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AN OVERVIEW OF ENVIRONMENTAL EDUCATION IN INDIA

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Abstract

There is no dearth of governmental and non-governmental organisations working for environment in India; but the aims, objectives and diversity in the manner of functioning could place before us the challenge of a lifetime. As scientists, workers and educators in India, we have the opportunity and the responsibility to discover, learn, understand, expand and utilise this complex resource situation, collaborating with like minded individuals and organisations to work and achieve common goals to protect the environment.

The way we focus today for education on the environment will have long term effects on the future quality of life. Effective and meaningful environmental education is a challenge we must take seriously if future generations are to enjoy the benefits of our natural heritage.

This paper identifies some of the current and future challenges that face environmental education in the Indian scenario and offers suggestions on how best they can be addressed.

Key Words: Environment, challenge, education, future, responsibility, India

Introduction

Environmental education is the most crucial component of efforts to solve environmental problems in any country. In India especially, it must be relevant to the needs and interests of both- urban and rural communities, despite their complexities and yet constantly adapt to their rapidly changing social and technological changes. Environmental awareness and education are the first steps to be taken on a war footing in any country. Aware, educated and motivated communities are an essential part of the success of any environmental programs, if they are to succeed.

In the new millennium, educationists in developing countries like India must come up with new knowledge, techniques and solutions that address the demands of the constantly evolving environmental challenges of the rural and urban scenario. Within the continuously changing social and technological landscape, environmental education must stay relevant to the needs and interests of the community. These challenges to environmental education require that we constantly examine, revise and modify the way we do research or train environmental professionals and educators. At the same the time the way we communicate environmental information to the general public is particularly important, if it is to be fruitful and achieving.

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Great progress has already been made in strengthening environmental education for the general public. This is particularly true in terms of defining environmental education and its objectives (Ruskey and Wilkie 1994). In the past few years Environmental Educators in North America have spearheaded an effort to develop mechanisms both to strengthen standards for environmental education and to make it possible to achieve them. A solid base for environmental education already exists. Why not in India or any other developing country for that matter?

The Ministry of Environment and forests is the nodal agency for a majority of environment based programs with emphasis on management and control of hazardous wastes, chemicals and micro-organisms. Periodically, under the Environment Protection Act, 1986 notifications are issued. The Central Pollution Control board may boast of 507 monitoring stations all over the country which have identified 13 heavily polluted and 26 medium polluted river stretches (India 2001). However, with regard to mass awareness programs relating to prevention and control of pollution, conservation or environment, there is a lot to be accomplished.

The Ministry to promote Environmental Education and awareness among all age groups and disseminate information has established a Environmental Information System (ENVIS) network "to all concerned" (India, 2001). The ENVIS network consisting of a decentralised information network for collection, storage, retrieval and dissemination of environmental education consists of 25 subject-oriented centres set up in various organisations of the country with an emphasis on priority areas of environment. Yet, perhaps the common man has no knowledge of its existence.
The Ministry has also been organising a much-hyped National Environmental Awareness Campaign since 1986. A month long awareness program chiefly confined to urban areas in India though appreciated leaves much to be desired in going a long way in educating the masses.

In India there is no dearth of organisations- governmental or non- governmental but the aims, objectives and diversity in the manner or styles of functioning could place before us the challenge of a lifetime. As scientists, workers and educators in India, we have the opportunity to discover, learn, understand, expand and utilise this complex resource situation, collaborating with like minded individuals and organisations to achieve a common goal. The way we plan today for public education on the environment will have long term effects on the future quality of life. Effective and meaningful environmental education is a challenge we must take seriously if future generations and we are to enjoy the benefits of our natural heritage. This paper identifies some of the current and future challenges that face environmental education in the Indian scenario and offers suggestions on how best they can be addressed.

