Chapter 9

Understanding Environmental Education

Introduction

Environmental problems have been subjects of popular discussions and debates from time immemorial. The result is a long history of educational campaigns and movements that eventually forged the way for the inclusion of environmental concerns into national and international policy and decision making. Environmental education has been recognised as a tool or mechanism for providing lasting solutions to these problems. This chapter starts with an exploration of some of the campaigns and movements. It then focuses on the development, forms, definitions, goals, objectives approaches and programmes of environmental education.

Ancient Landscapes Towards Modern Environmentalism

Swan (1975) and Cunningham et al. (2003) present a comprehensive report on the growth and development of environmentalism in the US. Swan suspected that even as far back as when man started using metals, dire predictions were being made about the survival of humankind. The ecologists of the day were already warning of the perils of tampering too much with the natural scheme of things.

Colonial times witnessed the birth, in the US, of the conservation movements. During that period, a few laws were passed to prohibit the burning of forests and to protect various wildlife species. Thomas Jefferson and George Washington warned against destructive land practices, as they feared an adverse economic impact. Later, Alexander Wilson and John James Audubon expressed concern about the extinction of certain wildlife species and sought their protection. Ralph Waldo Emerson and Henry David Thoreau were interested in the relationship between man and nature, and what could happen should there be dissonance. But despite the efforts of these and others, conservation still meant nothing to many people in the US, as they still believed that natural resources were inexhaustible. It was not until the publication in 1864 of George Perkins Marsh's book *Man and Nature* that this myth of resource inexhaustibility came under careful examination.

By the 1930s, several efforts had been made to conserve wildlife and wilderness by establishing hunting regulations and designating parks and refuges in the US. Yellowstone National Park was created in 1872, as the world's first national park. It is regrettable that up until today, most of the rural populations of developing coun-

tries, and even some members of the elite community, still believe in the inexhaustibility of natural resources. But before the 1930s, in the US, John Muir, John Burroughs and John Wesley Powell had contributed enormously to the concept of resource conservation and to the cause of aesthetic and wilderness conservation. Muir was a naturalist who was instrumental to the founding of the Sierra Club. Burroughs, a famous outdoor writer, popularised the study of nature. Powell is best known for his report to Congress on the management of the arid west, and his exploration of that region.

Educational efforts, following the conservation movements, gave rise to the educational movements. Aldo Leopold, a forester who later became an ecologist, was famous in this domain. He added an ethical dimension to the concept of wilderness preservation conceived by Muir and the others, and did much to make game and wildlife management a recognised profession.

Prior to Leopold's ethical concept, the justification of most conservation efforts was based on aesthetic, religious or economic grounds. Leopold pointed out that humans share the earth with other life forms; and that the well-being of each life form hinges on the well-being of every other life form. He based the land ethic on the ecological premise that since humans share the environment with all other life forms, it is their responsibility to maintain it in the best interests of the total community of life.

Of the many educational movements that emerged in Leopold's time, three were prominent: nature education (nature study), conservation education, and outdoor education. These movements, or subjects, are related and partially overlap. They are considered to be the forerunners of environmental education because of their contribution in content and methods to the subject. By 1971, many institutions of higher learning in the US were already offering environmental education courses.

In the UK, the earliest focus on environmental education was in 1943, when the Council for the Promotion of Field Studies was formed. This later became known as the Field Studies Council (Boulton and Knight 1996). The Field Studies Council heralded an upsurge of environmental activities related to the countryside (Wheeler 1981).

The need for environmental education grew more urgent in the 1960s as a result of the increasing evidence of environmental degradation. In 1960, the World Wide Fund (now known as the World Wide Fund for Nature, or the WWF) was launched to raise the level of public concerns about the rapid disappearance of species (Boulton and Knight 1996). Soon after, in 1963, Rachel Carson's book, *Silent Spring*, was published. This book drew popular attention to the potential dangers of the excessive use of pesticides. A few years later, a delegation from Sweden raised some of these concerns during a UN meeting. This initiative, together with the urgent American interest in the environment, which found expression in the United States National Environmental Policy Act, with its early phraseology about inter-generational equity, which came into effect in 1970 (Wood 1999), influenced the conference on human environment.

