** was published by IUCN, UNEP and WWF. This was a follow-up to the World Conservation Strategy and was targeted at policy- and decision-makers. **The strategy emphasised the importance of Environmental Education for sustainable development** and was based on a "conviction that people will alter their behaviour when they can see that it will make things better, and can work together when they need to" (IUCN, UNEP and WWF, 1991[19]).

International debate and discussions on the environment and sustainable development arising from the reports and publications, such as "***Caring for the Earth***" (1991), "***Our Common Future***" (1987), led to the second major conference of the United Nations, two decades after Stockholm, the **United Nations Conference on Environment and Development (UNCED) – the Earth Summit** in Rio de Janeiro, Brazil in 1992. In consequence, the Earth Summit resulted in five major achievements: (1) Agenda 21; (2) The Rio Declaration on Environment and Development; (3) a set of principles for the Sustainable Management of Forests; (4) the Convention on Global Climate Change; and (5) the Conservation of Biodiversity (Palmer and Neal, 1994[20]). Agenda 21 is a comprehensive account of actions needed in order to work towards sustainable development. In particular, with regard to the education, public awareness and training, **Environment and Population and Information for Human Development (EPD)** was lunched by UNESCO after the UNCED, where Agenda 21 was adapted as a global plan for sustainable development. It provided a comprehensive set of principle to assist governments and other institutions in implementing policies and programmes. The plan was to include economic, social and environmental considerations intertwined with issues of poverty, equity, the quality of life and global environmental protection.

Fien (1999) stated that the **theme of education has been central to discussion of sustainable development since the Earth Summit in Rio de Janeiro in 1992**. "Education" or a synonym (e.g. awareness and training) is the second most used noun in Agenda 21 – second only to the word

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[17] UNESCO-UNEP. 1987. *UNESCO-UNEP Congress, Environmental Education and Training, International Strategy for Action in the Field of Environmental Education and Training for the 1990s*, Moscow, USSR, UNESCO-UNEP, Nairobi, Kenya and Paris, France.

[18] UNESCO-UNEP. 1988. Sustainable Development via Environmental Education. *Connect*, Vol. 12, No. 2, UNESCO, Paris, France, pp. 1-3.

[19] IUCN, UNEP and WWF. 1991. *Caring for the Earth: A Strategy for Sustainable Living*. IUCN, UNEP and WWF, Gland, Switzerland.

[20] Palmer, J. and Neal, P. 1994. *The Handbook of Environmental Education*, Routledge, New York, USA.

"government" (Fien, 1999[21]). Chapter 36 (Promoting education, public awareness and training) of Agenda 21 is based on the principles laid down at the 1977 Tbilisi conference and states that:

> *Education including formal education, public awareness and training should be recognised as a process by which human beings and societies can reach their fullest potential.* ***Education is critical for promoting sustainable development and improving the capacity of the people to address environment and development issues.***
>
> (United Nations, 1992[22])

EPD was formally adopted by the 27th session of the UNESCO general Conference in 1993, when it was identified as one of UNESCO's immediate priorities, taking into account the recommendations of UNCED and the first International Congress on Population Education and Development, Istanbul (ICPED) in 1993. It was developed to focus on: (1) sustainable development taking into account the **importance of human dignity in improving the quality of life and of the environment**, while promoting a culture of peace, solidarity and international understanding; (2) **the diversity of life and the balance between reasonable human activities and the need to preserve natural ecosystem**; (3) a **global and local perspective with regard to the impact of global environment and population change**; (4) building human capacities, **promoting people participation and cooperation among people and institutions**, (5) **re-orienting and improving the quality of education** and the means to disseminate knowledge on aspects of human sustainable development (NIER, 2004[23]). Further, three principles were made the basis for the implementation strategies of EPD: (1) refinement of the knowledge-base and development of action framework; (2) development of new or re-orient education training and information programmes and materials and strengthening of capacities of member states; and (3) mobilisation of support of decision-makers and opinion leaders at international, regional and national levels in favour of project actions, with the cooperation of major news agencies.

