

Climate Change and Sustainable Development



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Meeting the Environmental Challenges**Dr. J. Maria Prema***Assistant Professor of Education, St. Ignatius College of Education, Palayamkottai.***Introduction**

Environmental issues became international priorities though they were seen as local or regional concerns, because they have become extraneous to economic growth, health, nature and aesthetics. Consumption of resources for products produced for world market cause primarily local environmental degradation-not global. However, the environmental consequences of natural resource consumption are often borne by people other than those who indulge in consumption. Environmental concerns reached global dimensions due to several factors, which have contributed to such developments. All industrialized countries continue to release a massive quantity of toxic material constituting heavy metals, hazardous chemicals, and acidic gases. In several areas, freshwater resources, soils, forests and habitats that support biodiversity are becoming severely depleted or degraded. Forests are resource centre for extremely diverse biological communities. With the loss of forests, there is a reduction in transpiration of water vapour into the atmosphere. Large forest areas in temperate regions are continuously being cut for the past more than hundred years. Wide-scale deforestation contributes to the greenhouse effect by reducing vegetation available to store carbon dioxide.

Achieving Sustainable Development through Education

Moving forward from the present situation requires the articulation of policies that can help establish an infrastructure for fostering environmental education. It further requires the formulation of steps that are broad in scope, relate to all learners, and can serve as catalysts for action. There are numerous approaches that can lay the foundation for a solid infrastructure for environmental

education. There is a need for policy changes at the Central, State, and local levels to encourage environmental education: develop, use and expand access to information technologies in all educational settings; and encourage understanding about how local issues fit into state, national, and international contexts.

Policy Changes

There is need to initiate strategic State and Central policy changes, including establishing necessary partnerships, as the foundation for a coordinated strategy for environmental education. State and Central departments have to invest in promoting the increase in knowledge and skills needed for the public to make informed decisions about the use and conservation of natural resources. Although some collaborative projects at the State and Central levels especially NCERT and SCERT are underway, the resources needed to sustain such efforts and maintain ongoing communication is a challenge.

National Activities

Priorities of the government should include the creation of jobs, educational reform work force training, economic competitiveness and environmental protection. How can we meet the needs of today without compromising the ability of future generation to meet their own needs? One solution is education; another is technology.

US Congress affirmed its commitment to education through bipartisan support of the Goals 2000: Educate America Act. The principles underlying Goals 2000 include: the need for high expectations for students; full participation by parents, teachers and communities in education; safe and discipline learning environments; quality teaching and professional development; effective and coordinated use of technology in learning; systemic reform; and custom-made school improvements. Goals 2000 provides national leadership to enable states and communities to raise academic performance.

Indian government can take similar initiatives. Some of which can include

1. Establishment of a Working Group to devise and coordinate the implementation of broad Central policies for environment education, ensuring an integrated set of Central programs directed high priority national needs. It can also help in the development of standards for environmental education materials and provide training on methods of evaluation of environmental education materials using existing information and databases.

2. Explore ways to coordinate resources, make environmental education more central to government programmes and increase funding of environmental education programs and research. Strategic planning and investment in long-range strategies to strengthen efforts in education and evaluate the effectiveness of such investment is not only necessary but is the key to the success of educational programs.

3. Assistance in identifying needs and responding with strategic programs and materials that tap the strengths of other departments and partners from the NGO sector is greatly needed. Continuous linkages and partnerships that are effective and resourceful would ensure that the educational community benefits from a coordinated effort to provide responsive programs and services.

State Activities

It is essential that States take the lead in infusing environmental education into the classroom. Development of programmes related to sustainable development varies from State to State around the country. Not even one State has incorporated this kind of programming fully into its formal and non-formal educational institutions. A given student may receive an environmental education unit in one or two classes in the primary school and possibly a specific subject on environmental studies in high school and no more. But environmental education should be infused into more subject areas and at all levels, if students are to develop interdisciplinary. Systems - based knowledge of the natural and built environments and the skills to participate actively in developing

a sustainable society and economy. It also should be reinforced in universities and colleges and outside the walls of the classroom. The challenge today is to encourage and support comprehensive programs that result in students getting committed to sustaining ecologically-sound and economically-viable communities, cities and regions.

