Development of Higher Environmental Education Program

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Education for Sustainable Development is an investment in our future… each respective country should ensure that appropriate resources are made available for its development' - World Summit on Sustainable Development: Plan of Implementation (2002).

1. Introduction

The Global Development Research Center (GDRC) endorses and supports the initiative of the UN to designate the decade of 2005 - 2015 as the 'UN Decade of Education for Sustainable Development'. The UN-DESD is to start from 1 January 2005, extending to the end of the year 2015. The UN Decade of Education for Sustainable Development – ESD seeks to (a) incorporate quantitative and qualitative ESD indicators into on-going monitoring and evaluation of Education for All - EFA and the UN Literacy Decade; (b) monitor the progress of activities undertaken by UN agencies, Governments and NGOs in observance of the Decade and facilitate the implementation and follow-up; (c) evaluate the achievement of measurable results in achieving the aims and objectives of the Decade, particularly as regards the integration of ESD into national educational policies, programmes and systems; and (d) make recommendations to further promote ESD based on results and lessons learnt from the Decade.

The main thrusts of Education for Sustainable Development, originally identified in Chapter 36 of Agenda 21, have been expanded upon in the Work Programme of the UN Commission of Sustainable Development – CSD, reports of the major UN Conferences of the 1990's:

1. *Public understanding of the principles behind sustainability*. ESD has a major role in furthering the discussion of sustainability itself and the evolution of the concept from a vision to its practical application in culturally appropriate and locally relevant forms.
2. *Mainstreaming ESD*. This social process needs to be mainstreamed into all sectors including business, agriculture, tourism, natural resource management, local government and mass media, adding value to program development and implementation.
3. *Lifelong learning for all*. The quality life-long education and learning opportunities are required for all people regardless of their occupation or circumstances.
4. *ESD is relevant to all nations*. The realization that it is our most highly educated countries that create some of the greatest threats to a sustainable future for the planet, the reorienting of existing education programs in all nations to address the social, environmental, and economic knowledge, skills, perspectives, and values inherent to sustainability is also a major thrust of ESD.
5. *Specialised Training Programs*. The development of specialized training programs to ensure that all sectors of society have the skills necessary to perform in their world in a sustainable manner.

2. Promoting education, public awareness and training

Education, raising of public awareness and training are linked to virtually all areas in Agenda 21, and even more closely to the ones on meeting basic needs, capacity-building, data and information, science, and the role of major groups.

Programme areas described in Agenda 21 are:

a. Reorienting education towards sustainable development.
b. Increasing public awareness.
c. Promoting training.

PROGRAMME AREAS

A. Reorienting education towards sustainable development

Basis for action

Education, including formal education, public awareness and training should be recognized 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. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part

of learning. Both formal and non-formal education are indispensable to changing people's attitudes so that they have the capacity to assess and address their sustainable development concerns.

Objectives

Recognizing that countries, regional and international organizations will develop their own priorities and schedules for implementation in accordance with their needs, policies and programmes, the following objectives are proposed:

- Efforts should focus on reducing the high illiteracy levels and redressing the lack of basic education among women and should bring their literacy levels into line with those of men.
- To achieve environmental and development awareness in all sectors of society on a world-wide scale as soon as possible.
- To strive to achieve the accessibility of environmental and development education, linked to social education, from primary school age through adulthood to all groups of people.
- To promote integration of environment and development concepts, including demography, in all educational programmes, in particular the analysis of the causes of major environment and development issues in a local context, drawing on the best available scientific evidence and other appropriate sources of knowledge, and giving special emphasis to the further training of decision makers at all levels.

Activities

It is recognized that countries and regional and international organizations will develop their own priorities and schedules for implementation in accordance with their needs, policies, programmes and activities.

B. Increasing public awareness

Basis for action

There is still a considerable lack of awareness of the interrelated nature of all human activities and the environment, due to inaccurate or insufficient information. There is a need to increase public sensitivity to environment and development problems and involvement in their solutions and foster a sense of personal environmental responsibility and greater motivation and commitment towards sustainable development.

Objective

The objective is to promote broad public awareness as an essential part of a global education effort to strengthen attitudes, values and actions which are compatible with sustainable development. It is important to stress the principle of devolving authority, accountability and resources to the most appropriate level with preference given to local responsibility and control over awareness-building activities.