Since 1992, much work has taken place around the world, especially within UNESCO in Paris and the Commission for Sustainable Development (CSD) in New York, to develop a clear vision of the roles for education fulfilling such high hopes (Fien, 1999[24]). However, the IEEP came to end in 1995; after that UNESCO, by itself, has continued to promote international activities under the name of EPD. There has been a related change in the size of conferences and workshops, from the large scale of international UNESCO-UNEP conferences in the 1970s and 1980s to the small scale of regional or sub-regional conferences such as the Thessaloniki conference held in 1997.

At the **1997 Thessaloniki conference**, the early concept of Environmental Education based on the improvement of environmental quality was further developed. This conference followed on from major meetings relevant to education for sustainable development held in Tbilisi in 1977, Jomtien in 1990, Toronto in 1992 and Istanbul in 1993 as well the series of United Nations conferences beginning in 1992 with Rio (environment and development) and followed by Cairo (population) in 1994, by Copenhagen (social development) and Beijing (women) both in 1995, and by Istanbul (human settlements) in 1996 (UNESCO, 1997[25]). **The Thessaloniki conference was designed to**

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[21] Fien, J. 1999. Promoting Education for Sustainable Future: Approaches to Regional Co-operation in Asia and the Pacific, *In* IGES. 1999. *International Conference on Environmental Education in the Asia-Pacific Region,* Proceedings, 27-28th Feb 1999, Yokohama, Japan, IGES and Environment Agency, Government of Japan.

[22] United Nations. 1992. *Earth Summit, Agenda 21: Programme of Action for Sustainable Development*. The final text of agreements, United Nations Conference on Environment and Development (UNCED) 3-14 June 1992, Rio de Janeiro, Brazil. United Nations, New York, USA.

[23] NIER. 2004. *Educational Innovation for Sustainable Development*, Final Report of a Regional Seminar 27 July – 3 August 2004, NIER/UNESCO-APEID

[24] Fien, J. 1999. *Ibid.*

[25] UNESCO. 1997. *Educating for a Sustainable Future: A Trans-disciplinary Vision for Concerted Action*, Proceedings, International

highlight the role of education and public awareness for sustainability, to consider important contributions in this context, and to mobilise action to this end (UNESCO, 1997[26]). The conference discussed the concept of education for sustainability, along with terms such as education for sustainable living, education for sustainable development and education for a sustainable future. A significant outcome of the conference was the adoption of a series of declarations collectively known as the Declaration of Thessaloniki.

According to Declaration 10 from the Tessaloniki conference, the concept of sustainability encompasses not only the environment but also poverty, population, health, food security, democracy, human rights and peace. Sustainability is, in the final analysis, a moral and ethical imperative in which cultural diversity and traditional knowledge need to be respected. Also, Declaration 11 stated that Environmental Education, as developed within the framework of the Tbilisi recommendations and as it has evolved since then, addresses the entire range of global issues included in Agenda 21 and recognised by the major UN conferences, and has also **become recognised as education for sustainability. This allows that Environmental Education may also be referred to as education for environment and sustainability** (UNESCO, 1997[27]). This means that **it is clear that the roots of education for environment and sustainability are firmly planted in Environmental Education**.

However, whilst the Thessaloniki conference was attended by 600 people, there were fewer than 10 delegates from the Asia-Pacific Region, which is perhaps an indication of the level of interest in Environmental Education in the region at that time. However, other possible reasons for the absence of delegates from the Asia-Pacific Region include: (1) distance; (2) lack of financial support; and (3) language problems. This suggests that much work remains to be done to reorient education in order to develop a regional perspective. After the Thessaloniki conference, inter-governmental organisations, governmental organisations and NGOs held many conferences and implemented programmes with the aim of developing **practical actions at national, sub-regional and regional levels**.

This review of international activities over the three decade revealed that the concept and meaning of Environmental Education has been defined and discussed by a series of international conferences supported by the IEEP and publications on sustainable development. IEEP activities have contributed to society in terms of developing recognition of the importance of Environmental Education, and also orienting the concept of Environmental Education and developing methods for its promotion. In addition, it can be said that the IEEP contributed to the integration of Environmental Education into existing educational programmes in various countries.

The third major conference of the United Nations, third decade after the Stockholm, **the World Summit for Sustainable Development (WSSD) - Johannesburg Summit** was held in Johannesburg, South Africa in 2002. Based on such movements on education towards sustainable development, establishing the **United Nations Decade of Education for Sustainable Development (UNDESD, 2005-2014)** was proposed by Japanese Government and Japanese NGO network and endorsed at the WSSD in 2002, and in December of the same year, adopted by the UN General Assembly with UNESCO designated as the lead agency.