Technology and Information

Society is being transformed by information and communication technologies, yet the application of this technology in the classroom is lagging. Success in advancing environmental education programs nationally and globally will depend to a large degree on the extent to which advanced communication systems such as the Internet are used to make information available to teachers, students and the public. Interactive information and communication networks have to be designed to facilitate the exchange of information on environmental education through the Internet, linking teachers, students and policy makers globally.

Information clearinghouses have to be established as a primary point of contact for incorporating and disseminating the vast array of information resources on environmental education available through print and electronic media. Students and teachers should be aware of the availability and utility of these systems. Appropriate education course should familiarize students with the types of database that exist, the methods for accessing them, and the ways they can be used to monitor environmental change and guide decisions about resource use and environmental protection.

Change in Education

Progress on the infusion of environmental themes into formal and non-formal education programs, business, communities and NGO's has been the result of a diverse grassroots movement that has succeeded despite many obstacles. The strength of the environmental movement, its range and diversity of programs, is also its weakness. Diversity sometimes results in duplication of efforts, lack of a shared vision and deprivation of the strength that comes from a common voice.

Required Initiatives – Potential Roles

Educational change cannot follow purely from mandates, whether State or Central, although such efforts can be effective as catalysts. Instead, change will emerge from grassroots initiatives, as the history of environmental education clearly demonstrates. Increasingly, the demand for education about the environment is being articulated by NGOs and civil society organizations. A balance between “top-down” and “bottom-up” approaches will be necessary for environmental education to realize its full potential. Grassroots activities will continue to drive progress through the bottom-up approach that has characterized the field to date. Government can assist, however, by continuing and improving its coordinating role, through funding, innovation and research. There is need to explore potential roles, priorities and next steps for the major stakeholders. The purpose here is to focus attention on the critical needs of environmental education, as they are seen today and suggest strategies for the future for moving forward.

Role of Teachers

Teachers should be at the forefront in pursuing the actions on environmental education, whether acting as individuals infusing environmental perspectives into their classes or collectively fostering environmental education through their educational institutions, professional societies, state infrastructures and local or national advocacy groups.

Role of Individuals

One of the effective ways individuals can contribute to the environment and ecology is by investing time and resources in educating themselves about the complex environmental and natural resources issues that affect their lives each day. Individuals of all ages can participate in and build on many of the initiatives through self-awareness, education and information exchanges with friends and colleagues. Success in environmental education depends greatly on individual initiative.

Commitment to lifelong learning is a way for individuals to gain the knowledge necessary to make informed decisions in their

personal and professional lives. They can enroll in adult education classes at their local community college or accompany their children. There are literally hundreds of actions individuals can take to learn (self-education) and help in achieving sustainable development.

Role of Youths

The tools needed to breathe life into efforts on environmental education include vitality, enthusiasm, the courage to tolerate change and a healthy sense of adventure. In short youths are a very important part of the process. Leaders from business, government, nongovernmental organizations and academic institutions can forge new initiatives to educate citizens about sustainable lifestyles. These initiatives can involve young people in this process from the beginning to insure their ownership and partnership as new policies, practices and activities are developed.

Role of Communities

A community is only as strong as the citizens who live in it. Forward-looking communities recognize that it is up to them to encourage new economic opportunities and ensure that local schools are training a workforce that will be prepared for new jobs in a changing world. A community can take the help of schools, local self-governments (municipalities / panchayats), and voluntary civic organizations to create opportunities for formal and non-formal learning that will prepare its citizens for a sustainable future. The single most important step is to initiate a serious long-term planning process that begins with envisioning sustainable practices appropriate to local conditions.

Role of Nongovernmental Organizations

Nongovernmental organizations (NGOs) play a critical role in advancing environmental education through research, publications, and training, funding and outreach activities for the public. Although some NGOs focus their efforts at the national level, others can be most effective and influential in the local communities.