The Internationalisation of Environmental Education

The term environmental education was first recorded following a conference held under the auspices of the International Union for the Conservation of Nature and Natural Resources (now the World Conservation Union or IUCN) in Nevada in 1970. It first appeared on the world agenda after the United Nations Conference on the Human Environment held in Stockholm in 1972. The conference designated the 5 June as World Environment Day, and encouraged governments to celebrate that day every year by organising activities aimed at raising environmental awareness or ensuring environmental protection (Vinke 1993). Representatives at the conference recommended that the UN establish an international environmental education programme. In response to the recommendation, UNESCO sponsored a series of environmental education workshops and conferences around the world. Representatives from member countries met in Belgrade, in the former Yugoslavia in 1975, to outline the basic definition and goals of environmental education.

Another international conference was held in 1977 in Tbilisi in the former Soviet Republic of Georgia. More than sixty nations were represented at that conference. Delegates from the two conferences ratified the definition and objectives of environmental education. The conference recommended that environmental education should be directed to the general public at every age, at all levels of formal education, at specific occupational and social groups (administrators and planners, industrialists, agriculturists and so on) through formal and informal education. This is in consort with the popular Brundtland Report (Box 9.1) which identifies both formal and informal environmental education as tools for sustainable development. The report enumerates some informal methods that could be employed to promote environmental education; these include special interest groups and on-the-job training. It also stresses the need for a multidisciplinary approach to the subject.

Box 9.1: The Bruntland Report

In 1984, the United Nations established the World Commission on Environment and Development, otherwise known as the Brundtland Commission. The mandate given to the commission recognised the need to link long-term environmental strategies to those of development. It urged the commission to recommend ways by which concern for the environment could result in greater cooperation among developing countries and between countries at different stages of economic and social development. In 1987, the commission published its report, *Our Common Future*, also known as the Brundtland Report.

Defining Environmental Education

The definition of the environment was discussed in Chapter One. Education could be defined simply as a process that aims to effect a positive change in behaviour. It could also be defined as the behavioural change due to exposure to some kind of systematic training or experience. It is considered to be education for sustainability (IUCN 1993). It is a process of empowerment through equipping people with information in a manner that permits them to gradually, systematically and purposefully transform information into useful bodies of knowledge. It further equips them with the appropriate skills that enable them to apply the knowledge to the transformation of resources into goods and services for the betterment of society. Note the use of the expressions 'positive change in behaviour' and 'betterment of society'. These are used to distinguish good education, because a negative connotation would mean using the knowledge and skills acquired to instead produce intentionally what could be used to destroy society.

Environmental education was defined by delegates of the Belgrade and Tbilisi conferences 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 the knowledge, attitudes, skills, motivation and commitment to work individually and collectively toward the solution of current problems and prevention of new ones'. Put simply, environmental education is a process aiming to improve the quality of life by empowering people with the tools and mechanisms they need to solve and prevent environmental problems. It could also be defined as a subject that aims at changing the attitudes and perceptions of individuals with regard to the treatment and use of natural resources. It aims to inculcate in the individual a sense of accountability in the use of the limited natural resources.

Environmental education is concerned with the creation of conditions that favour modifications of attitudes or behaviour that have negative impacts on the environment. Environmental education increases awareness about issues by interrogating attitudes, perceptions, values and beliefs. It helps individuals to evaluate and clarify their feelings about the environment, and how they contribute to environmental problems. It also helps them to understand that there are conflicting values among people and that these conflicts must be addressed if environmental problems are ultimately going to be prevented or solved. In the same mode, WWF (1988a) states that it enables people to understand, analyse and evaluate the relationship between people and the environment.

Touré (1993) asserts that environmental education is not only an instrument in the fight against environmental problems, but also a precondition for the rational management of environmental resources needed for human survival. He further postulates that the efficacy of environmental education depends on the interest of the topic chosen, and on the role it can play in improving the income, hence the socio-economic situation, of the populations concerned. It is the demonstration of

the link between economic development and the protection of environmental resources that very often convinces the local population to take action. Communities will support environmental programmes only if they reflect their local beliefs, values and ideologies (World Bank 1992).

Scope and Forms of Environmental Education

Environmental education has hardly been given the scope and dimension it deserves in any single situation, due largely to disputes that exist about its goal. Schneider (1993) attributes this to the fact that in any given local or national situation, environmental concerns of individuals, groups of people, and even institutions, tend to be limited rather than embracing. Also, the capacity of these actors is limited by their place in society and by the means at their disposal. Hence, there is always a tendency in site-specific situations, for example, in a conservation project setting, to limit environmental education to areas such as agro-forestry, conservation and hygiene.