Conference on Environment and Society: Education and Public Awareness for Sustainability, 8-12 December 1997, Thessaloniki, Greece. UNESCO, Paris, France.

[26] UNESCO. 1997. *Ibid.*

[27] UNESCO. 1997. *Ibid.*

2. United Nations Decade for Education for Sustainable Development (UNDESD)

UNDESD International Implementation Scheme (UNDESD-IIS) states that ESD has its roots in history of two distinct areas of interest of the United Nations: (1) quality basic education; and (2) environmental education for sustainable development (UNESCO. 2005a[28]). **Quality basic education** rooted for the promotion of basic education with universalizing access and promoting equity. It was developed based on a series of discussions: (1) the Declaration of Human Rights (1948); (2) Convention on Right of the Child – CRC (1989); (3) WCEFA and Jomtien Declaration on Education for All – EFA (1990); (4) WEF and Dakar Framework of Action (2000); (5) Millennium Development Goals, MDG 2-3 (2000-2015) and (6) United Nations Literacy Decade, UNLD (2003-2012). On the other hand, **environmental education for sustainable development** rooted for environmental education with some historical changes from EE, to EPD and ESD (in detail, see Chapter I. "the Evolution of Environmental Education").

According to the UNDESD-IIS, it is noted that the overall goal of the Decade was:

> *"…**to integrate the principles, values, and practices of sustainable development into all aspects of education and learning.** This education effort will **encourage change in behaviour** that will create a more sustainable future in terms of environmental integrity, economic viability, and a just society for present and future generations".*
>
> (UNESCO, 2005a[29])

Further, UNDESD-IIS states that the objectives of the UNDESD were to: (1) facilitate networking, linkages, exchange and interaction among stakeholders in ESD; (2) foster an increased quality of teaching and learning in education for sustainable development; (3) help countries make progress towards and attain the millennium development goals through ESD efforts; and to (4) provide countries with new opportunities to incorporate ESD into education reform efforts.

[28] UNESCO. 2005a. United Nations Decade of Education for Sustainable Development 2005-2014, *International Implementation Scheme*, UNESCO, Paris, France
[29] UNESCO. 2005a. *Ibid.*

3. Ten ESD Perspectives (Sato, M. et.al.2008)[30]

According to the DESD-IIS, characteristics of ESD are described as follows (Table 3).

Table 3: ESD Characteristics described in DESD-IIS[31]

Education for Sustainable Development:

- is based on the principles and values that underline sustainable development;
- deals with the well-being of all three realms of sustainability – environment, society and economy;
- promotes life-long learning;
- is locally relevant and culturally appropriate;
- is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences;
- engages formal, non-formal and informal education;
- accommodates the evolving nature of concept of sustainability;
- address content, taking into account context, global issues and local priorities;
- builds civil capacity for community-based decision making, social tolerance, environmental stewardship, adaptable workforce and quality of life;
- is interdisciplinary. No one discipline can claim ESD for its own, but all disciplines can contribute to ESD;
- uses a variety of pedagogical techniques that promote participatory learning and higher-order thinking skills.

UNESCO, 2005, International Implementation Scheme, UNESCO, Paris France.

For the development of ESD National Guidelines, the authors stress the following ten perspectives, based on review of some cases, i.e. Baltic Sea Region, UK, Germany, Japan, Australia, New Zealand (in detail, see Appendix-1), in particular are of great importance: (1) awareness of relationships; (2) contextualization of activities; (3) formulation of sustainability principles and concepts; (4) respect for environmental ethics and diverse values; (5) utilization of and learning with diverse educational methods and higher-order thinking skills; (6) interaction amongst diverse education community; (7) collaborative approach and capacity building; (8) social learning mechanism and creation of a lifelong learning system; (9) connections with international education initiatives; and (10) positive societal transformation.

