CHAPTER I
INTRODUCTION
Though Man is a product of Mother Nature, yet after living in perfect harmony with nature for centuries and centuries, he has created a situation of persistent conflict with Nature, which unfortunately, is now leading to as grave a situation as self-destruction with the advent of modern science and technology. The world has not only shrunk but also become highly interdependent. The three, Mile Island, Chernobyl and Bhopal may be located in three, different parts of the globe, but the tragedy that struck these places affected seriously the whole ecology of the earth. Environment is thus becoming global in nature and the subtle linkages are now being discovered. Deforestation in Nepal is linked to floods in India, emissions from Great Britain are causing acid rains in Scandinavian countries, consumption of hamburgers in the United States are linked to forest depletion in Latin America as most of forest area is cleared for raising piggery.(Bala, 1996)

**1–1 ENVIRONMENT: MEANING AND CONCEPT**

The term 'environment' is viewed differently by different subject experts and environmentalists. According to "Webster" it is the aggregate of all the external conditions and influences affecting the life and development of an organism or group of organisms.

Some people think that environment is the sum total of all conditions and influences that affect the development and life of organisms. In simple words environment may be all those which are physical and chemical, organic and non-organic components of the atmosphere.

All the constituents of environment are interdependent and maintain balance in nature. At one time the environment meant only health and sanitary engineering but today it is all pervading and involves all basic science and engineering disciplines as also socio-economics. It literally means "what surrounds".

The surrounding may be considered as the aggregate of all social, biological, physical and cultural factors which affects the life and development of an organism. It consists of both organic and inorganic elements. These constituents generally fall into two categories.

i) **Natural Environment:** All constituents of natural origin like physiography, climate, vegetation, soil, water bodies, wild animals and minerals.
ii) Human Environment: All elements having a human touch in their origin such elements include all manifestation of human activities. Therefore, the word "Environment" best conveys the idea of man’s behaving with and reacting against the field of forces that nature provides. According to John Rau (1980), the environment includes following dimensions, which are further categorized into the sub-categories.

1. **Physical Environment**
   1.1 Land and climate, soil, topography, climatic conditions, flood, earthquake, irrigation.
   1.2 Vegetation, forest, wild life, breed areas.
   1.3 Physical character of area population density, industrial and commercial footage, building height design.
   1.4 Infrastructure, water supply sources, sanitary sewage, sewers, drainage, energy sources, and transportation facilities.
   1.5 Air pollution, noise pollution, water pollution and their sources, remedies.
   1.6 Atomic pollution, atomic pollutant, their effect on human body, fauna and flora, atomic reactor, remedies and control.

2. **Social Environment**
   2.1 Community facilities and services, location and capacity of schools, police, fire, health and social service facilities, employment centres and commercial facilities.
   2.2 Character of community socio-economic and social characteristics, community life places to meet, management, organized activities.

3. **Economic Environment**
   Employment and unemployment levels, level and source of income, land ownership and land values.

4. **Aesthetic Environment**
   4.1 Existence of site-historic, archaeological.
   4.2 Scene areas, views, natural land scope
   4.3 Disturbance of aesthetic environment due to pollution, remedies.
5. Cultural Environment
Religious, caste systems, traditions and social customs, explosion of pollution, quality of life.

Trivedi (1994) in his study indicates that the components of environment can be categorised under following headings:

1. Physical components: Water, air, land, minerals and fossil fuels, tidal processes, chemical and geological processes etc.

2. Biological components: Animal, wild life, vegetation, flora, food Chains and specific ecosystem etc.

3. Man-made components: Towns, roads, fields, urban infrastructure, transport and communication system, agricultural economy etc.

4. Social components: Social groups, political groups, cultural groups, social and political structure, legal structure etc.

Environment refers to the sum total of the all conditions and influences that affect the life and development of organisms. The human environment is the earth we live on. It includes all the physical parts of the earth, such as air, soil, minerals, rocks, and water and all its living organisms, such as animals and plants. Therefore, there is no denying the fact that it is the primary responsibility of man not only to preserve the environment, but also to improve it qualitatively. However, the contemporary environmental scenario presents a picture of dismay and gloom. The intensive application of science and technology combined with man's greed to over exploit the natural resources, the unprecedented rapid population changes in human life style, have in their wake brought serious environmental problems. These environmental problems are matters of common concern. The very survival of man depends on the solution of these problems.

The concept 'environment' can, best be understood as the totality of all components surrounding the man. The Environment Pollution Panel of the United States President's Science Advisory Committee (1965) referred to the environment as "the sum of all social, biological and physical or chemical factors, which compose the surroundings of man". Each component of these surrounding constitutes a resource on which man draws
with a view of promoting human welfare. Unlike all other forms of life, man is capable of exerting great influence upon the environment which in turn affects almost all the life processes and form of organisms. The way in which we organise, harness and administer or manage this potential depends to a great extent upon the kind of planning the country has evolved. This is a great challenge to the environment administration.

The fact that the environment is used to cover every activity of man makes it difficult to develop a practical yet comprehensive definition of 'environment'. To begin with it is beyond the capability of any environment administrator to master the detailed functioning of each of the components of the environment. Environment pollution, depletion of resources and the socio-economic infrastructure, human population and cultural heritage constitute vast technical areas and are best left to the specialist concerned with them in isolation. The job of the administrator and manager is merely to study and exercise control over the process by which these factors interact with one another and the manner in which they finally contribute to his particular goals. Edmund and Letey (1973) define environment administration as a concept of "managing human affairs in such a way that biological health, diversity and ecological balance will be preserved". Environment administration is the process of carrying out activities which are concerned with protection and enhancement of the quality of the environment.

The man environment relationship makes a fascinating study. The man environment relationship is never constant and many are the factors, which are responsible for shifts in this relationship. This results in environmental changes on the one hand and changes in the structure, as well as the genetic and socio-cultural characteristics of population on the other hand. This adaptation to environment takes different forms and involves different reactions.

Apart from genetic and biological responses to different environmental conditions, man as a cultural animal has, with the use of technology, manipulated the environment in order to satisfy his desires and
needs. Man's interactions with his environment have been undergoing change and adoption continuously in many parts of the world.

Environment is the dynamic, complex and interconnected system in which any action in one part affects the other. Air, water, soil, land, plants, and animals are the different components of environment. These components maintain a mutual balance known as "ecological balance" in nature.

Environment is what surrounds us. It includes widely divergent habitats, man, the different plants and various animals, which live together in them, as well as the atmosphere which all share in common. When disturbance occurs in the environment, the condition affects all its members.

There are different factors that disturb the environment. One category is natural agencies, such as fire, floods, drought, famine, diseases, electrical disturbance, earthquake, volcanic eruption, climate change, compound disturbance, cosmic events, and so on. The other category is man.

The environment is a set of natural conditions in particular place. The word "environment" strictly meaning the physical surroundings influencing development of a segment of the earth, when one component or attribute of the set of natural conditions is affected, the total chain will be disturbed.