According to Dunlop (1993), environmental education covers forms of understanding and dimensions of behaviour. It must address values and beliefs regarding the political economy and quality of life in a society. It is also concerned with the distribution of power at all levels, not only within nation states, but across national boundaries, from supranational organisations or transnational companies. It must also concern itself with the fine details of the natural world, understanding the importance of maintaining intact all the links in the chain of being and survival.

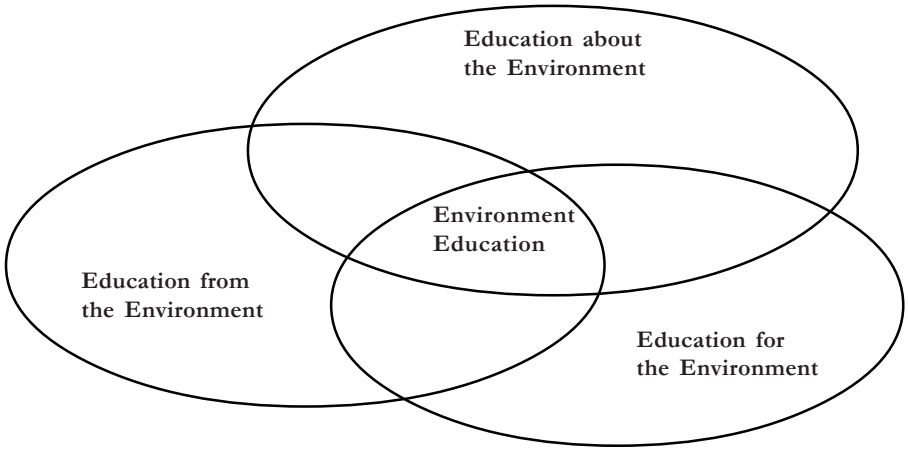
Martin (1990) summarises these thoughts in one of his guiding principles of environmental education: environmental education should consider the environment in its totality – natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic. This means that people should be able to develop an understanding of the ecological processes that govern life on earth; an understanding of the geo-morphic and climatic patterns that influence living things and human activities; an appreciation of the social, economic and cultural influences that determine human values, perceptions and behaviour; and an awareness of an individual's own personal relationship with the environment, as a consumer, producer and sentient member of society (WWF 1988).

There are three forms of environmental education: education about the environment, education from or through the environment, and education for the environment. These form what is sometimes referred to as the trinity of environmental education (Figure 9.1), which suggests inseparability. It also points to holism: looking at the 'whole' rather than at separate parts. The holistic approach is advocated by many experts. The reasoning is that none of the three forms can stand out separately, and significantly merit the name of environmental education. All three must be blended into a single 'whole' to give depth and breadth to the subject. Let us, for the purpose of study, consider them separately.

Education about the Environment

Here the main consideration is the acquisition of knowledge about the environment, including the various components, and how they interact and interrelate. Attention is paid to the problems facing the environment, their causes and possible solutions. This form brings us to stage one, which can be called environmental science or environmental studies, an important part of environmental education.

Figure 9.1: Trinity of Environmental Education



Education from the Environment

Put simply, this means using the environment as a teaching resource. Students carry out observations or experiments on different environmental aspects. Over and above gaining knowledge, appropriate skills and concepts are developed in the course of conducting experiments. These skills and concepts help equip and prepare the individual for environmental commitment. This is clearly an extension of the first form, and brings us to stage two.