3-1. Awareness of Relationships

The DESD International Implementation Scheme (DESD-IIS) (UNESCO, 2005) emphasizes that activities should be conducted with the three sustainability realms (environment, society and economy) in healthy condition. All countries are directly affected by social issues such as employment, human rights, gender, peace and personal safety, as well as by environmental problems such as water and waste. Additionally, all countries need to address economic issues such as poverty reduction and corporate responsibility and accountability. HIV/AIDS, immigration, climate change, and urbanization are all deeply related to the three realms of sustainability. As this is the case, when considering such global and highly complex problems, it is essential that one does not only consider them merely as environmental problems but also as social and economic problems and that one have an awareness concerning inter-phenomena relationships (***awareness of***

[30] Sato, M., Abe, O., Michel, A. 2008, From Tbilisi to Ahmedabad, Lessons Learnt from a Series of International Discussion on Environmental Education and Further Development of Environmental Education, Kankyou Jyouhou Kagaku, 37-2, 2008.
[31] UNESCO, 2005, International Implementation Scheme, UNESCO, Paris, France.

connectedness) to understand their interrelatedness / interdependency. One must also be aware of the various subjects that are involved. Awareness of inter-subject relationships (***awareness of inclusiveness***) -- such as between various organizations and stakeholders -- is particularly essential.

In today's environmental education one can see an emphasis on an ***awareness of connectedness*** and ***awareness of inclusiveness*** through cross-curriculum and interdisciplinary curriculum in the period of integrated studies. Education practices that emphasize this kind of ***awareness of relationships*** make it possible to create linkages with other educational initiatives dealing with various themes and enables improvement of awareness for sharing community resources, self-awareness and civic awareness.

3-2. Contextualization of Activities

The DESD International Implementation Scheme points out that, "ESD is based on local needs, perceptions and conditions, but acknowledges that fulfilling local needs often has international effects and consequences." On one hand, local contextualization (***awareness of depth***) linked with spirituality, culture and history is important. On the other hand, global contextualization (***awareness of scope***) linked with globalization and market economy is also important. In today's environmental education there are many examples of activities based in local context, however examples that are based on both perspectives. Local environmental education needs to be given meaning within a global context, not just its local. Additionally, awareness needs to be heightened concerning the international effects of local educational initiatives.

3-3. Formulation of Sustainability Principles and Concepts

The principles of sustainability have been highly debated throughout the 1990s. Today, debate continues about not only "sustainability of the natural environment / ecological sustainability" and "sustainability of the social environment / social equity," but also about "sustainability of spiritual environment / ethics, values, diversity," and there are linkages amongst all of these perspectives. The DESD International Implementation Scheme emphasizes the need for ESD to "accommodate the evolving nature of the concept of sustainability." To debate, learn and create this evolving concept of sustainability, will require educational practices based on a collaborative creation of values or "knowledge acquisition / linkage", not the traditional "transfer of knowledge".

3-4. Respect for Environmental Ethics and Diverse Values

The ways communities decide how to approach sustainable development will be closely linked to the values held in these societies. Understanding your own values, the values of the society you live in, and the values of others around the world is a central part of educating for a sustainable future. Each nation, cultural group, and individual must learn the skills of recognizing their own values and assessing these values in the context of sustainability. Which values to teach and learn in environmental education programmes is a matter for discussion. The goal is to create a locally relevant and culturally appropriate values component that is informed by the principles and values inherent in sustainable development.

3-5. Utilization of and Learning with Diverse Educational Methods and Higher-order Thinking Skills

In order to create the values of sustainable development and advance behavior and attitudes towards positive social transformation, ESD needs to utilize a variety of pedagogical techniques that promote higher-order thinking skills. In particular, problem-solving, vision-building, and consensus building cannot be accomplished merely with pedagogical techniques based on the "transfer of

knowledge". Utilizing participatory/dialog style learning and teaching methods in this process enable collaborative creation of values or "knowledge acquisition/linkage." Learning related to the development and application of these learning processes raises awareness and supports citizen independence based on participation and consensus building. Higher-order thinking skills such as systems thinking that considers the interdependency of phenomena, vision-building supported by future thinking, action research that repeatedly stimulates theory and practice, and participatory evaluation, heighten awareness related to time and relationships and contribute to the advancement of a collaborative approach and improved awareness.