Activities

It is recognized that countries, regional and international organizations will develop their own priorities and schedules for implementation in accordance with their needs, policies, programmes and activities.

C. Promoting training

Basis for action

Training is one of the most important tools to develop human resources and facilitate the transition to a more sustainable world. It should have a job-specific focus, aimed at filling gaps in knowledge and skill that would help individuals find employment and be involved in environmental and development work. At the same time, training programmes should promote a greater awareness of environment and development issues as a two-way learning process.

Objectives

The following objectives are proposed:

- To establish or strengthen vocational training programmes that meet the needs of environment and development with ensured access to training opportunities, regardless of social status, age, gender, race or religion.
- To promote a flexible and adaptable workforce of various ages equipped to meet growing environment and development problems and changes arising from the transition to a sustainable society.
- To strengthen national capacities, particularly in scientific education and training, to enable Governments, employers and workers to achieve their environmental and development objectives and to facilitate the transfer and assimilation of new environmentally sound, socially acceptable and appropriate technology and know-how.
- To ensure that environmental and human ecological considerations are integrated at all manageri-

al levels and in all functional management areas, such as marketing, production and finance.

Activities

- Countries, with the support of the United Nations system, should identify workforce training needs and assess measures to be taken to meet those needs.
- National professional associations are encouraged to develop and review their codes of ethics and conduct to strengthen environmental connections and commitment.
- Countries and educational institutions should integrate environmental and developmental issues into existing training curricula and promote the exchange of their methodologies and evaluations.
- Countries should encourage all sectors of society, such as industry, universities, government officials and employees, non-governmental organizations and community organizations, to include an environmental management component in all relevant training activities, with an emphasis on meeting immediate skill requirements through short-term formal and in-plant vocational and management training.
- Countries should strengthen or establish practical training programmes for graduates from vocational schools, high schools and universities, in all countries, to enable them to meet labour market requirements and to achieve sustainable livelihoods.
- Governments are encouraged to consult people in isolated situations, whether geographically, culturally or socially, to ascertain their needs for training to enable them to contribute more fully to developing sustainable work practices and lifestyles.
- Governments, industry, trade unions, and consumers should promote an understanding of the interrelationship between good environment and good business practices.
- Countries should develop a service of locally trained and recruited environmental technicians able to provide local people and communities, particularly in deprived urban and rural areas, with the services they require, starting from primary environmental care.
- Countries should enhance the ability to gain access to, analyse and effectively use information and knowledge available on environment and development.
- Aid agencies should strengthen the training component in all development projects, emphasizing a multidisciplinary approach, promoting awareness and providing the necessary skills for transition to a sustainable society.
- Existing networks of employers' and workers' organizations, industry associations and non-governmental organizations should facilitate the exchange of experience concerning training and awareness programmes.
- Governments, in cooperation with relevant international organizations, should develop and implement strategies to deal with national, regional and local environmental threats and emergencies, emphasizing urgent practical training and awareness programmes for increasing public preparedness.
- The United Nations system, as appropriate, should extend its training programmes, particularly its environmental training and support activities of employers' and workers' organizations.

3. Education for sustainable development

Education for sustainable development, also known as sustainability education, or education for a sustainable future, arose out of the statement in Chapter 36 of Agenda 21 that education is crucial to sustainable development and that all countries should initiate national strategies for education for sustainable development. As a result, education in the context of sustainability is understood as a change process rather than a message or level which must be achieved. Another realization emerging out of the sustainability literature is that major problems cannot be solved from the standpoint of our current way of living but will require a shift from traditional ways of thinking and acting upon environmental problems. The sustainability approach aims to do things differently in the first place, instead of just cleaning up the symptoms of underlying problems. It moves away from "doom and gloom" approaches towards future oriented thinking and action.

In its essence, education for a sustainable future uses content from the environment, economy and society to organize learning processes that help understanding the evolution of human interaction with the environment through development, to analyze present realities, and to plan and participate in coherent processes of change toward a more sustainable future. This set of knowledge, skills and values, endorsed by representatives of all sectors of every society, is the framework for education for sustainability and the basis for much of the new curriculum planning taking place across the world. As can be seen, the framework integrates education about the environment, economy and society within a context of critical skills and the values of hope and commitment. In trying to define education for sustainability, it is important that it be seen in the context of other major educational movements in the world.