Education for the Environment

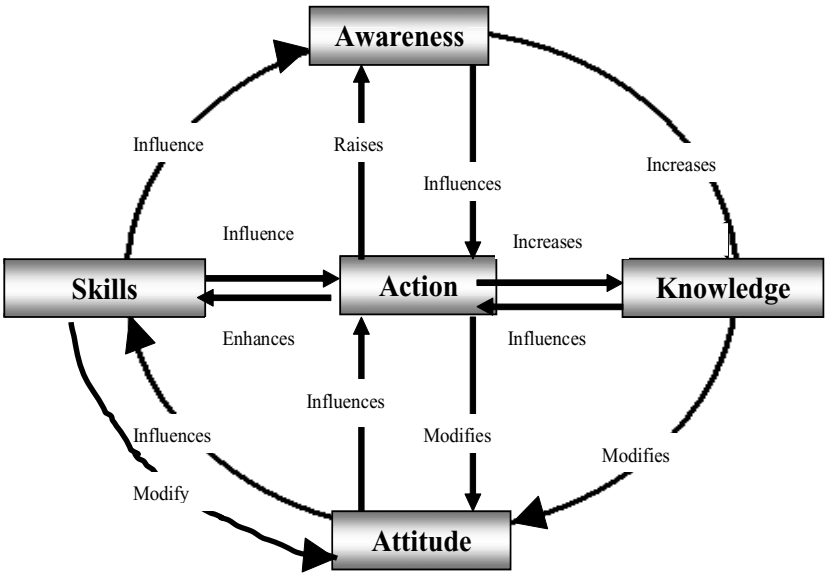
This form brings us to stage three, the last stage. It could be described as the stage of environmental commitment and action. This is where you can safely hope to achieve the goal of environmental education. Individuals use their knowledge and skills acquired to improve the quality of the environment in one way or the other. This should, however, happen voluntarily, without pressure from anyone or any external factor such as the threat of law-enforcement or promise of a reward. Should these be the motivating factors behind any action taken by an individual, we cannot safely say that the individual has acted because he or she has become environmentally educated.

Objectives of Environmental Education

The goal of environmental education is not to confer new behaviour on to individuals, nor to brainwash them into thinking in a particular way. Rather, it is to help them to learn how to think, including how to investigate and analyse, how to solve problems, make decisions, weigh opinions, and align values with personal actions.

Environmental education stresses five objectives: awareness, knowledge, attitudes, skills and action, which can be remembered easily by the acronym AKASA (Figure 9.2). These five objectives are synchronised with the three levels of learning: cognitive (knowledge), affective (attitudes and feelings), and psychomotor (physical or motor skills).

Figure 9.2: Interactions of the Objectives of Environmental Education



These objectives interact with one another to finally produce the core effects in the 'action' (Figure 9.3). It can be deduced that the intensity and impact of an action increases or decreases with the frequency of the action. This is largely influenced by the factors (including external influences), and level and direction of interactions that lead to a given action in a given situation.

Awareness

To help people become aware of the problems affecting the environment, their causes and possible solutions. The task here is to bring the people to genuinely examine their relationships with their environment with a view to identifying and appreciating the impact of such relationships on the environment.

Knowledge

To enable people to gain a better understanding of the various components of the environment, how they interact, interrelate and inter-depend with one another, and the natural and human factors that can cause a dissonance or total disruption of the interconnectedness and balance of the components. But the acquisition of knowledge is not in, or of, itself sufficient; the knowledge should be able to lead on to the formation of appropriate environmental attitudes and behaviour.

Attitude

To prepare and guide people to acquire environmentally appropriate social values, strong concern for, and sensitivity towards, the environment, and the motivation to actively participate in its conservation. People's values are the products of their perceptions, and the determinants of their actions. Their attitudes towards the environment are a combination of how they perceive it and how they think they ought to treat it. Noibi (1990) conducted research with a sample of fifty-five teachers, drawn from a population of 150 teachers who had completed a course in environmental education at the Lagos State College of Education in Nigeria. The results showed a significant correlation between environmental knowledge and environmental attitude ($r = 0.20, < 0.05$), indicating that knowledge about the environment could lead to the formation of appropriate environmental attitudes.

Skills

To equip people with the basic skills necessary to analyse and solve or prevent environmental problems, skills are the tools that prepare people for action, which can be triggered by an appropriate level of motivation generated from positive environmental attitudes.