3-6. Interaction amongst Diverse Education Community

The DESD International Implementation Scheme defines four major thrusts of education for sustainable development: (1) improving access to quality basic education; (2) reorienting existing education programmes; (3) developing public understanding and awareness and (4) providing training. In order to create ESD programmes that contain the four thrusts, all sectors of the education community will have to work together in a cooperative manner. Formal education (i.e., primary, secondary) will need to work closely with the non-formal education sector (e.g. non-governmental organizations, social education facilities) and with new partners from the informal education sector (i.e. the media and interpersonal communication). By weaving the context of ESD into environmental education, its significance as a life-long process will be strengthened and it will touch the lives of citizens at different ages.

3-7. Collaborative Approach and Capacity Building

In the development of environmental education, the role of educator varies greatly depending on the goals. In environmental education that aims to transfer know "about" the environment, the educator plays the role of "conveyor of knowledge". However, in environmental education that emphasizes experiential learning "in" the environmental, the educator plays the role of "field experience organizer". Additionally, in environmental education that focuses on environmental improvement and action "for" the environment, the educator plays the role of "fellow participant and inquirer". Having fully understood the different roles that educators play according to the goals of environmental education, it is important to conduct effective communication based on educational goals. A new collaborative approach that aims for a "knowledge acquisition/linkage" and is based on action, participation and dialog, is necessary in the context of ESD. Coordination and leadership are also necessary for adjustments.

Capacity building not only for individuals but also for organizations and citizens is essential when carrying out collaborative activities. The environmental education declaration of the Tbilisi Conference indicates that the subjects of environmental education are primarily targeting individuals (individual capacity building). However, capacity building of individuals is not enough today as we seek positive societal transformation. Capacity building of organizations and citizens is essential.

Of the seven strategies[32] put forth in the DESD International Implementation Scheme, organizational capacity (management, organization decision making, networking, partnerships, etc.) is indispensable. It would be difficult to accomplish the scheme merely with the capacity of individuals. In school education the **Whole School Approach** depends on the collective skills of the organization, not the individual. An essential factor is the entire school's involvement and linkages with the community. Another characteristic of ESD raised in the DESD International Implementation Scheme is citizen capacity building. Capacity building empowers citizens and

[32] (1) Vision-building and advocacy; (2) Consultation and ownership; (3) Partnership and networks; (4) Capacity-building and training; (5) Research and innovation; (6) Use of information and communication and (7) Monitoring and evaluation.

improves their awareness through vision sharing, community decision making, and improvement of community issues. A collaborative process requires effective communication, as are in the goals of environmental education, as well as capacity building for individuals, organizations and citizens.

3-8. Social Learning Mechanisms and Creation of a Lifelong Learning System

The role of environmental education as stated above must not just mean individual and organizational capacity building but it needs to create social learning mechanisms and a lifelong learning system in order for society to be more aware of learning. A report of the International Commission on Education for the Twenty-first Century21 "**Learning: The Treasure within**"[33] explored and recommended that lifelong learning be interpreted broadly as education for the development of humans. In particular the report identifies four pillars of education (1) learning to know, (2) learning to do, (3) learning to live together and (4) learning to be; in addition to the basic human right of access to learning. These pillars do not only link education and learning with various stages in life but also cross educational fields and learning opportunities. Based on the context of ESD, Dr. Sheldon Shaeffer, former director of UNESCO Asia-Pacific Regional Bureau for Education[34], has pointed out the need to add "**learning to transform**"[35] to the educational principals. Treating "transformation" as an educational principle creates an awareness of education for transformation of individuals and society and contributes to social learning mechanisms and the creation of a lifelong learning system.

3-9. Linking with International Education Initiatives

As can be inferred from Annex I of the DESD International Implementation Scheme, today's environmental education needs to consider not only "sustainable development and education" but must also be conscious of "improving access to quality basic education." In other words, it is important to situate the environmental education with respect to efforts in which the international community is already engaged. In particular the Millennium Development Goal (MDG)[36] process, the Education for All (EFA)[37] movement, and the United Nations Literacy Decade (UNLD)[38] have close links with various aspects of environmental education in a global arena.

However, the focus of Japan's environmental education has been limited within a national context and does not include the context of international education initiatives. The concept of sustainable development goes beyond the category of education; it is clear that it will affect all aspects of society

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[33] UNESCO. 1996. *Learning: The Treasure within.* The Report of the International Commission on Education for the Twenty-first Century. UNESCO.