1. THE NEED TO MANAGE THE COMPLEXITY OF THE INDIAN SITUATION

Environmental problems in India have become increasingly difficult to understand and to evaluate, yet the environmental issues that periodically make the headlines are more often expressed in the form of unorganised protests and confrontations rather

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than explained by sound reasoning towards workable solutions, protecting the environment. Moreover, reasonable treatment of environmental concerns often falls prey to the political agendas of those who have a vested interest in an unsustainable, resource-extractive approach to economic development. The need to express the complexity of modern environmental issues in simple understandable ways ensures that science plays a continual vital role in explaining and evaluating environmental issues and in forging solutions to environmental problems. Nor does the gap narrow for other environmental issues. Some measure of scientific faculty is necessary for comprehending these issues, and there is some evidence that the United States lags behind other industrialised countries in science and math education.

Educating the public about the importance of healthy ecosystems is vital to the protection of the environment, yet the accelerating pace of scientific discovery, the rapidly expanding role of information technology, and the increasing complexity of modern society tax traditional forms of environmental education. While there is a growing public awareness about environmental concerns, environmental illiteracy is still a major impediment to protecting our life support base.

Although some of the examples and education models may involve freshwater systems, the concepts behind the educational strategies can be applied to most other environmental settings. Some of the information presented here is applicable in other developing countries struggling with the challenges of environmental education. In the developing world the biggest problem is the shortage of water and the lack of clean supplies. When water is very scarce people have to make good use of it. That might mean using the same source of water for drinking and cooking, a place to wash, a place to clean clothing, pots and pans and a place to let domestic animals drink as well. Many people use the same water for a variety of purposes and each time the water becomes a little more polluted.

Imagine a river like the Gomti, a tributary of the Holy Ganga in Northern India that is the only source of water for a series of farming villages along its banks. The people in the first village might be very careful and always get their drinking water from above the village, do all their washing a little further down stream, and let their animals drink in the river as it leaves their village. By being very careful and aware of basic hygiene they can try to stay healthy. They can do very little to protect themselves from dead animals decaying in the river further upstream, or from germs and parasites introduced to the water by wild animals. As the river leaves their village the water will have been polluted by washed bodies, food scraps from washed pots and pans, and excreta from farm animals and village dwellers. The people in the next village will have to drink this polluted water, and will suffer from the diseases that accompany dirty water.

If an animal dies and falls into the only water supply for kilometres around, the people still have to drink the water. If the water is with high amounts of suspended particulate matter, filth, sediments or chemicals, but is the only water within reach, people have to drink it.

Whether the water source is a river, a lake or a well, the problems are similar throughout the developing world; not enough water to go around means that the same source has to be used for everything with the risk of pollution and disease very high. Consider the villagers fully aware with knowledge of the sensitivity of the

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situation. Their ability to evaluate and understand the implications of water pollution would be increased. Their attitude while utilising water and their skills in preventing water pollution would be at their best. Learners, in the process will have a role in planning and deciding their own future based on their decisions and the ability to implement them seriously. Given the complexity of the situation, critical thinking would develop and their problem solving ability sharpened.

The need for effective environmental education is set against a backdrop of environmental resource degradation on a global level (e.g., Gleick 2000, Postel 1999). The problems of water scarcity and pollution are likely to become more severe in the near future as the human population grows and changes in lifestyle necessitate more water resources (Postel 1992, 1998). The economic and cultural attributes valued by society are increasingly placed at risk by the degradation of environmental resources and the ecosystems that contribute to their resilience.

Firth (1998) stresses three points: Science and academia have pivotal roles in the development of the knowledge base about human--environment interactions; scientific information is the basis of wise decisionmaking, and this information must be made available to everyone in our society; and it is critical for citizens to understand scientific information--that is, how best to use that information and how it benefits society. Because public concern is often the impetus for formulating policy, scientists need to communicate technical information to the public more frequently and effectively (Bernabo 1995).