Environment is the natural house and donor of all life bearing components. Its quality has great impact on the survival of mankind, which is in danger due to over population and economical and technical exploitation of natural resources. Some educational activities including non-formal systems are the basic requirements for conserving natural resources. The regional adults and children must be educated and trained for understanding and conserving the environment. Thus, any of the environmental problem should not be considered as regional but as national. Therefore, a proper, utilitarian and result oriented education in conservation is essential and urgent need of today's educational system for the survival of human beings. The role of education in environmental conservation, in order to be enveloped by a healthy environment we must educate the young of today, who are the potential doctors, engineers, scientists, technicians, and educationists. They must awaken their ego to realise the importance of
conserving their environment so that they can take up the desired step to reap the fruitful harvest in future and yet live healthily. They must utilise the fast developing technologies of today, which are being designed to control pollution and yet remain profitable.

1–2 ENVIRONMENTAL EDUCATION

‘Environmental Education’ is the process of recognizing values and classifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. It also entails practice in decision making and self-formulating of a code of behaviour about issues concerning environmental quality.

Environmental Education is an integrated process which deals with man's interrelationship with his natural and man-made surroundings, including the relation of population growth, pollution, resource allocation and depletion, conservation, technology for urban and rural planning to the human environment. Environmental Education is a study of factors influencing ecosystem, mental and physical growth, living and working condition, decaying cities and population pressures.

The goal of environmental education is to develop a world population that is aware of, and concerned about, the environment and its associated problems, and which has the knowledge, skills, attitudes, motivations and commencement to work individual and collectively toward solutions of current problems and the prevention of new ones.

1–2.1 Environmental Education (EE): Meaning and Concept:

Defining Environmental Education (EE) is a difficult task. Being a new area of instruction and study it evades an acceptable definition and avoids sharp clarification.

Environmental Education is defined as the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his bio-physical surroundings. It also entails practice in decision-making and self-formulation of a code of behaviour about problems and issues concerning environmental quality (UNESCO, 1970).
Mares cherry (1985) is of the view that environmental problems over a period of time give rise to a more responsible citizenry which in turn means greater responsibility towards environment protection leading to a more healthy environment. Environmental education as such goes beyond mere acquisition of information about environment. It implies acquiring attitudes and values conducive to environment protection and an understanding of inter-dependence of nature and people. Environmental education is a continuous process, starting from early childhood and going on throughout adult life aimed at creating an environmentally responsible society with an understanding of how attitudes and values can affect the environment as at present and as well in the future. This can be achieved only by taking learning outside the classroom and into the community so that the students see for themselves the relevance of this education in terms of the existing societal realities and not in terms of grades in an examination.

Environmental education has now emerged as a new filed of study, instruction and research with the following commonly agreed characteristics:

1. Environmental education should be integrated into the whole system of formal education at all levels;
2. Environmental education should be inter-disciplinary in nature;
3. Environmental education should adopt a holistic perspective, which will examine the ecological, social, cultural, and other aspects of particular, problems;
4. Environmental education should be centered on practical problems related to real-life; and
5. Environmental education should aim at building up sense of values.

The environment and education are interrelated to each other. The interaction between these two can be described as under:

a) Education inculcates in the young minds, the basic principles of sanitation and hygiene.
b) Education creates the urge for a clean environment.
c) It helps pupils to appreciate the need for conservations of our multiplicated heritage.
d) It teaches newer and environmentally safe techniques.
There are widely differing concepts of what environmental education is or should be. Environmental education is a pragmatic response to the defacement of the environment. It is a kind of education which will seek to make pupils fully aware of the problems connected with their environment so that they will be able to tackle these problems with a sense of responsibility and with the technical skills which will enable them to contribute to their solutions along with other members of their community. This awareness of environmental problems is social awareness. Such problems will be solved through collective action aimed at eradicating the social and economic causes of degradation of human environment.

Environmental education includes not only conservation, outdoor and natural resource education as well as nature study but it also includes everything that relates to man and his environment. It is the study of man and the manner in which he shapes his total natural and culture surroundings for good or ill. Man, not his technology, not the physical or biological worlds as a separate entity, not the arts or professions operating in segregated spheres, but all of these as they affect the quality of human life, becomes the pivotal concern. Man can not be separated from the earth's ecosystem for he is the only conscious manipulator of the environment and his manipulation must be directed towards enhancing the quality of environment.

Environmental education is the study of the factors influencing ecosystem, mental and physical growth, living and working conditions, decaying cities and population pressures. Environmental education is intended to promote among citizens the awareness and understanding of the environment, our relationship to it, and the concern and responsible action necessary to assure our survival and to improve the quality of life.

Environmental education is oriented towards the development of values that are translated into action, awareness, appreciation and understanding of the environment are only first steps and do not necessarily lead to action. Each student must acquire an environmental ethic, a concern for and moral commitment responsibility to the environment. Further, he should have the motivation and the competence to make
decisions. His ethic must guide him both in living with the earth’s resources and other species and in living with his fellowmen in social, political and economic relationships.

Environmental education aims at the knowledge, desires and ability necessary to direct one’s conduct towards improving the quality of life. It enables the individual to perceive the problems that exist and to devise solutions to them. In order to develop in the students an environmental ethic, they throw off their arrogance and perceive with humility their place in the earth’s eco–system and their ability to manipulate the environment. In short, the environmental ethic provides students a new rationale for their existence, or all the technology and power will not sustain their existence.

The first international working meeting on environmental education in the school curriculum at Forest Institute in the Summer of 1970 defined environmental education as the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man and his culture and his biophysical surroundings.

The child from very beginning of his education must be indulged in field work so as to collect the data related to environmental problems. This will make him to understand the underlying currents in environment and to watch out the relationship between different components. Therefore, environmental education:

1. Is life long process and begin at pre-school level upto all formal and informal stage;
2. Emphasizes active participation in preventing environmental problems and working towards their solutions;
3. Enables the learners to play a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences.
4. Focuses on current environmental situation.
5. Explicitly consider environmental aspects while planning development and growth.
6. Promote interrelationship of people and environment.
7. Emphasizes the complexity of environmental problems and need to develop the critical thinking and problem solving skills.
8. Utilizes diverse learning environment and a broad array of educational approaches to teaching-learning about and from environment with the stress upon practical activities and first hand experiences.

1–2.2 Environmental Education: Historical Perspective

A number of environmental and ecological disasters that occurred in 50's and 60's attracted public attention to take some concerted steps to solve the problems of increasing environmental pollution. The smog episodes in London during 1950's and 1960's, the mercury poisoning in Minamata, Japan between 1953 and 1965, and the ecological damage caused in U.S.A. by the use of DDT and other organochlorine pesticides were some of the more serious environmental incidents, which focused public attention on the environment. Although the United Nations Conference of Human Environment held in Stockholm in 1972 is generally considered the first concerted international attempt to address global environmental problems, some international organizations such as UNESCO, FAO, WHO, WMO, (World Meteorological Organization) and some non-UN bodies such as Organization for Economic Cooperation and Development (OECD), Council for Mutual Economic Assistance (CMEA), and Council of Europe had been involved in studying environmental problems for several years. The early international programmes such as International Geographical Year of 1957 and 1958, the Scientific Committee on Antarctic Research and the International Biological Programme gave impetus to environmental status in general and helped popularize environmental issues, especially in the developed countries like USA, USSR now Russia and Western Europe.