Action

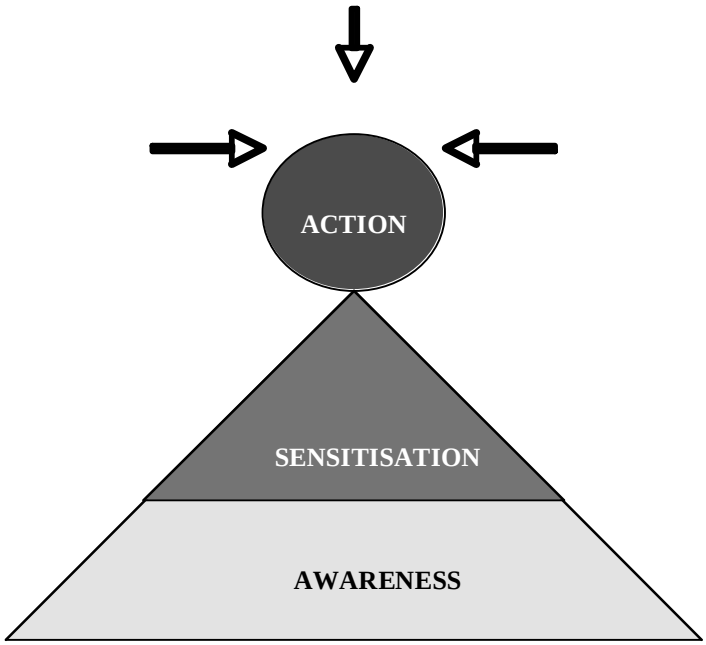
To enable people to develop a sense of responsibility and accountability towards the environment, and a commitment to take appropriate actions or participate actively to address currently identified environmental problems. As shown in Figure 1.2, action (also known as participation) occupies a central position. It is often observed following environmental education interventions, as proof of the effectiveness of such initiatives. Noibi's (1990) research showed a significant correlation between intended environmental action and actual environmental action ($r = 0.02, <0.05$), pointing to the possibility of intentions, leading to desired goals. But environmental attitude was shown to have no correlation with actual environmental action, whereas its correlation with intended environmental action was highly significant ($r = 0.57, <.01$). A simple explanation for this could be that external factors might have had, and do have, an influence in deciding whether or not the actual environmental action is realised.

Environmental Awareness and Sensitisation

A majority of environmental agencies and organisations set the goal of raising awareness or sensitising target populations to particular or general environmental concerns and issues. Although these are two different sub-targets in terms of level, with sensitisation occupying a higher echelon (Figure 9.3), the agencies and organisations invariably aim at the same ultimate target: action. However, it should be noted that it takes greater effort and more expertise to sensitise than to raise awareness.

Raising the awareness of a target population to environmental issues can lead to, but is no guarantee of, their sensitisation. To raise environmental awareness is to make the target population conscious of the prevailing environmental issues and possible solutions; whereas to sensitise them is to stimulate their feelings in such a way that they develop concern and a responsible attitudes for the environment. Sensitisation could also be defined as a process by which people are enabled to develop a set of beliefs, values and attitudes that can positively influence their perception, treatment and use of the environment and its resources.

Figure 9.3: Awareness and Sensitisation Occupy Different Levels



Sensitisation can lead to the cultivation of positive environmental attitudes, which, in normal circumstances, translate into positive environmental behaviour, best expressed in actions. To reach this final stage is not easy; it depends on the level of sensitisation of the individual, which increases with age, not merely in biological terms, but with respect to an accumulated attachment to particular ideas and values (Patterson 1993). It may occur as a result of subtle but powerful influences, such as

advice, and examples of the family and peer groups, rigorous norms and belief systems of the community, patterned indoctrination through programmes of the mass media, schools and similar institutions, or emerging economic and related opportunities. This suggests that formulating appropriate strategies for changing or modifying the general attitude of a particular group of people towards the environment may require a historical journey in time and space to establish what the attitude was originally, and why, how it evolved over time into its present form, and the factors responsible for its evolution. Knowledge of all this is crucial to the formulation of an appropriate sensitisation strategy. A multiplicity of methods could be employed to bring about sensitisation and the desired change in attitude.

The effort required to sensitise an individual increases with the age of that individual. This explains why experts advise that environmental education be given to people in their childhood, while they are still in elementary school, so that by the time they reach the age where they tend not to listen to advice, their values and attitudes will have been cultivated already, and will remain an important part of their lives. On the other hand, starting environmental education with people at adulthood presents great difficulties, especially if the values and attitudes they have developed from childhood are in opposition to the tenets of the new discipline. These childhood experiences that have become oppositional forces, are enhanced by the cultural, economic and political climate in which people are born and nurtured.

Organisational and Institutional Arrangements for Environmental Assessment

Although many countries have not yet incorporated environmental education into their school systems, there are many institutions and organisations that provide excellent examples of environmental education programmes, aimed at both schools and the general public.

Botanical and zoological gardens offer opportunities for broad-based environmental education (Boulton and Knight 1996). Both children and adults benefit from guided tours, outreach materials and other educational services provided by these establishments. Museums, too, have changed their traditional focus on exhibits to include special educational programmes.