Administrative and curriculum reforms that focus on educating responsible citizens and future policymakers about stewardship of aquatic resources; the reforms also address the training of the next generation of scientists, who will help supply the knowledge necessary to reverse the damage already done to the world's lakes, streams, and wetlands, so that their usefulness may be preserved for the future. In a comprehensive list of requirements for science-based ecosystem management, Christensen and others (1996) noted the critical need for effective education including creative ways at every level of society; from school children to government officials. Besides, effective communication and education about environmental issues is equally important and no less challenging than basic scientific research.
Most citizens, including those in charge of policy, are not well informed or concerned about the relationship between the health of environmental resources and the economic and social institutions the citizenry enjoys. The ways in which science has traditionally interfaced with society must be re-examined and modified to address current environmental and social needs, and the scientific community must communicate effectively with policy officials about environmental information and the meaning of relevant research data if public policies are to reflect conservation principles (Karr 1993, 1999, Clark 1999).

In India keeping in mind the variety and diversity of the land, the situations and the people Environmental Education programs must be evolved keeping in mind the need:

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- to draw attention to the need for better, sensitive, more innovative, and responsive systems of education and outreach
- to develop in the common man a set of values for the concern of the environment, it's improvement and protection
- to study and gain knowledge of examples of successful education and outreach while creating new programs based on earlier experience
- to cultivate an open forum on effective environmental education and outreach programs fully motivating and actively involving skilled manpower
- to highlight philosophical and administrative issues that impede meaningful progress in improving public environmental education
- to evaluate environmental measures and education programmes in terms of social, economical, ecological and educational factors
- to provide opportunity for the common man to be actively involved at all levels of working towards the solution and resolving environmental problems
- to examine major environmental issues from a local, national, regional and international point of view

The will to communicate and educate effectively must be matched with programs and leadership that will result in meaningful changes in policy and resource management. Partnership efforts among different entities, such as educational institutions and government agencies, or private businesses and nongovernmental environmental organisations, are mechanisms that can spearhead effective environmental education. In India, the Directory of the Department of Environment lists more than 150 work in the field of environmental education and awareness. There are many excellent examples world-wide of such collaborative efforts (e.g., Bjorkland *et al.* 1997, Clarke 1999, Allen 2001, Newton 2001 and Hudson 2001) but they must be more, given the size of environmental challenges. Further, non-governmental organisations could modify educational programs to meet changing social needs and perspectives. In the last decade, the imperative of educating ourselves and our communities about conservation of aquatic resources through environmental education and outreach has been well articulated among scientists (Firth 1998).

Environmental education programs must create public opinion through the media, through newspapers, effectively using news reporters and the press. Scientists can communicate their work to the public and cultivate skills to communicate effectively through the media. This will help to educate the citizens by getting them fully aware and involved directly in all key issues of environmental awareness. Understanding, partnership building, development, goalsetting, funding and implementation would automatically follow in the community. He examines the effectiveness of some of the agency's environmental outreach and education techniques, which include national documents, national advertising campaigns, demonstration projects, primary and secondary education input, and local community outreach. The lessons learned from broad-based programs, which Newton summarises, can serve as starting points for other environmental education efforts. Professional scientific societies, such as the Indian Science Congress and the National Academy of Sciences are in a unique position to influence public perception and knowledge of our environmental resources. By aggressively working with other institutions and organisations, both

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governmental and nongovernmental, these scientific societies can influence and shape policies and on-the-ground activities that will help ensure that aquatic ecosystems are protected.

2. THE IMPORTANT ROLE OF SCIENCE AT EVERY STAGE

Moreover, at times there have been efforts to silence or underestimate the existing scientific underpinnings of environmental knowledge as a means of advancing an agenda that depends on an unsustainable, resource-extractive approach to economic development. This movement attacks environmental education almost across the board, claiming that the loss of biological diversity, declining health of aquatic resources, and human-induced climate change, among other issues, are not worth worrying about.