Education for sustainable development is learner-centered, providing learners with opportunities to construct their own understanding through hands-on, minds on investigations. Learners are engaged in direct experiences and are challenged to use higher-order thinking skills. Education for sustainable development supports the development of an active learning community where learners share ideas and expertise, and prompt continued inquiry. Also, this education provides real-world contexts and issues from which concepts and skills can be learned. It recognizes the importance of viewing the environment within the context of human influences, incorporating an examination of economics, culture, political structure, and social equity as well as natural processes and systems.

Through comprehensive, cohesive programs, learners explore how feelings, experiences, attitudes, and perceptions influence environmental issues. They become knowledgeable about natural processes and systems and gain an understanding of human processes and systems. They develop a sense of their rights and responsibilities as citizens, are able to understand the ideals, principles, and practices of citizenship in democratic societies, and they gain the skills necessary for citizenship. The awareness, knowledge, and skills needed for these local connections, and understandings provide a basis for moving out into larger systems, broader issues, and a more sophisticated comprehension of causes, connections, and consequences. Education for sustainable development fosters skills and habits that people can use throughout their lives to understand and act on environmental issues. It emphasizes critical and creative thinking skills along with other higher level thinking processes that are key to identifying, investigating, and analyzing issues, and formulating and evaluating alternative solutions.

4. A framework for curriculum development for higher environmental education

A framework for curriculum development for higher environmental education, especially good higher environmental education involves certain knowledge, skills and values.

- The knowledge needed for higher environmental education has to be about:
- The planet Earth as a finite system and the elements that constitute the planetary environment.
- The resources of the Earth, particularly soil, water, minerals, etc., and their distribution and role in supporting living organisms.
- The nature of ecosystems and biomes, their health, and their interdependence within the biosphere.
- The dependence of humans on the environmental resources for life and sustenance.
- The sustainable relationship of native societies to the environment.
- The implications of the resource distribution in determining the nature of societies and the rate and character of economic development.
- Characteristics of the development of human societies including nomadic, hunter gatherer, agricultural, industrial and post-industrial, and the impact of each on the natural environment.
- The role of science and technology in the development of societies and the impact of these technologies upon the environment.
- Philosophies and patterns of economic activity and their different impacts upon the environment, societies and cultures.
- The process of urbanization and its implications.
- The interconnectedness of present world political, economic, environmental and social issues.
- Aspects of differing perspectives and philosophies concerning the ecological and human environments.
- Cooperative international and national efforts to find solutions to common global issues, and to implement strategies for a more sustainable future.
- The implications for the global community of the political, economic and socio-cultural changes needed for a more sustainable future.
- Processes of planning, policy-making and action for sustainability by governments, businesses, non-governmental organizations and the general public.

Skills needed for higher environmental education include:

- Frame appropriate questions to guide relevant study and research.
- Define such fundamental concepts as environment, community, development and technology, and apply definitions to local, national and global experience.
- Use a range of resources and technologies in addressing questions.
- Assess the nature of bias and evaluate different points of view.
- Develop hypotheses based on balanced information, critical analysis and careful synthesis, and test them against new information and personal experience and beliefs.
- Communicate information and viewpoints effectively.
- Work towards negotiated consensus and cooperative resolution of conflict.
- Develop cooperative strategies for appropriate action to change present relationships between environmental preservation and economic development.

Values needed for higher environmental education are:

- An appreciation of the resilience, fragility and beauty of nature and the interdependence and equal importance of all life forms.
- An appreciation of the dependence of human life on the resources of a finite planet.
- An appreciation of the role of human ingenuity and individual creativity in ensuring survival and the search for appropriate and sustainable progress.
- An appreciation of the power of human beings to modify the environment.
- A sense of self-worth and rootedness in one's own culture and community.
- A respect for other cultures and recognition of the interdependence of the human community.
- A global perspective and loyalty to the world community.
- A concern for disparities and injustices, a commitment to human rights and to the peaceful resolution of conflict.
- An appreciation of the challenges faced by the human community in defining the processes needed for sustainability and in implementing the changes needed.
- A sense of balance in deciding among conflicting priorities.
- Personal acceptance of a sustainable lifestyle and a commitment to participation in change.
- A realistic appreciation of the urgency of the challenges facing the global community and the complexities that demand long-term planning for building a sustainable future.
- A sense of hope and a positive personal and social perspective on the future.
- An appreciation of the importance and worth of individual responsibility and action.