National parks and other protected areas are now playing an increasingly significant role in the promotion of environmental education. Many have information centres, which carry out educational activities ranging from audio-visual shows, interactive displays, printed materials to educate the casual visitor tourist, and display notices, whilst special programmes are arranged for school groups. Some examples of the above establishments also provide opportunities for teachers to receive training in environmental education. The Bronx Zoo in New York offers a good example of well designed programmes of teacher training in this domain. A number of institutions offer specialised courses in environmental education tailored to the needs of the participants, for example the International Centre for Conservation in the

UK. Some universities in both developed and developing countries are now offering certificate, diploma and degree courses in environmental education.

Prerequisites for the Implementation of Environmental Education

Before implementing an environmental education programme, it is absolutely necessary to carry out certain tasks, which could help place the implementer in a position to make informed decisions. These tasks consist of carrying out elaborate studies at the early stages of the programme. Wood and Wood (1985) elaborate the stages involved in the design of conservation education programmes, applicable to environmental education programmes, detailed below.

Assessment of the Environmental Situation

The first task is to carry out an assessment or appraisal of the environmental situation. This means identifying and assessing the various components of the biophysical environment and the various human activities that are likely to have an impact on them, positively or negatively. By extension, it involves an identification of the prevalent environmental problems, the causes of the problems, and the potential solutions.

Identification of the Target Audiences

A target audience can be described as a group of individuals who, directly or indirectly, are affected by or contribute to the identified problems, or who could be instrumental in the implementation of possible solutions. These could be men, women and youth; farmers, hunters, fishers and harvesters of forest products, or community institutions such as the Village Traditional Council, Women's Group and Youth Association.

It is necessary to understand the role and level of influence of each of the target audiences in the community, how they interact with each other, and their perception and level of awareness of environmental problems. Assessing the level of education within each target audience will also be useful in determining how best to deal with its members. It is equally necessary to understand the community's methods of communication, including both language and local idioms, and how each target audience reacts to new ideas or innovations.

Formulation of a Working Strategy

Most programmes fail. This is due largely to unrealistic and ill-defined working strategies, which help illuminate the way towards the right decisions, the right directions and the right paths.

Box 9.2: Framework for Developing an Environmental Education

Awareness/Knowledge

- programme and/or activity goals and objectives clearly defined and stated
- benefits of activity to communities clearly demonstrated and/or articulated
- environmental, health and other relevant issues adequately covered
- (these should include both general and specific ones).

Skills

- good communication skills promoted amongst staff and with and among communities
- simple analytical skills developed in community members (e.g. to analyse environmental problems and issues also in a more scientific way)
- practical activities which are culturally acceptable, intellectually, physically and socio-economically rewarding to communities and gender sensitive.

Implementation Tools

- communication tools for awareness raising and sensitisation
- cost-effective, attractive and culturally acceptable mass media tools, which are
- intellectually and socially meaningful, rewarding to communities and gender sensitive
- identification of key target groups
- identification of potential collaborators and areas of collaboration
- inter-personal communication tools that are culturally acceptable intellectually and socially meaningful and rewarding to communities and gender sensitive.

Mechanisms

- mechanism(s) for ensuring regular activities in communities
- activity sustainability mechanisms that include both short and long term dimensions
- mechanism(s) for targeting various categories of communities (e.g. receptive/non-receptive ones, those with schools and those without, those with roads and those without)
- mechanism(s) for exploiting/minimising prevailing/emerging opportunities/threats which could mean encouraging internal and external collaboration, avoiding duplication of efforts, guaranteeing the removal of potential obstacles to activity implementation, acquiring additional information, knowledge and skills, and securing additional material and/or financial support)
- mechanism(s) for monitoring and evaluation (e.g. regular feedback from selected community groups).

Source: Inyang 2007.

A strategy could be defined as a concrete plan of 'what', 'how', 'with whom', and 'when'. Action should be geared towards the intended goal. It clearly defines the goal and objectives of the programme, the target audiences and appropriate methods to be employed. It therefore means that before formulating the working strategy, the goal, objectives and methods need to be properly defined. A proper definition should not be formulated only in terms of wording, but also by linking between the catego-

ries. It should be clear how the methods, together with the activities on which they are built, contribute to the achievement of the objectives, and how the objectives, in turn, lead to the goals.