[34] UNESCO Asia-Pacific Regional Bureau for Education

[35] Shaeffer, S. 2007. *Filling a Half-Empty Glass: Learning to Live Together Through Education for Sustainable Development*, Plenary Presentation, XIII World Congress of Comparative Education Societies, Sarajevo, Bosnia and Herzegovina, September 3-7, 2007.

[36] The eight goals and 18 targets of the Millennium Development Goals constitute an over-arching framework for international development cooperation, agreed at the level of the United Nations. The provision of primary education and gender equality in education are the two areas where the MDGs overlap with the EFA agenda – other aspects of basic education, such as literacy, quality and non-formal education, are implied as conditions for the realization of the MDGs.

[37] The six EFA goals are concerned with extending the reach of basic education to every child and adult and with the nature of such provision – it should be available to both female and male learners of all ages, offering relevant learning and life skills and striving for ever-increasing quality. While basic education is clearly intended to have a positive impact on the quality of life and on deprivation, the nature of this impact – and the content of education, which might be most appropriate to achieve it – is a broader question. In other words, the role and provision of education are central, and this drives the EFA agenda forward; the underlying purpose of education is either assumed or considered to be a matter for wider socio-political debate.

[38] The UNLD situates itself within the EFA movement, where literacy is a thread through all the six goals and a condition for their attainment. As a key instrument of learning, it must be factored into the realization of all forms and stages of education. There is no meaningful access to structured learning opportunities without close attention to the acquisition of literacy of sufficient quality. In some respects, the UNLD goes beyond the educational process, by demonstrating strategic links to other aspects of life – the acquisition and uses of literacy have an impact on mother and child health, on fertility rates, on income levels, as well as on less tangible effects such as an increase in self-confidence, initiative, participatory citizenship and cultural self-esteem.

and system frameworks. Linking environmental education with the concepts of sustainable development and improving access to quality basic education will enable social and development projects to internalize all of its goals. It is expected that environmental education will continue to be defined and develop based on its relationship to UNLD, EFA and other international education initiatives.

3-10. Positive Societal Transformation

The basic vision of the DESD from the International Implementation Scheme is "**a world where everyone has the opportunity to benefit from education and learn the values, behavior and lifestyles required for a sustainable future and for positive societal transformation**". This "positive societal transformation" has turned into an educational goal. Environmental education can no longer be limited to **education "in"** or **"about" the environment**; it must shift to "**transformative education**" that aims to create a sustainable society and emphasize attitudes, actions and values "for" the environment.

It is also essential to consider the "Infrastructure to support the DESD"[39] as outlined in the DESD International Implementation Scheme. By advancing a "**continuation of learning and collaborating processes**" and emphasizing the "**creation of learning mechanisms**," the context of ESD can be woven into educational activities and a "citizenship" which acts on local and global responsibilities can be obtained. It is necessary to stimulate the empowerment of citizens through such a learning spiral which aims to achieve a lifelong learning society.