Environmental education must teach about science itself and about the use of the scientific method--an important supplement to the already present deep rooted belief systems and value judgements present in communities. This will help the common man to evaluate and respond to environmental threats in a better, more effective and efficient manner. Educational materials that omit the important role of science and the general rules of scientific inquiry are damaging to the field of environmental education. Their results are short term lacking far-reaching consequences.

The need to include science in educational efforts does not, however, excuse educators from the obligation to communicate in a simple, understandable way that invites further inquiry from those who might be intimidated by scientifically complex subjects. Each village, area or district may have to be dealt with in a different manner keeping in mind their understanding, ability, beliefs and language.

The Government of India should be responsible for the production of materials that explain scientific inquiry and provide mechanisms for farther exploration--is a critical component of environmental education. Various materials evidence this kind of approach, but two that deserve special mention are the *Paryavaran Abstracts*. These publications describe activities that can help sharpen scientific learning skills and provide resources and suggestions for obtaining farther information about aquatic resources. An extraordinary array of leading experts in the scientific community contributed to both volumes through the peer review process and editorial comment.

Science has provided the greatest evidence, to date, of the damage we have done and are doing to the planet. The need to rely on science to support environmental education programs and materials continues nonetheless, obligating NGO's, workers, scientists to learn new skills for communicating and making complex subjects understandable to the public.

3. THE NEED TO PLAN KEEPING DEMOGRAPHIC TRENDS IN MIND

Obviously, planning for environmental education must take into account significant demographic changes in India. What are those demographic trends, and how will they most likely affect the nature of environmental education? Rural and urban trends cannot be neglected. Potential environmental situations and aspects regarding growth and development must be integrated into the development programs of the community. Minority populations that may dominate population growth cannot be

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neglected. They must be provide opportunity in decision making and accepting the consequences. An increasingly diverse society, larger numbers of younger Indians in cities and family life that is geared around schedules rather than free time will all have important implications for environmental education. Clearly, environmental education must be of interest to, and available to, diverse audiences. There will probably be a need to utilise varied teaching and explaining methods to develop critical thinking and problem solving skills. Conducting programs for diverse audiences in different situations is not an easy process. It involves much more than mere linguistic translation, although language is important. Moreover, these programs must be designed to be sustainable within the communities they seek to involve. In India, rural communities would have to be catered for in a different manner than the fast moving urban community and some pioneering efforts show how this can be done.

More than seven centres of excellence to spread awareness research and training exist in India. Successful examples include Centre for Ecological Sciences, Bangalore, Centre for Environmental Education, Ahmedabad and the Environment Educational Centre at Chennai. More needs to be done for the average man who is involved in his community in his area.

The Earth Tomorrow program of the National Wildlife Federation for example, is targeted specifically at African-American, student populations, and a recent edition of the Federation's National Wildlife Week was issued in both Spanish and English (Flicker 1998, Rogers 1998, Tunstall 1998). The Roots & Shoots program of the Jane Goodall Institute has created a curriculum for diverse audiences with the help of numerous local organisations in Los Angeles with a particular focus on culturally diverse communities (McCarty et al. 1998). So what about India? Is it not possible for the Government of our country to evolve similar well organised, transparent programs?

Other trends in Indian demographics--the rapidly growing population of the country and the nature of family life-- also need to be addressed. The role of NGO'S takes an interesting approach: They could involve senior citizens, women folk and young people to monitor the quantity and quality of aquatic or forest resources, by appealing to their commitment to volunteerism and to the environment. Demographic changes in India in the 21st century will dramatically change for environmental education. If environmental education keeps pace with this changing scenario, the overall environmental movement will benefit by staying relevant to future generations and by inspiring individuals to take action to conserve natural resources and protect the environment. Lessons learned in the developed countries may well prove useful in the growth of environmental education in other countries as well, particularly those concerning materials and programs that effectively reach ethnically and culturally diverse populations.