The Stockholm Conference provided a forum and a focus for the major problems of the human environment; pollution, environmental health and the need for promoting awareness of the environmental issues. It pointed out that the world was facing a problem of incalculable and often irreversible harm that man had inflicted on the natural environment.
In response to the historic developments of the early 1970s and the growing need to grapple with the network of problems underlying environment, resources, population and development, a series of international conferences were held by the United Nations subsequent to the Stockholm Conference on Human Environment. Some of these are: The United Nations World Population Conference (August 1974); The World Food Conference (November 1974); the Second General Conference of the United Nations Industrial Development Organization (March 1975); The United Nations Conference on Human Settlements (June 1976); The United Nations Water Conference (March 1977); The United Nations Conference on Desertification (September 1977); The United Nations Conference on Science Technology for Development (August 1979); the United Nations Conference on New and Renewable Sources of Energy (August 1981) and the World Population Conference (August 1984).

The Stockholm Conference on Human Environment in 1972, produced an action plan for human environment and resulted in the establishment of United Nations Environmental Programmes (UNEP) which, together with UNESCO, launched the International Environmental Education Programme (IEEP). IEEP organized an International Workshop on Environmental Education in Belgrade in October 1975. The results of the deliberation of this workshop are contained in a document-the Belgrade Charter-which spell out a framework and statement of objectives and guiding principles for environmental education. The Belgrade workshop was followed by a series of regional meeting held in Brazzaville for Africa, Bangkok for Asia, Kuwait for Arab States, Bogota for Latin America and the Caribbean, and Helsinki for Europe. The Asian Regional Meeting which was held in Bangkok in November 1976 resulted in formulation of 15 recommendations under the four problem areas: (i) programmes for environmental education; (ii) personnel training; (iii) non-formal environmental education and; (iv) materials for environmental education.

The regional meetings were followed by the Inter-governmental Conference on Environmental Education, which was held in Tbilisi, Georgia, in October 1977. The meeting marked the culmination of the first phase of
the environmental education programme. Attended by representatives from 66 Member States of UNESCO, the Conference was highly significant in the development of environmental education. Following the Tbilisi Conference, the Member States reacted positively by undertaking the development of environmental education and by introducing legislation to protect the social and physical environment. As a follow-up to the Tbilisi Conference, a Regional Workshop on Environmental Education was held in Bangkok in September 1980. This workshop was attended by 19 participants from 17 Member States and made specific recommendations for implementing environmental education programmes in the Asian region.

In 1981/1982 the joint UNESCO/UNEP International Environmental Education Programme (IEEP) conducted a survey to determine the present needs and priorities of Member States in relation to environmental education and training and the main trends in its development, particularly since the 1977 Tbilisi Conference.

This survey showed that in the Asian region the most pressing needs in environmental education are felt in general primary education, secondary education; teacher training; university education; technical and vocational education; adult education; and rural education. The most marked shortcomings in this respect are related to appropriate teaching materials, the number of teachers qualified to deal with curricula in this field, curricula in the field of environmental education and research and experimentation. A very high level of priority was accorded to the training of teachers in the field of: environmental education; university education; technical and vocational education; and general secondary education. A considerable level of priority was also accorded to adult education, moral education and general primary education. High priority was also attributed to the conservation of resources; pollution and nuisances; nutrition and health; urban environment; and the problem of natural disasters.

1–2.3 Environmental Education In Southeast Asian Countries

The Southeast Asian countries or the Association of South East Asian Nation (ASEAN) is a regional organization comprising of Indonesia, Malaysia, the Philippines, Singapore and Thailand. It is the outcome of
Bangkok Declaration which was signed by the Foreign Ministers of ASEAN countries on 8th August, 1967. Brunei Darussalam joined the Association in 1984, Vietnam in 1995, Lao P.D.R. and Myanmar in 1997, and recently Cambodia in 1999. Its aim is to accelerate economic progress and maintain the economic stability of southeast Asia. Each ASEAN capital has an ASEAN national secretariat. The central secretariat for ASEAN is located in Jakarta, (Indonesia) and is headed by the Secretary General, a post that revolves among the member states in alphabetical order after every 3 years. Bureau directors and other officers of the ASEAN Secretariat remain in office for 3 years.

The environmental damage in one country may also have impact on other countries and thus it will affect the world at large. No single action could unilaterally deal effectively with the issue. Thus, environmental issues truly demands international cooperation to rectify the damage. ASEAN has not failed to recognize the significance of environmental issues, the pursuit of economic growth and development. Realizing the need to protect and manage the environment for a good quality of life for the people, significant progress in environmental cooperation have been made among ASEAN member countries.

The progresses made show that ASEAN member countries have the determination and will to carry out the pledges to save the environment so that future generations is able to enjoy sustainable growth and development. Apart from promoting awareness and broadening the participatory process in the environment, ASEAN Environment Year (AEY) is also a celebration of ASEAN's achievements in environmental cooperation as well as achievements made by individual ASEAN member countries in the field of environmental protection and management. For this reason various regional and national activities have been organized by all ASEAN member countries.

The main objectives of the ASEAN Environment Year (AEY) are:
1. To highlight ASEAN environmental issues and cooperative programmes in order to stimulate awareness on these issues among the ASEAN populace.
2. To broaden the participatory process in the area of the environment in ASEAN.

3. To stimulate regional activities in the environment area.

The ASEAN, in pursuance of the initiatives made by its various committees—the Committee on Science and Technology (COST), the Committee on Social Development (COSD), and the Chamber of Commerce and Industry (CCI), among others—is now surging toward economic growth, technological progress, and industrial development in efforts to eradicate poverty, raise the level and quality of education, and prevent the exploitation and domination of one group of people by another, or of one nation by another nation. This growth and development is not without environmental cost. Signs of this stress are already evident in the form of: deforestation, shortages of certain natural resources such as water and energy, crowding in urban area and increasing incidence of environmentally caused health problems. The answer to these rising problems is environmental management by way of conservation and sustainable development.

Environmental education is one potent environmental management strategy. There is no better time than now to build the framework of a truly ASEAN environmental education programme that will develop in each member nation the competence to manage its own environment for its own optimal development without losing sight of its own socio-cultural and religious heritage, yet looking forward to cooperation, mutual trust, and harmonious relationships with other member nations.

It is envisioned that the ASEAN EE programme will develop in the people of the region a sensitivity and concern for the environment, foster environmental values and attitudes, generate knowledge and better understanding of environmental phenomena, develop skills in solving environmental problems, and spur people to action that will enhance the quality of life for the present and future generations.

The goals of ASEAN cooperation in EE are enumerated as under:

1. To formulate an ASEAN Environmental Education programme that will develop in the region's populace an understanding of environmental
phenomena and processes, skills and values needed to ensure an ecologically harmonious, sustainable development and productivity of the environment.

2. To share new scientific and technological knowledge to enhance the quality of the environment in the ASEAN region.

3. To exchange new educational approaches, techniques, and teaching devices appropriate to environmental education in order to advance the frontiers of environmental education in the ASEAN region.

In addition to broader goals, the specific objectives of the programmes for the students are to:

1. Acquire basic understanding of the interrelationships of components and factors of the environment and the processes that occur in it.