Other important elements are those that guarantee the sustainability of the programme. It has been generally observed that many environmental education activities fail due to a lack of mechanisms, also of sustainability. In a consultancy assignment for WWF-Coastal Forests Programme in Cameroon, Inyang (2007) developed a generic framework for the formulation of an effective environment education strategy. An important feature of the framework is a number of mechanisms for programme sustainability (Box 8.2). This framework was used in workshop settings to formulate environmental education strategies for four different projects, with obvious positive results.

Formulation of Environmental Messages

This is a very important, but perhaps the most difficult, task of the environmental education. Each target audience needs specific environmental messages communicated in particular ways, using appropriate media in particular situations in order to make the programme meaningful and effective.

Some messages may be used to address the entire village community or the Village Traditional Council, while others could be aimed at specific target audiences, like hunters, fishers, farmers and harvesters of non-timber forest products. Addressing a well-tailored environmental message to a wrong target audience may either render it ineffective, which is simply a wasted effort, or generate a bitter reaction from the audience. For example, giving a sensitive message on hunting intended for community decision-makers directly to a group of hunters may provoke their antagonism.

Ngome (1992) points out that the most fundamental question concern the kinds of things people should be told to make them realise that there is a serious problem, and that they will have to contribute to a solution. The core message to bring about awareness will be somewhat different from the message that is meant to bring about action. Even when people finally realise that there is a problem, it is usually difficult for them to accept responsibility for that problem. To avoid negative reactions, it may be practical to down-play their contribution to the problem and highlight the importance of their contribution to a solution.

By the same token, in formulating an environmental message, as much as possible, the positive should always be highlighted. This may seem difficult at first, as the easiest way, in most cases, is to employ the word 'don't'. But it can be effective to minimise using the 'don't' word. The target audience should be left to make its own decision about whether or not to continue with an environmentally unfriendly activity. In other words, the word 'don't' should be allowed to come from its members. There is increasingly common experience that once members of a target audience feel that a decision has been imposed on them, they will not implement it. Instead, it

may raise suspicion, unless they are sufficiently convinced that implementing it is in their own best interests.

Communication of Environmental Messages

Communication is an extremely important process in environmental education, especially if the effort is to ultimately influence a desired change in behaviour. Adzeyuf [undated] defines communication simply as the process by which one or more people are engaged in the exchange of ideas, knowledge, facts, feelings and impressions in such a way that the receiver can gain a clear understanding of the message and its intention. Seiler and Beall (2002) define communication as the simultaneous sharing and creating of meaning through human symbolic action. The latter definition stresses the importance of meaning: for what is a message without a shared meaning?

Messages are sent and received through channels. Horn and Rogers (1975) define a communication channel as the means by which a message gets from the source to the receiver. The most effective strategy to inculcate environmental education into the social system – school or local community – is to combine mass and interpersonal communication channels, as their combined effect is greater than that of either used separately (Chaffee 1972; Rogers and Shoemaker 1971; Rogers 1973). While mass media – radio, television, newspapers – are the most effective in increasing levels of awareness and general knowledge about environmental issues, interpersonal channels are most effective in convincing people to change what they actually do in practice (Horn and Rogers 1975). The purpose of communication, therefore, is to bring about social change, which Rogers and Shoemaker (1971) define as a process by which alteration occurs in the structure and functioning of a social system. They suggest three sequential stages in the change process: invention: creation or development of new ideas; diffusion: communication of new ideas to members of a given social system; and consequences: changes that occur as a result of the adoption or rejection of the innovation.

In any social system, the members are linked together and influence one another to produce a diffuse effect. A diffuse effect is like a chain reaction. It is the cumulative increase in the degree of influence upon an individual to adopt or reject an innovation, as a result of the increasing rate of knowledge and adoption, or rejection, of the innovation in the system. Once the adoption rate starts to increase, the social climate encourages others to 'get on the bandwagon'. It is important to note that the pace at which an innovation is diffused is a function of its complexity, conspicuousness, compatibility with existing practice, and the existence of appropriate media of communication (Ritson 1977). The more complex, less conspicuous or less compatible with existing practice an innovation is, the slower its diffusion rate, and the other way round. Cunningham et al. (2003) take this further, and give an elaborate presentation of the interactions, not only the social, cultural and linguistic factors that influence change in the society, but also the physical and external factors, such as worldview and influence of change agents, that play extremely significant roles to effect the change.