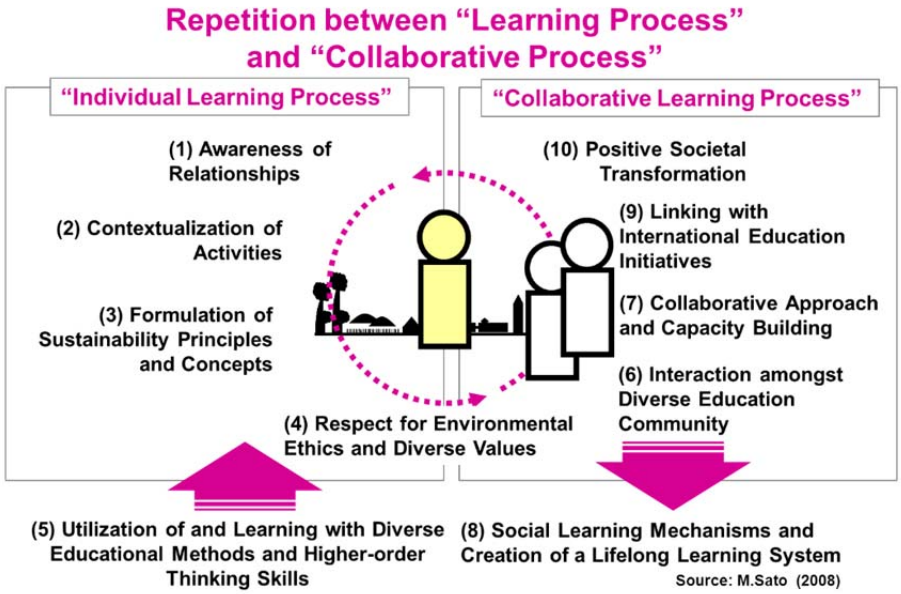

Figure 1: Repetition between Learning Process and Collaborative Process

[39] (1) Leadership; (2) Governance structures; (3) Administrative support; (4) Human resources; (5) Financial resources; (6) Material resources; (7) Accountability; (8) Evaluation, tracking and reporting; (9) Vision-building; and (10) Engagement and retention.

4. Education for Sustainable Development Goals (SDGs) (UNESCO, 2017)

The 2030 Agenda for Sustainable Development (Sustainable Development Goals, SDGs) has set out 17 ambitious goals to be achieved by the year 2030. Education is both a goal in itself and a means for attaining all the other SDGs. It is not only an integral part of sustainable development, but also a key enabler for it. For this reason education is an important strategy for SDGs. (UNESCO, 2017). This paper concludes by introducing some key highlights on ESD contained in UNESCO, 2017. These highlights are particularly of significance to Formal Education (FE) in the context of ESD.

4.1 Key Competencies for Sustainability

The following are key competencies needed to advance sustainable development. They describe the specific attributes individuals need for action and self-organization in various complex contexts and situations. Competencies cannot be taught, but have to be developed by the learners themselves. They are acquired during action, on the basis of experience and reflection (UNESCO, 2017).

Systems thinking competency: the abilities to recognize and understand relationships; to analyse complex systems; to think of how systems are embedded within different domains and different scales; and to deal with uncertainty.

Anticipatory competency: the abilities to understand and evaluate multiple futures – possible, probable and desirable; to create one's own visions for the future; to apply the precautionary principle; to assess the consequences of actions; and to deal with risks and changes.

Normative competency: the abilities to understand and reflect on the norms and values that underlie one's actions; and to negotiate sustainability values, principles, goals, and targets, in a context of conflicts of interests and trade-offs, uncertain knowledge and contradictions.

Strategic competency: the abilities to collectively develop and implement innovative actions that further sustainability at the local level and further afield.

Collaboration competency: the abilities to learn from others; to understand and respect the needs, perspectives and actions of others (empathy); to understand, relate to and be sensitive to others (empathic leadership); to deal with conflicts in a group; and to facilitate collaborative and participatory problem solving.

Critical thinking competency: the ability to question norms, practices and opinions; to reflect on own one's values, perceptions and actions; and to take a position in the sustainability discourse.

Self-awareness competency: the ability to reflect on one's own role in the local community and

(global) society; to continually evaluate and further motivate one's actions; and to deal with one's feelings and desires.

Integrated problem-solving competency: the overarching ability to apply different problem-solving frameworks to complex sustainability problems and develop viable, inclusive and equitable solution options that promote sustainable development, integrating the abovementioned competences.

4.2 Whole-Institution Approach

"ESD is not only about teaching sustainable development and adding new content to courses and training. Schools and universities should see themselves as places of learning and experience for sustainable development and should therefore orient all their processes towards principles of sustainability. For ESD to be more effective, the educational institution as a whole has to be transformed. Such a whole institution approach aims at mainstreaming sustainability into all aspects of the educational institution. It involves rethinking the curriculum, campus operations, organizational culture, student participation, leadership and management, community relationships and research. In this way, the institution itself functions as a role model for the learners." (UNESCO, 2017)

4.3 A learner-Centred Approach

"Learner-centred pedagogy sees students as autonomous learners and emphasizes the active development of knowledge rather than its mere transfer and/or passive learning experiences. The learners' prior knowledge as well as their experiences in the social context are the starting points for stimulating learning processes in which the learners construct their own knowledge base. Learner centred approaches require learners to reflect on their own knowledge and learning processes in order to manage and monitor them. Educators should stimulate and support those reflections. Learner-centred approaches change the role of an educator to one of being a facilitator of learning processes (instead of being an expert who only transfers structured knowledge) (Barth, 2015)." (UNESCO, 2017)