2. Develop desirable values and attitudes, especially concern and responsibility toward the conservation and enhancement of the environment.

3. Acquire and refine skills in identifying, assessing, and solving environmental problems.

4. Develop a sense of urgency in responding to environmental issues and problems and taking action toward their solution.

To understand the views towards the environmental education in the Southeast Asian countries context; a discussion about the environmental education programmes in Indonesia, Malaysia, Philippines, Singapore, Brunei, Vietnam, Lao. P.D.R, Myanmar, and Cambodia is presented briefly as under:

1–2.3(i) Republic of Indonesia

The Republic of Indonesia covers most of the world's largest archipelago, a domain of over 3000 equatorial islands stretching more than 5000 kilometres east to west across the seas that separate continental Southeast Asia from Australia. It covers an area of 1,904,569 square kilometres and it is the world's fifth most populous nation, with approximately 206.5 million people in 1998. Formerly the Dutch East Indies, the Republic of Indonesia is an archipelago state consisting of about 13,500 (6000 inhabited) islands extending some 5150 kilometres along the Equator in the
Indian and Pacific Oceans. The largest islands of the archipelago are Sumatra, Java, Kalimantan (Indonesian Borneo), Sulavesi and Irian Jaya. The islands were made an integral part of the Netherlands Kingdom in 1922. During World War II, Indonesia was under Japanese military occupation. On August 17, 1945, Indonesia proclaimed independence from the Dutch.

One of the world's richest countries in natural resources, Indonesia has vast supplies of tin, oil and fairly big deposits of bauxite, copper, nickel, gold and silver. Agriculture is the main occupation of the people. Crops include rice, tobacco, coffee, rubber, casava, maize, pepper, kapok, coconut, palm oil, tea and sugarcane. Forest products are a major source of foreign exchange. Food processing, textiles, paper, cement, automobile and cycle assembly works and chemical factories have also been developed. With a foreign debt in excess of $100 billion, Indonesia is one of the largest debtor countries of the world.

For creating awareness among people about environmental issues, a series of programmes on environmental education have been developed in Indonesia. The long-term objective of these programmes is to ensure that the young generation is prepared and equipped with the knowledge of the environment, and motivated to participate in maintaining the human environment.

Since the establishment of the Indonesian National Committee for the Man and the Biosphere (MAB) Programme in 1975, current activities in environmental education include co-ordination of formal and non-formal education. A working group was first established for each type of education. Each of the working group was asked to study the existing curricula and identify the appropriate situations for introducing environmental education, determine the best methods of teaching from the standpoint of both students and teachers, develop educational modules, organize training for teachers, and implement the modules produced in selected primary schools in Jakarta on an experimental basis.

In view of the heavy load already imposed by the curriculum, the introduction of a new subject area like environmental education in the formal
programme was avoided. It was concluded that it is not necessary to introduce it as a new discipline. The aims of environmental education are to be achieved by giving due emphasis—or indicating the environmental relevance—in the several subject areas required by the existing curriculum. Several subject areas were involved where environmental education could be conveniently grafted. These include Religion, ’Pancasila’ (Morality), Physical Training and Health, Social Sciences and above all Natural Sciences. For this purpose two educational modules were developed, for teachers and students.

At present, the environmental education at primary education level is integrated with Natural and Social Science. (UNESCO pilot project in municipal schools in Jakarta-leads to integrated approach to environmental education), at secondary education level it is integrated with Science, Biology, Social Science, Geography, ’Pancasila’ (Morality), and economics, and at the tertiary level in some universities it is the part of population education course in pre-service teacher training compulsory course on environmental studies. It is also offered as separate courses in Secondary Teacher Training Institutions.

To implement environmental education, a series of meetings and consultations are undertaken with various institutions. Moreover, the local population around the school community are informed of this plan so that their assistance could be solicited. There are five phases in the implementation:

**Phase one (Preparation)**
- Consultation with the principals of the local community, the headmasters, other teachers of the same schools, school supervisors and others.
- Preparation and distribution of audio-visual aids and posters.
- Preparation of locally-specific subject matter/modules for children by the respective trained school teachers.

**Phase two:** Simultaneous execution of environmental education in the five schools selected.
Phase three: Mid-term evaluation, after two months of operation of the programme, a mid-term evaluation is undertaken, to find out whether or not the modules met the requirements; what its shortcomings are and how to improve them.

Phase four: Final evaluation, the academic records of each pupil participating are studied; their involvement and activities in group actions are expected to be physically visible in the school community, and the opinions of the local community are solicited.

Phase five:
- Preparation of evaluative reports accumulated during a workshop to evaluate the performance of the pilot project as a whole.
- Preparation of a five-year plan for environmental education.

Monitoring and evaluation on the progress of the experiment are continuously undertaken. On the whole it can be concluded that the positive effect of environmental education is evident in both the understanding and the knowledge of school children as well as their attitude towards the environment and their activities outside the schools.

1–2.3(ii) Malaysia

Malaysia, at the southern end of the Malay Peninsula in southeast Asia, is a federation of 13 states comprising Johor, Kedah, Kelantan, Melacca, Negeri Sembilan, Pahang, Perak, Perlis, Pulau Pinang, Sabah, Sarawak, Selangor and Terengganu. Malaysia was created in 1963. It included Malaya, which had become independent in 1957, plus the formerly-British Singapore, Sabah and Sarawak, Singapore was separated in 1965. Malaysia covers an area of about 330,434 sq.km. and its population of approximately 21.5 million people in 1998. Malaysia has a multi-racial population. Of the total, 55 percent are Malays, 33.4 percent Chinese, 10.1 percent Indians and 1.4 percent others. Natural resources are abundant. Malaysia is one of the world's largest producers of rubber, tin and palm oil. Malaysia is also the world's leading exporter of pepper and timber. Other crops are rice, coconut, vegetables, pineapples, coffee, tea, cocoa, etc.

Iron ore, gold, ilmenite and bauxite are the major mineral resources. The petroleum industry in Malaysia is becoming significantly important to the
economy of the nation. Leading industries are food products, tobacco, wood products, electrical goods, textiles, chemical products, construction goods, non-metallic products, transport equipment and the processing of agricultural products from estates (e.g. rubber, palm oil). Industrialization has been speeded up with foreign investment.

In Malaysia, the curriculum development in environment education is no longer merely subject-based, but has a much wider application.

Environmental education, by its very nature, draws its content from several disciplines and hence an instructional programme development calls for an integrated, transdisciplinary approach based on the total environment which would promote an environmental consciousness in each individual. Within such a framework it is possible to further strengthen and consolidate environmental problems and issues as components of the science and social studies curriculum. The role of the teacher is to improve the students' perception of the environment by teaching through the exploration of the environment by teaching through the exploration of real-life problems and situations in the community, looking first at simple and then complex phenomena in both man–made and natural situations.