Communication is also influenced by the degree of 'homophily', or similarity, between the source of the message and the receiver. Homophily is defined by a sharing of important attributes that enhance the effectiveness of communication. Such attributes may be expressed broadly as lifestyles, beliefs, philosophies or idioms, all of which affect the encoding and decoding of messages. Coding refers to the manner in which a sender chooses to word and express a message. Decoding denotes the manner in which the receiver interprets the message (Buchanan and Huczynski 1991). The products of these twin processes are defined by 'perceptual filters', coloured by the context and setting in which the communication takes place, and refined by the relationship and mode of transmission between the sender and the receiver. In other words, these factors affect what people express outwardly and hold back, what they hear and do not hear, and the meaning they assign to what they hear.

Education for Sustainability

So far, we have gathered a substantial amount of information on the subject of environmental education. One of the conclusions from the knowledge gained is that the importance of this subject is increasingly enhanced by its role, both a prerequisite and a tool for sustainable development (Schneider and Weekes-Vagliani 1993). Its broad scope includes but is not limited to ecological and economic considerations. It is well known that as society strives to achieve economic development, through the use of environmental and other resources, ecological processes and life-support systems are often negatively affected. Negative effects on ecological processes and life-support systems are known to have serious consequences for the economic system and climate. Based on this realisation, there is now more and more emphasis on striking a balance between economic development and environmental protection; hence the concept of sustainable development.

The link between environmental education and sustainable development has been demonstrated by authors such as Huckle. In his 'Environmental education and sustainability: a view from critical theory', which appears as a chapter in Fien's book *Environmental Education: A Pathway to Sustainability*, published in 1993, he elaborates, on the discourses of 'education for environmental management and control' and 'education for sustainability'. The concept of education for sustainability has continued to grow in prominence. This is due, particularly, to its strong appeal emanating from its obvious focus on sustainable development. This can be discerned from its name, which soon made it gain wider acceptability as an alternative form of environmental education. It should, however, be noted that education for sustainability is a re-orientation of environmental education towards sustainable development considerations.

Therefore, while environmental education takes a holistic approach and maintains a balance between all the considerations, education for sustainability tends to lay more emphasis on sustainable development.

Conclusion

This chapter has established the fact that although environmental education is a relatively new subject in Africa, the concepts and efforts that eventually brought about its development into a full academic discipline have come a long way. It grew from warnings by concerned and foresighted individuals about the possible consequences of environmentally unsustainable activities perpetrated by humans, and developed into conservation and educational movements in the US in the 1930s.

The conservation movements focused on legislative and practical measures to safeguard nature and its resources; while the educational movements concentrated on the development of human knowledge about nature, through well designed studies. The latter movements have similarities with initiatives in the UK in the 1940s. However, the need for environmental education became more urgent in the 1960s due to the increasing evidence of the rapid degradation of the environment. Two international conferences were held, in 1972 and 1975 respectively. These helped formulate the definition and internationalisation of environmental education.

The efficacy of an environmental education programme lies in its inclusion of both short-term and long-term dimensions, meaning implementing both non-formal and formal aspects of the subject. We are advised of the necessity to ensure that the programme should, as much as possible, reflect local realities, colour and flavour.

It should be noted that implementing an environmental education programme requires, from the outset, an assessment of the environmental situation, an identification of the target audience and formulation of the working strategy. This is followed by a consideration of a range of factors that inform the formulation and communication of environmental messages. This chapter has also defined the meaning, scope and forms of environmental education.

Revision Questions

1. What important movements have given birth to what has come to be known as environmental education?
2. Discuss the role played by Aldo Leopold in the development of environmental education?
3. Discuss the factors that brought about the internationalisation of environmental education.
4. Define environmental education and state its objectives.
5. With illustrative examples, describe the three forms of environmental education.
6. Distinguish between awareness raising and sensitisation.
7. Discuss the four key prerequisites of environmental education.

Critical Thinking Questions

1. The scope of environmental education is more or less defined by the site and the available resources. Discuss.

2. In order to formulate appropriate strategies for changing or modifying the general attitude of a particular group of people towards the environment, a historical journey in time and space may be required. Discuss.
3. The more complex, less conspicuous or less compatible with existing practices an innovation is, the slower its diffusion rate. Elaborate on this within the context of a named environmental education activity.
4. The efficacy of an environmental education programme lies in its inclusion of both short-term and long-term dimensions. Discuss.
5. Discuss the extent to which environmental education merits the description of education for sustainability.

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