4.4 Action-Oriented Learning

In action-oriented learning, learners engage in action and reflect on their experiences in terms of the intended learning process and personal development. The experience might come from a project (in-service learning), an internship, the facilitation of a workshop, the implementation of a campaign, etc. Action-learning refers to Kolb's theory of the experiential learning cycle with the following stages: 1. Having a concrete experience, 2. Observing and reflecting, 3. Forming abstract concepts for generalization and 4. Applying them in new situations (Kolb, 1984). Action-learning

increases knowledge acquisition, competency development and values clarification by linking abstract concepts to personal experience and the learner's life. The role of the educator is to create a learning environment that prompts learners' experiences and reflexive thought processes. (UNESCO, 2017)

4.5 Transformative learning

"Transformative learning can best be defined by its aims and principles, rather than by any concrete teaching or learning strategy. It aims at empowering learners to question and change the ways they see and think about the world in order to deepen their understanding of it (Slavich and Zimbardo, 2012; Mezirow, 2000). The educator is a facilitator who empowers and challenges learners to alter their worldviews. The related concept of transgressive learning (Lotz-Sisitka et al., 2015) goes one step further: It underlines that learning in ESD has to overcome the status quo and prepare the learner for disruptive thinking and the co-creation of new knowledge." (UNESCO, 2017)

5. Summary

The concept of **Environmental Education (EE)** has evolved since the name of EE was used in the world community. It seems that the evolution has been strongly reflected from the needs and interests for the achievement of sustainable development and for the enhancement of quality education. This paper describes historical development of EE in terms of thematic areas and approaches, and the concept of **Environment and Population and Information for Human Development (EPD)** and **Education for Sustainable Development (ESD)** as the evolution of EE.

Thematic Areas Covered: In focusing on thematic areas covered by EE, EPD and ESD, some historical changes can be seen. EE focuses on the improvement of environment and its quality, then EPD focuses on the three aspects: (1) environment (quality and quantity); (2) development (economic, education, social services, and capacity building); and (3) population (size, growth, distribution, and structure). ESD expanded further, it includes three spheres-environmental issues like waste and how waste affects every nation, as do social issues like employment, human rights, gender equity, peace and human security, and economic issues such as poverty reduction, corporate responsibility and accountability. Further it includes overarching issues such as HIV/AIDS, migration, climate change and urbanisation (UNESCO, 2005). It can be said that the thematic areas of ESD are comparatively diversified than the conventional thematic areas of EE.

Approached Employed: Looking at the approaches employed, **special focus for EE was given to quantity focused, knowledge transfer, formal education as major focus, cause-effect relationship and problem solving, which were emphasised under the theory of RDDA** (Research, Development, Dissemination, and Adoption). **The RDDA approach is** characterised by a managerial-hierarchical system, technocracy, and positivistic epistemology, that learners were regarded as defective model, that experts and researchers take a role of knowledge/skills/ awareness providers. In consequence, teachers as passive technicians are dis-empowered and come to have recourse to technocracy. **While, in case of ESD, special focus is given to participatory-dialogical learning, high-order thinking and action research which enable to promote bottom-up approach, knowledge acquisition and its connection, construction of values and ethics, attitude change, life long learning through formal education, non-formal education and in-formal**

education. It also **respects accommodation to the evolving nature of the concept of sustainability**. By implementing with participatory-dialogical learning, high-order thinking and action research, "teachers" (school teachers, non-formal mobile teachers, NGO facilitators) are able to take initiative in organising and improving their educational activities. Further, the "teachers" are expected to be learners as well as facilitators, and to share the learning opportunities and implement collective actions and decision making. In this approach, individual capacity (value, ethics, high-orderthinking, attitude), institutional capacity (project management, institutional arrangement, e.g. partnership, networking and inter-linkages), civil capacity (participation and collective decision making), participatory teaching/learning methods and its process, decision making process and social support system, are the points to be considered for the promotion of quality education. The points described need to be inter-linked to the conventional points which encompass: content, teaching/learning methods and its process, teachers' capacity, learning environment and its access.

Note, this material is developed based on:

- [Sato, M. 2008. ESD policy and implementation at local level in Japan.]
- [UNESCO 2017. Education for Sustainable Goals: Learning Objectives]