As there is no separate subject on environmental education in the formal school curriculum, the various subject disciplines of science and social studies at the different grade levels have environmental objectives in their respective syllabuses. This strategy has been adopted by the Population Education Project of the curriculum Development centre. Techniques for introducing environmental concepts into different subjects of the curriculum in Population Education are:

1. Infusion approach

   This approach generally has three stages.
   
a) Identification of relevant environment-related concepts and the points in subject disciplines at which these concepts can be infused;
   b) The selection and sequence of appropriate learning units;
   c) The preparation of textual and audio–visual materials for use by classroom teachers.
2. Integration

In this approach the relevant population topics are integrated into syllabuses as and when these are revised. The Population Education Project subscribes to the view that education helps to transmit knowledge and values and, in so doing, prepares they young to face the future. Education is becoming more and more concerned with the development of individuals as responsible and economically productive citizens. As such, education must inculcate in young citizens a sense of responsibility for the future and a commitment to the improvement of the environment.

The population Education Project as seen from an environmental point of view claims that students will be able to learn about how and why population changes occur and the effects these changes have on the quality of life of the people and the environment they live in. This is necessary to increase students' understanding of population-related issues such as employment, industrialization, urbanization, squatter settlements, pollution, housing, education, health services, and the supply of food, water and energy.

The Science Curriculum

First level

In the primary schools it has been suggested that in integrated approach be adopted involving the environment as the basis of the learning. In any given environment the starting point of study may be any object—simple or complex—a social event, a process or a problem about which the children may be naturally curious. The method of study would be through personal observation and involvement with the teacher acting as guide in helping to make the observations comprehensive and imaginative. The process of scientific inquiry would increase their understanding of live around them. The would be required to report what they have explored in order to learn the art of expression and discussion.

Second level

In the secondary schools, it has been recommended to pursue the scientific method in greater depth. The topic selected would be taught as a set of problems. This is a functional approach using the scientific method of
looking at complex phenomena involving man–made and natural situations; it calls for an understanding of inter–relationships in nature.

At the lower secondary stage the Integrated Science programme stress conceptual understanding. Implied in this is the application of acquired knowledge and skills to real–life situations. In the General Science, Physics, Chemistry and Biology syllabuses, the teaching and learning approaches are designed to improve the understanding of concepts and principles in science through supervised activities related to selected situations.

At present, the environmental education at the primary education level is integrated into the subject; man and his environments, at secondary education level is integrated into science and geography, man and nature, and at the tertiary education level is integrated to be infused with science and geography, part of pre- service and in- service training by training college and universities.

Interestingly, also in Malaysia, the ASEAN Youth Environmental Awareness camp is an educational and environmental awareness project under the Seventh National Development Plan. Under Agenda 21, a programme of action for sustain development agreed by World leaders, at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro, Brazil between 3-14 June, 1992 the involvement of youth is critical in environment and development decision making. It is necessary to enable youth from all parts of the world to get access to information. They are to be provided with opportunities to present perspectives in decision making to ensure a secure and healthy future, including an environment of quality, improved standards of living and also good education as well as employment.

The objectives of the ASEAN Youth Environmental Awareness camp are; (i) to promote environmental awareness and education among ASEAN youth. (ii) to promote skills development in environmental education (iii) to enhance the role and responsibilities of ASEAN youth for a safe and healthy environment. (iv) to encourage youth networking in sustainable
environmental activities. (v) to encourage exchange of information and knowledge among ASEAN youth.

The promotion of public environmental awareness in Malaysia, Sahabat Alam Malaysia (SAM) is a concerned citizen's group campaigning against the deterioration of the environment. Their topics range from the depletion of water and fish resources, indiscriminate felling of trees in forests and the extinction of wildlife to problems relating to soil erosion and pollution. SAM also conducts seminars, organized talks and exhibitions and has even initiated newspaper columns on environmental issues in the Malay, English and Chinese dailies, thus generating awareness and interest among the public. Also in Malaysia, the Consumers Association of Penang (CAP) publishes the monthly 'Utusan Konsumer' which carries a wealth of information on the environment for consumers. Their activities also include organizing exhibitions and talks and preparing news bulletins. However, there is much to be done on environmental education and awareness in Malaysia.

1–2.3(iii) Republic of the Philippines

The Philippines is an archipelago of about 7100 islands. The Republic of the Philippines lies in the Western Pacific Ocean, over 800 kilometres off the southeast coast of Asia with a total land area of 299,404 square kilometres and the population of Philippines, approximately 72.7 million people in 1998. The principal islands are Luzon in the north and Mindanao in the south. The Philippine islands, discovered by Magellan in 1521, were conquered by Spain in 1565. The islands, named for King Philip II of Spain, were ceded to the United States of America in 1898. Became completely independent in 1946.

Main agricultural crops of the Philippines, the home of the Green Revolution, are rice, maize, sugar, tobacco, coconut, pineapple and bananas. Manufacturing is a major source of economic development. Industries include textiles, rubber products, oil refinery, pharmaceuticals, chemicals, electronics assembly, furniture, cigarettes, paper, metal, glassware and food products. The Philippines is rich in natural resources and has iron, silver, gold, chromite, manganese and copper deposits in
commercial quantity. It has also marble quarries, forests and extensive fishing grounds. All natural resources belong to the state.

In the Philippines, the definition, scope and role of environmental education is a process of developing a citizenry that is knowledgeable about the natural world and man-made environments and about the ecological relationships between human beings and their environment; a citizenry that is skilled in inquiry, investigative techniques, critical thinking and decision-making, that is aware of environmental problems and is concerned about the protection and preservation of the environment.

Environmental education aims to develop in people a recognition of their responsibility to maintain the environment so that it is fit to live in:

In the Philippines, a conceptual scheme for environmental education includes the following five major schemes:

1. Living things are interdependent with one another and with their environment.
2. Organisms (or populations of organisms) are the product of their heredity and environment.
3. Organisms and environments are in constant change.
4. When matter changes from one form to another the amount of matter remains unchanged.
5. The economy of a region depends on the utilization of its resources and technology.

With these concepts as tools, teachers are to guide their students to discover what is in their surroundings, to place their discoveries in a perspective that will encourage awareness and imaginative problem-solving and develop an understanding of their relationships with the environment.

Learning sequences are given for grades, the language is simplified where necessary for the lower grades. It seeks to develop in the learner a healthy respect for and a stable relationship with his environment.

**Objectives of environmental education:**

**General:**

1. To educate the people in the prevention of pollution as a means of improving environmental quality.
2. To adopt practical measures in order to combat diseases and prevent deaths caused by pollution.

Specific:
1. To train a staff of teachers in environmental education,
2. To adopt practical strategies to control and prevent pollution of air, water and soil, and
3. To create a system for educating students and the community.

In primary school, the emphasis is on developing understanding which will contribute to the children's behaviour as trustees of the natural resources and as future decision-makers and participants in the development of the country. In secondary school, these teachings will be considered but there will be more stress on problem-solving activities.

In the Philippines, in the primary grades, environmental education concepts are integrated into existing subject areas. In lower secondary, the first science course in environmental science. It related to life situations and to the other subjects of the curriculum as well. This enables the students to learn other subjects well and to relate environment to such subjects, particularly advanced science and social studies.

In the preparation of curriculum and instructional materials, various curriculum development activities have been initiated to enhance student achievement. The major undertakings include the development of the Elementary Learning Continuum (ELC) and the Experimental Elementary Education Programme.