The aim of a good higher environmental education is to:

- Acquire skills, assess and apply complex management concepts in order to solve today's and tomorrow's environmental challenges.
- Gain knowledge in environmental sciences and their practical application.
- Train soft skills by working in international and interdisciplinary teams.
- Combine a theoretical orientation with practical project work.
- Give a range of practical techniques in such areas as environmental planning, environmental policy, environmental management systems (EMS), modeling, geographic information systems (GIS) and data management.
- Corporate social responsibility, logical framework analysis, life cycle assessment (LCA), and energy analysis and planning.
- Use different tools for project design, environmental monitoring, quality control and evaluation as well as planning.
- Train in using cost-benefit and cost-effectiveness methods.
- Understanding of the social and political implications of planning and management within the environmental field.
- Understanding of the relationships between companies and stakeholders, the environmental challenges facing businesses operating on international markets, and an introduction to various types of environmental regulations.

The aim of good higher environmental education is to enable students to work in or lead interdisciplinary teams to find solutions, using environmental sciences and management methods, so that they'll be skilled to devise integrative environmental knowledge and management solutions for complex environmental issues on a regional, national and international level, for the private as well as for the public sector. What has to be offered in the program of good higher environmental education is interconnected with the wide range of requirements in professional life; therefore the program of higher environmental education is designed to meet these new sustainability challenges, by integrating inputs from the social and human sciences into the study of environmental planning and engineering. The focus is on how firms, governments, and other organisations can support sustainable development in an economically efficient and socially acceptable manner.

The mode of teaching modes varies throughout the higher environmental education program and includes formal lectures as well as project-based individual and team studies, during witch students are asked to get actively involved in organisational and contents related aspects of the teaching program, giving feedback for a continuous advanced evolution of higher education for sustainable development and future.

5. Instead of conclusion: competencies of graduates of higher environmental education program for sustainable development

Competency checklist of graduates of higher environmental education program for sustainable development is given in table below (table1).

No.	Competency	Performance Criteria
1.	Apply environmental science and technology	o The impact of human activities on the environment is clearly understood and applied to environmental auditing. o The interaction of ecosystems is clearly understood and applied to environmental auditing. o General methods of environmental protection are understood and applied to environmental auditing. o Monitoring and measurement techniques for environmental management are understood and applied to environmental auditing.
2.	Apply environmental management principles	o Environmental managament principles are understood and applied correctly within the context of a given business/industry sector. o The intent and requirement of each clause of ISO 14001, or equivalent applicable environmental standard, can be described in the context of a given business/industry sector. o The relationship between environmental sciencies and environmental management principles and the environmental standards is explained within the context of a given business/industry sector. o Environmental procedures are documented in accordance with the environmental standard and environmental management principles. o Environmental procedures are implemented in accordance with the environmental standard and environmental management principles. o The environmental standard and its application are appropriate in the business/industry sector. o Evidence needed to demonstrate conformity to the requirements of the environmental standard is identified and collected. o The effectiveness of the entire environmental management system is evaluated within the context of a given business/industry sector. o The relationship between legal compliance and conformity to the environmental management system is demonstrated in the context of an audit in a given business/industry sector. o Environmental management tools such as aspect/impact evaluation, life cycle assessment, and environmental performance evaluation, are used appropriately within the context of a given business/industry sector.
3.	Apply environmental systems to different operational processes	o The product realisation processes and supporting activities are evaluated effectively in order to establish their environmental impact and verify the degree of conformity to the environmental management system. o Process-based activities and associated inputs, outputs, controls, and resources, are understood in different organizational contexts.
4.	Understand the application of environmental systems to different operational processes	o The product realization processes and supporting activities are evaluated effectively in order to establish their environmental impact and verify the degree of conformity to the environmental management system. o Process-based activities and associated inputs, outputs, controls, and resources, are understood in different organizational contexts.
5.	Assess the risk of significant environmental impacts and activities identified in the context of the organization's EMS management system	o The level of risk for each environmental impact is assessed to determine significance. o The risk assessment methodology used is soundly and scientifically and/or impact based, and is documented within the EMS system. o The risk assessment methodology used is appropriate to the business type or industry sector.

Table1. *Competency Checklist of graduates of higher environmental education program for sustainable development*

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