4. THE NEED TO INVOLVE EDUCATIONAL INSTITUTIONS

Despite major initiatives by the Ministry to include environmental education in the educational curricula at all levels of formal education- primary, secondary and tertiary only Maharastra has included the subject in the school curriculum. The

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Ministry also provides financial assistance for the setting up of eco-clubs in schools and for organising seminars, symposia etc. on environment related issues.
A uniform, compulsory, broad based, down to earth, workable environmental educational strategy should be made available to all schools throughout the country keeping in mind the diverse situations of local environmental problems and language. The program should take root at the individual level where each enlightened child or adult realises that their individual effort is part of the change to come. In the present system, where efforts for change must start from the Ministers and bureaucracy and filter downward to the common man are days of dark clouds. Filled with loopholes and opportunities for misuse, funds rarely reach the lowest rung of the ladder or put to the very purpose for which they were sanctioned. Change must come with the complete educational awareness and participation of the common man. Efforts and projects must begin from grass-root level encouraging honesty and accountability at the lowest levels and moving upward.

The National Policy of Education 1986 envisaged that protection of the environment is a value to form part of school curricula. Similarly, the Environment Orientation to School Education initiated in 1988-89 envisages assistance to voluntary agencies for conduct of innovative programs aimed at promoting integration of educational programs in schools with local environmental conditions. The states too, are assisted for activities and review of programs at primary, secondary and tertiary levels to infuse environment concepts into the younger generation.

5. THE NEED TO RESPOND TO CHILDHOOD AND FAMILIES

In our childhood, it seems to today's adults, we had more opportunities than today's children to interact with nature directly, rather than through "virtual realities." Yet, today's child probably has access to more information about the environment than we did, Such media-inspired children may become fierce in their desire to save turtles in Orissa or vultures in Northern India. The challenge this pattern presents is not to supplant newer information sources but to complement them with a menu of linked opportunities that promote a continuum of experience, as well as learning that incorporates outdoor education and hands-on activities.
To reach families**,** effective strategies could be employed by the Government to create opportunities for parents, adult family members and others involved in care; to interact with children through simple community based programs, which can be developed in conjunction with the Forest department. What these and other outdoor-oriented programs could share is an understanding that the constitution of families and the nature of "family time" for all strata of society- rural and urban. Outdoor education programs in particular must be designed to provide opportunities for families to spend time together. Most important, these programs have to be fun and engaging to compete with other demands on families' time, and their outcomes must be both obvious and rewarding to the program participants.
The variety and richness of natural settings all contribute more than do manufactured indoor environments to physical, cognitive, and emotional development (Rivkin 1995).
In short, the changed geography of childhood means that environmental education programs must provide a continuum of experiences from online to hands-on. This

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generation of children also gets more knowledge about nature from television documentaries than from actual experience of the natural world. Instead, there is ample opportunity for ensuring that educational materials relating to, say, aquatic resources couple traditional cognitive learning materials with hands-on experience, whether it involves water quality testing or the restoration of a pond habitat in a village.

6. THE NEED FOR ACTIVITY-BASED LEARNING IN EDUCATIONAL INSTITUTIONS

One of the greatest challenges for education generally is to produce measurable results. Unfortunately, reaching this goal is neither easy nor devoid of the politics of testing and the endless philosophic debates over what constitutes marked increases in learning and knowledge. Environmental education, though not exempt from these issues, provides some exciting opportunities for enhancing learning, increasing understanding, sharpening observation and problem-solving skills, most often producing measurable outcomes.

A clear understanding of what we are educating our children for will give us guidelines on the structure of educational programs. There is a fair consensus among all involved in debates about educational reform that one of the principal goals of education is to enhance the ability of children to become productive members of society, as well as to advance a variety of skills that are productive for the development of children. It is in teaching both urban and rural children to become responsible and productive members of society that we are most likely to find significant and tangible benefits from environmental education.