The ELC defines basic learning elements for all children and indicates how these should be sequenced for mastery. Key Behavioural Indicators (KBIs) have been identified and are reflected in the revised ELC. These KBIs are development-oriented and contain values intended to remedy certain weakness in Filipino learners identified by researchers. The ELC has been fielded for tryout and the 1980 output consisted of a revised version on the basis of analysis of feedback data. UNICEF assisted its printing.

The Experimental Elementary Education Programme (EEEP) was started in year 1978–1979 and has now completed its tryout. It was designed to satisfy the need for a curriculum which would produce good outcomes, in the
basic skills. When finally approved, the Programme will offer fewer subjects in the first two grades to allow mastery to basic skills. In effect, Science and Health subjects provide most of the content in learning English while Social Studies and character Education provide most of the content it Filipino in grades I to III. It also provides a common work–education curriculum for boys and girls which emphasizes the learning of values.

In addition to the ELC and EEEP, the following are students’ references:

- Soil conservation for K–grade VI
- Credit consciousness for K–grade VI
- Dangerous drug prevention education for K–grade VI
- Agrarian reform for K–grade VI

Teachers have references on these above four topics, as well as the following:

- Southeast Asian Science and Mathematics Experiment (SEA SAME) Manual for teachers.
- Instructional package of literature, music and dances and handbook for a self–teaching kit.

In addition there are pamphlets, radio and television materials, modules, a ‘do–it–yourself’ the kit, audio–visual materials and evaluative instruments.

At present, the environmental education at primary education level is integrated into the different subjects and at secondary education level it is integrated into science, social studies, biology, health communication arts, and at the tertiary education level is integrated into the part of population education in pre-service and in-service training. There are under graduate courses in different universities. The science-technology society course is run at the University of Philippine.

The environmental education topics have been integrated into the school curricula at all levels. At the primary and secondary levels, textbooks and supplementary materials on the environment have been produced. A number of environmental education materials for teachers have also been prepared. At the tertiary level, a survey conducted among universities and colleges has indicated that some universities are offering special courses.
on the environment at undergraduate and post-graduate levels whilst other universities are offering environmental subjects as part of the general education programme or as elective courses. Research is also being undertaken by the university teaching staff on specific environmental problems in the country. The research data have been utilized for environmental management programmes as well as for teaching purposes.

With regards to non-formal education, the National Environmental Protection Council co-ordinates with other interested government agencies in promoting public information programmes. The non-governmental organizations (NGOs) in the Philippines organize lectures, workshops and nature-focus activities besides film and slide presentations on the environment. Many of the activities of the non-governmental organizations (NGOs) are aimed at preserving and/or conserving specific flora and fauna in the Philippines. Also in the Philippines, the youth science fair is an annual competitive exhibition of investigatory projects of science club members. It begins at the local or school, provincial and regional levels and culminates at the national level where the selection of Ten Outstanding Young Science Researchers (TOYSR) takes place. On an average about 1,000 investigatory projects are entered in the contest annually. Some of the projects, submitted to the National Science Fair, have an environmental dimension. These include:

(i) The versatility of usually thrown away fruit seeds.
(ii) Cellulose from termites for ethyl alcohol production from agricultural wastes.
(iii) Rice harvester.
(iv) Wonder poultry feeds.

The promotion of public environmental awareness in the Philippines, the Press Foundation of Asia (PFA) with its headquarters in the Philippines, has conducted more than 76 workshops and seminars for various levels of journalists and has trained more than 1,500 journalists from Asia in a wide range of topics dealing with development issues which also include some aspects of the environment.
1–2.3(iv) Republic of Singapore

Singapore is a small island with 54 outlying islets situated at the southern tip of the Malay peninsula, to which it is linked by a 1056-metre causeway carrying both a road and a railway. Singapore covers an area of about 616.3 square kilometers and its population of approximately 3.45 million people in 1998. Singapore became a separate crown colony of Britain in 1946, and attained full internal self-government in 1959. In 1963 it joined Malaya, Sarawak and Sabah in the Federation of Malaysia. Tensions between Malays, dominant in the federation and ethnic Chinese, dominant in Singapore, led to an agreement under which Singapore became a separate nation on August 9, 1965. The population of Singapore is composite. The Chinese comprise 77%, Malays 15% and Indians 6%. As a result, Singapore becomes a multicultural country with a multicultural citizenry. With this regard, English, Malay, Mandarin, and Tamil are regarded as its official languages. Under this phenomenon, the younger people are bilingual and English, the language of commerce and government administration, is spoken by over half of the population.

The country is an entrepot for Malaysia and other Southeast Asian states. It is one of the world's largest ports. The chief exports are rubber and tin. Industries include tin smelting, rubber, lumber ship-building, textiles and oil refining, (Singapore is the largest oil refining centre in Asia) machinery, chemical products, food, tourism (7.13 million tourists in 1995) and banking. Standards in health, education and housing are high. Only about 1.7% of the total area is used for farming. Most food is imported.

In Republic of Singapore, environmental education is not taught as an independent subject in school, but subjects in the school curriculum include content related to the study of ecological and environmental education.

In primary school grades III to VI, emphasis is placed on the main theme 'Man and his Environment' in the Science curriculum.

In the secondary school students, can take the subject 'Human and Social Biology' which includes environmental studies.

Schools in Singapore have been actively involved in the National Campaigns since these were first launched in 1968. Students take part in
competitions such as slogan and poster designing, quizzes, debates, oratory contests and essay and song writing. Talks are given by quest-speakers, principals and teachers during assemblies and lesson-periods in most subjects, particularly Science, Civics and Education for living.

Non-formal environmental education aims first at informing the public about environmental health problems and teaching positive health measures that should be adopted to confront these problems. The health problems are those that come under the charge of the Ministry of the Environment, as indicated above. Public education is commonly carried out through massive campaigns and more recently by smaller-scale programmes on specific topic such as food-borne disease, DHF and proper disposal of refuse. Brief outlines of some of the more important of these programmes are:

Clean environment and anti-pollution

This education project aims at creating public awareness of the consequences of littering and pollution of our land and water courses and suggests ways of preventing this from happening. An eight-panel exhibition display has been produced. Colour slides on various aspects of pollution management are also produced.

Food hygiene

This project is aimed at all food handlers, to encourage a high standard of hygiene in food preparation and handling. Colour slides are produced for educational talks, as well as a series of education pamphlets and posters. Articles are also written for public magazines, and publicity is given on television.

Vector-control education

This campaign educates the public on the breeding habitats of the *Aedes* mosquito, which transmits dengue fever. As the habitats of the mosquito are man-made receptacles, the people can counter the disease by taking preventive measures suggested by the government. Colour slides as well as pamphlets and posters are produced for educational talks. Exhibits are also made for display at schools and community centres.
Proper disposal of refuse

This project aims to encourage the public to dispose of their refuse in a proper and hygienic manner. Pamphlets are produced and distributed widely to householders and shopkeepers. The message is also highlighted in the press.

To stimulate public participation, educational and publicity materials are produced and distributed. Following the campaign, the exhibits are moved to several community centres throughout the island. Publicity materials bearing educational messages are also made for transmission over radio and television, and the ministry’s staff deliver educational talks in schools and community centres, which often follow up with community projects such as ‘clean-up’ of the neigbourhood.