Local community-based organizations can also play an important role in maximizing the strengths of the numerous stakeholders they serve. They can tap into the cultural viewpoints and norms, business and industry expertise, and the vibrancy of religious communities.

Role of Funding Agencies

Historically, non-governmental organizations have relied on the support of public and private agencies, domestic and foreign, to help finance work for the environment and education. Today, public sources of funding are diminishing, while the number of organizations seeking money is growing. It is therefore increasingly important that funding agencies participate in the national dialogue on goals and priorities for environmental education. Funding agencies, as stakeholders in the process, are ideally positioned to facilitate a broad, comprehensive approach to sustainable development by raising awareness about the interdependence of economic, social and environmental issues.

Role of Professional Organizations

Teachers Associations and other professional organizations can play a central role in the evolution of environmental education. In US, specialized professional and research organizations, such as the Center for Science, Mathematics and Engineering Education, the Global Change Research Program, National Council for Geographic Education and the American Association of Engineering Societies, have established committees or taskforces that focus sustainability and the environment. Efforts in India are led by National Council for Educational Research and Training (NCERT) and its counterparts at the State level – the SCERTs.

Role of the Business Community

Companies and corporations should have a direct interest in the quality of nation's educational system because the students of today are the workforce of tomorrow. If employees trained in the principles of sustainable development, for example, would be able to positively influence the production processes of their companies

to conserve energy and minimize waste of raw materials, then it would be an achievement.

Role of the Financial Community

The financial community—individual and institutional investors, banks and international financial institutions—can play a key role in funding educational activities. Advancing environmental education in the years ahead will require careful planning, vision, and commitment of leaders from the public and private sectors. Implementing some initiatives on environmental education could prove to be smart investments. The publication and dissemination of educational materials, for example, has long been a profitable industry. The development and commercialization of educational technologies, including computers and telecommunication devices, is a thriving industry worldwide. Institutions such as the World Bank and other development banks can influence the direction and level of effort devoted to environmental education activities.

Role of Governments

Environmental education requires active involvement of the State governments. States need to build a formal structure, such as an advisory council and a state coordinator for environmental education, which would enable them to play a leadership role in advancing environmental education. One option is to take legislative steps to further the initiative; which implies a responsibility for ensuring that the resulting programs are adequately funded. States can also enlist the private sector's assistance in supporting these activities. The central government should ensure that funds are carefully targeted toward high-priority national needs and that there are no duplicate efforts.

Role of the International Institutions

International action in the field of environmental education has risen steadily since the 1970s. Without question, the call for action has been delivered, and response has come from numerous international groups. The United Nations organizations that participated in the 1972 U.N. Conference on the Human

Environment in Stockholm were among the first to respond. This was more detailed in a U.N. document titled, *An International Strategy for Action in the Field of Environmental Education and Training for the 1990s*. Shared research, articulation of coherent strategies, and common resources accompanied by systematic dissemination of results at international level will add significantly to achieving a desirable and prosperous future. International cooperation will be a key to sharing trends in thinking, research and pedagogy.

Conclusion

Over the past decade, many countries, industrial, middle income, as well as developing countries, have initiated educational reforms. Several criticisms have been made of education such as irrelevant and 'old' curricula; disparities in education provision between the rich and the poor, the urban and the rural; low quality of education; and highly centralized management. There is now a question whether modern education as provided would adequately equip the young generation to take up the future challenges of the technology-driven, environmentally-degraded globalized world. Towards correcting this, governments have been advocating education for all.

References

- G.Lokanadha Reddy Mary Thomas, (2015), *Text Book of Environmental Education*, Discovery Publishing House Pvt.Ltd-New Delhi.
- Dr.Radha, (2011), *Environmental Studies for Undergraduate Course of all Branches of Higher Education*, Prasanna Publishers and Distributors
- Erach Bharucha, (2011), *Text Book of Environmental Studies for Undergraduate Courses*, University Grant Commission, Universities Press (India) Private Limited – Hyderabad.