In many school systems across India, students must devote a certain amount of time to community service as a prerequisite for obtaining secondary education or graduation. This requirement is not something that is added to the learning experience for purely altruistic reasons, but rather because community service is part of the learning-by-doing philosophy that has guided Indian education for centuries. Likewise, teaching about the environment is most effective if it incorporates activities that seek to produce tangible results, especially in immediate, local situations.

Activity-based learning often produces inclusive, economic and environmental benefits. For example, there could be a Campus Ecology program of the University Grants Commission in Colleges all over India entitled "Green India". The study projects undertaken on college campuses across the country would both improve the environment and generate money, which could be recycled into the project. These campus "greening" activities could address problems ranging from water conservation to reductions in sound levels, the use of pesticides or other toxic substances in landscaping and other campus activities. To reiterate, if one of the goals of education is to nurture the growth of productive members of society, then these kinds of programs are most certainly viable and valuable (Keniry and Lyon 1998).

Effective education requires the recognition of appropriate and meaningful strategies to help students discover more about the natural world, assemble information and facts, and solve problems.

Problem solving, for example, is an important, requisite objective of the educational process, and research by Gardner and others suggests that hands-on environmental

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activities are an effective means of enhancing problem-solving skills (Knox 1995). When students are invited to move their education beyond the walls of the classroom and engage in genuine action, they are given the opportunity to synthesise knowledge, skill, and character; to test their preconceptions and misconceptions against real experience; and to learn both to follow and to lead as members of a learning organisation " (Hammond 1997).
Environmental educators should emphasise the need for results as a particular strength of environmental education, especially those programs that can produce materials and experiences that cover a broad range of hands-on learning. Environmental education can and must lead from awareness to action. That message should be reflected in the program design and implementation, as well as in the way environmental education is defined and valued.

7. THE NEED FOR A POSITIVE SUSTAINED APPROACH AT ALL TIMES

Learning more about the environment generally means learning more about what we have done to the environment rather than what we have done to care for it. Although environmental education certainly requires learning about the resilience of nature, it is the catalogue of harm that will seem most evident to educators and students over the next several decades. The danger is of despair and a loss of hope for the future, that we as individuals cannot make a difference.
While estimating the environmental challenges we face locally and globally, and the achievements we accomplish, we must realise there are no short cuts to hard work and that alone will avoid the psychology of despair. One has to recognise those who are making a difference across nations, especially the younger generation and to celebrate their achievements. To avoid despair another method is to promote the belief that every individual's responsibility and action will make the difference. The environmental harm that world-renowned Jane Goodall witnessed firsthand over 40 years gave her ample excuse to be downcast and pessimistic about the future. Yet, acknowledging the challenges before us, her messages of hope were parts of her frequent lectures around the world; offering examples of individuals who have made a difference. Dr. Goodall's overall message is one of hope. She offers four forces that provide hope for the future: the power and creativity of the human brain to solve problems; the resiliency of nature once we approach it from a position of respect; the strength and vitality of young people around the world; and the indomitable human spirit (Goodall 1999).

While the study of nature would be incomplete without an interdisciplinary approach, discussing the threats to the natural world, an appreciation of nature should not be lacking in environmental education programs. It is teaching about the miracles of the natural world, more than anything else, which will engender a sustainable and creative learning environment.

Conclusion

Although great strides have been made in protecting environment in India, human population growth and an ever-increasing industrial use of its natural resources will continue to pose significant challenges to the protection of these basic resources. While environmental education is sometimes considered less important and gets less

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attention than other aspects of environmental protection. Through environmental education future environmental advocates and problem solvers are created. To create and mould young minds and a new generation of workers and leaders in the environmental field are immediate requirements. Environmental education must foster the general public's knowledge and concern for the environment, challenging them to respond effectively while effectively utilising educational establishments with integration of newer sources of information with experiential learning opportunities.

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