Teachers-in-training receive instruction on the various aspects of ecological and environmental education through one or both of the following pre-service courses:

1. Teaching of Biology Science (for Diploma of Education students), and
2. Teaching of Science (for non-graduate teachers).

Each course includes discussion of how to teach and to create among students greater awareness of and commitment to ecological, environmental and social issues that have urgent national and international significance.

In the implementation of environmental education is Singapore, mass campaigns usually involve the use of newspapers, radio and television to disseminate the educational messages. The government-owned radio and television stations in Singapore co-operate and support the ministry by producing news documentaries, interviews, panel discussions and advertising slogans. The local press provides coverage of campaign activities. Editorials often voice support of public campaigns.

1–2.3 (v) Brunei

(Brunei Darussalam) state of Brunei Darussalam Negara Brunei Darussalam, is a small, oil-rich Islamic sultanate which is able to provide free universal education and health services to all citizens. Located on the island of Kalimantan (formerly Borneo), Brunei is bordered by the two east
Malaysian states of Sarawak and Sabah. These areas were formerly British colonies, with Brunei gaining internal independence in 1963 and Sarawak and Sabah becoming part of the Malaysian Federation. This tiny nation-state, with an area of 5,765 square kilometres and a sparse population of 313,000 people in 1998. Brunei, mostly Muslims, form more than half of the population. The Sultanate, once a powerful and independent Kingdom, was annexed by Britain and was granted full internal autonomy in 1971. Became a fully sovereign and independent state on January 1st, 1984.

Oil and natural gas are Brunei's most valuable resources. Much of Brunei's oil comes from the offshore Ampa field. Over 40% of GDP is derived from oil and gas exports. Rice is the chief food crop. Also grows bananas, vegetables and cassava. Other crops are coconuts, sago and rubber. Rubber is an export item. The Sultan of Brunei is the world's richest man.

The history of environmental education is short in Brunei but everyone is aware of its importance. The objective of environmental education in primary and secondary school is to give pupils general ideas about environmental preservation and about hazards caused by pollution. This objective applies to education of the general public as well.

At present, the environmental education in Brunei at primary level is integrated into different subjects, at secondary education level it is integrated into various subjects, and at the tertiary education level into environmental studies in the under graduate courses.

At the Sixth ASEAN Ministerial Meeting on the Environment (AMME) held in Banda Seri Begawan, the capital city of Brunei in April 1994, Brunei also proposed to declare 1995 as ASEAN Environment Year (AEY) with the theme "Green and Clean". ASEAN Environment Year 1995 was set up to highlight ASEAN environmental issue and cooperative programme in order to stimulate awareness on these issues among the ASEAN populace and the world at large; broaden the participatory process in the private sector; and stimulate the regional activities in the environmental area.

The following activities at the national level are undertaken during the year:
Organization EXPO (s) on environmentally-friendly products.

Exhibition of environmentally sound technology and equipment.

Organization of various competitions including art essay, photo etc. on environmental topics.

Production of stamps souvenirs, coins, telephone cards on AEY theme.

Participation of the public and private sectors in AEY activities.

Organization of campaigns such as clean water campaign, collection of waste and classification of waste campaign, intensive environmental education and awareness campaign, clean up campaign, tree planting campaign, waste minimization and recycling campaign.

Leadership training of environmental volunteers.

1–2.3(vi) The Socialist Republic of Vietnam

The Socialist Republic of Vietnam (Comprising former North and South Vietnam) is a mountainous country in southeast Asia. Running almost its entire length, is mountain chain-the Annamite Chain. On one side of the mountain chain is the fertile Red River delta in the north and on the other side is the Maekhong delta in the south. The two deltas form the rice bowl of the country. The Socialist Republic of Vietnam covers an area of 329,566 square kilometers and its population of approximately 77.9 million people in 1998. Some 77 percent of the population live in rural areas. The French conquered the country from 1863 to 1867 in the south and from 1882 to 1883 in the center and the north. Vietnam declared its independence on September 2, 1945, Ho Chi Minh becoming the president of the new Democratic Republic of Vietnam. It took two wars, the first against the French, the second against the Americans, and a period of division between north and south (1954-75) before a unified Socialist Republic of Vietnam was inaugurated in June, 1976 with its capital at Hanoi. According to the pronouncements by the Communist Party of Vietnam, the revolution has three dimensions: revolution of the relationships of production, ideological and cultural revolution, and scientific and technological revolution.
The country is primarily agricultural. Rice is the dominant crop and an export item. Other crops are rubber, sugarcane, coffee, maize and tea. Minerals include coal, tin, copper, chromium and phosphate. Industry: Cement, metallurgy, chemicals, paper, food processing and textiles.

At present, the environmental education at the primary level is integrated into different subjects, at the secondary education level it is integrated into science and social science, and at the tertiary education level is integrated into environmental courses in some universities, training courses, and population studies course.

Environmental management courses for government officials are conducted four times a year, with emphasis on the socio-economic aspects of the environment. On the other hand, courses for technical manpower focus on the wise use of natural resources and the environment. The mass media play an important role in educating the general public. Radio, television, newspapers and journals regularly publish articles on the environment. Special television programmes for children are shown daily on different aspects of environment. In addition, special events are organized for the public on World Environment Day, National New Year and on Traditional Days. Some universities and tertiary level institutes have established the environmental courses. Among them are the Faculty of Environmental Engineering in Hanoi Polytechnic Institute and the Faculty of Public Sanitation in Hanoi Medical Institute.

Various non-governmental organizations (NGOs) such as the Association of Gardeners activity promote activities aimed at environmental protection. The youth is also involved in various environmental conservation activities in the country.

1–2.3(vii) Lao People’s Democratic Republic

Lao P.D.R. is a small and landlocked country in the Southeast Asia. It is bound by Vietnam in the East, by China in the North, by Myanmar in the West and by Thailand and Cambodia in the South. Lao P.D.R. covers an area of about 236,800 square kilometres and its population of approximately 5.4 million people in 1998. The climate is tropical monsoon with three main seasons a year—Rainy season (May–October)—Winter (November–
February) and Summer (March–April). The very fact that it was once known as ‘the land of a million elephants’ is testimony that Lao is a country of unusual attributes. The name has its origins in the legend which says hunters once lived throughout Lao who specialised in the capture and taming of wild elephants, so the national flag of the kingdom of Lao (Before 1975) was the three heads of elephants in a white band. After communist has ruled in 1975 the flag has changed to be a red band at the top and bottom with a large blue band between on which centered a large white circle. The population of Lao P.D.R. is ethnic groups; The Laos comprise 48%, Tribal Thai 14%, Sino–Tibetan including the H’mong and Yao 13%, Mon–Kmer 25%, Vietnamese and Chinese 1%. Its economy is based on agriculture. 85% of overall population of 5.2 million live in rural areas. Out of total area of 236,800 square kilometres, about 70% is mountainous and 47% covered by thick forest. It has an abundance of tributaries of the Maekhong River. The natural resources abound in the country. The deposits of tin, iron, coal, gold, copper, precious stones, potassium, phosphate, gypsum, salt and petroleum are found in many areas. Only some areas they have been exploited. Timber has become the main export item. The chief products are rice, maize, tobacco, cotton. Major industrial products are tin, timber, textiles.

Lao P.D.R. occupies a strategic position in Southeast Asia. A French protectorate since 1893, Laos became an independent sovereign state within the French Union in 1949. Conflicts among neutralist, communist and conservative factions created chaotic political situation. On December 2nd, 1975 the republic was proclaimed. In the 1980s, Vietnamese aid–military and financial was the chief support. Since 1988, investment from Thailand and U.S.A. has been substantial.

At present, the environmental education in Lao P.D.R. has been included in all levels of formal and non–formal courses. Environmental awareness publications are also encouraged by using various communication medias such as radio, TV, newspapers, magazines etc. The integration of environmental education in primary education level, secondary education level, and tertiary education level is integrated into science education and other subjects. The main objective of teaching science in
general schools is to train children at an early age to realize the scientific concept of the world so as to cultivate a correct attitude toward the various forms of superstitions. Specifically, it is to develop, objectively and logically, the concepts of the existence, movement and interrelationship of matter; hence gradually enabling children to understand the mastery of nature and to know how to transform nature for the service of man kind. The environmental education has been integrated into science education at the various levels with the following objects:

**Primary level:**
- To make children basically understand living and non–living things, to distinguish what are the useful and useless things for human life; to know the changes of seasons in each year; to know how to find out the four cardinal points of the compass; to know geographically and politically where Laos is located and its rich natural resources.
- To make children logically and objectively understand about natural phenomena, such as thunder, thunderbolts, thunderstorms, earthquakes, so as to counteract controversial concepts learned through superstitions. They should also realize what wind, water, fluids and liquids are, and how to use them in the service of mankind.
- To make children understand about the human body and related aspects of health, cleanliness and sanitation.

**Lower Secondary Level:**
- To give children a basic knowledge of systematic natural science, so as to develop their concepts and attitudes about nature, love of nature and the realization of natural phenomena.
- To make children acknowledge the role and contribution of science to human daily life, and how basic scientific criteria such as wind, water, heat, light are used in the sphere of agricultural production and animal husbandry.

**Upper Secondary Level:**
- To systematically constitute a wider and deeper knowledge of science so that students will be able to realize the basic principles and theories of
science and develop the ability to apply scientific knowledge in the transformation of nature to the benefit of mankind.

At the primary level science is taught as a basic subject and is not taught as separate subjects. It provides children with basic information about nature, and the content is linked to daily life, including the simple phenomena of nature, culture, animal raising, hygiene and prophylaxis.

At lower and upper secondary levels science is taught as separate subjects: zoology, botany, physics and chemistry.

The content of science curricula, in accordance with the present political and economic policy, science teaching and learning is focused on agriculture, forestry and irrigation development. The content at primary level is concerned with basic techniques of growing vegetables, cereal plants, and fruit. It also covers hygiene, disease and sanitation. At lower secondary level the content includes a practical approach to agriculture and animal raising with aspects of vegetable gardening, forestry and farming. The emphasis at upper secondary level is on improving living standards through such methods as the use of electric power, irrigation and the selective breeding of plants and animals.

The promotion of public environmental awareness, the development of general environmental awareness among the public in Lao P.D.R. has been largely due to the important role being played by the government and its related agencies, by the mass media, particularly press, radio and television deserve particular attention because of their flexibility and the wide audience they reach. Growing widely, mass media in Lao P.D.R. plays a leading role in publicizing new lines, the Party's new concept, knowledge about new mechanism, and new work style. It also contributes to organising, publicizing, encouraging, mobilising and stimulating cadres, Party members, combatants, and ethnic people in materialising the Party's renovation policy. Mass media praises outstanding persons, highlights new factors and lessons arising from labouring and study movements. Constructive ideas of the general public, their proposals and suggestions and social reality are reflected through mass media. Mass media is responsive to part of people's demand in acquiring information. Accordingly, mass media also serves as
the mouthpiece of the Party and State, for creating social environmental awareness.

1–2.3(viii) The Union of Myanmar

The Socialist Republic of the Union of Myanmar is located in Southeast Asia, bordered on the east by Thailand and Lao P.D.R., on the north by China, on the northwest by the Republic of India, on the west by Bangladesh, and on the south by the sea. The country’s territory of 676,553 square kilometres and its population of approximately 47.6 million people in 1998. It slopes from north to south, surrounded on three sides by a great horseshoe of mountains. Three river systems flow through the wide lowlands in the centre, providing drainage and water-transportation routes. The huge delta, where the capital city of Rangoon is located, forms one of the greatest rice bowls of the world, known as the ‘rice bowl of the Far East’. Myanmar also grows sugarcane, peanuts and beans. The chief minerals are petroleum, lead, tin, zinc, tungsten, copper, antimony, silver and gems. The rubies, sapphires and jade found in Myanmar are especially famous. Teakwood is exported.

At present, the environmental education at the primary education level is integrated into the ‘Patwinkyn’ or ‘Surroundings’ programme – no textbook, at the secondary education level is integrated into science and social science, and at the tertiary education level is integrated into environmental studies at undergraduate level.

In the Union of Myanmar, a unique strategy has been developed at the primary level which makes use of the out–of–doors as a means of developing environmental sensitivity and a love for nature. The ‘Patwinkyn’ or ‘Surroundings’ programme which was developed more than a decade ago in Myanmar is firmly rooted in the conviction that children should develop, from an early age, a healthy optimistic view of their environment, realizing that they are themselves a part of nature and that education is relevant to their surroundings. In this ‘Patwinkyn’ programme, textbooks are dispensed with and the children are encouraged to learn directly from the environment.

In Myanmar, public environmental awareness and education programmes in the form of holding of nationwide, World Environmental Day
celebration, annual tree planting programme, organization of training workshops and seminars and the promotion of public environmental education through the media is undertaken by the National Commission for Environmental Affair (NCEA) in the cooperation with the relevant ministries and departments. Accordingly, new Ministry known as “Ministry of Science and Technology” has been formed.

Promoting communication to the public through newspapers, editorial articles on global environmental issues and national environmental conservation efforts such as:

- Conservation and rehabilitation of forest.
- Fire wood substitution scheme.
- Special programmes on environmental conservation, greening projects, tree planting programme, reforestation project, wildlife conservation and national parks, interview programmes with officials from the National Commission for Environmental Affair (NCEA) and various government ministries and department are also broadcast on radio and television are being carried out more frequently.

There has been a rise and active movements with respect to environmental awareness in Myanmar, since the establishment of the NCEA. Thus, promoting public awareness and education programmes, increasing collaboration with international and regional agencies, greater cooperation and coordination between the Ministry of Education and Ministry of Information, as well as all other relevant ministries and the NCEA has been so as to carry out these programmes and activities of environment more intensively and effectively.

1–2.3(ix) The Kingdom of Cambodia

The Kingdom of Cambodia is situated in continental of the Southeast Asia, adjacent to the Gulf of Thailand between longitude 102° to 108° East and latitude 10° to 15° North. It covers an area of 181, 035 square kilometers and shares boarder of 2,438 kilometers with Thailand, Laos and Vietnam. The population in Cambodia is more than 11 million in 1998. The population of people, who is their age above 18 year, is about 5.5 million.
The standard of living cost is approximately US $ 200 per year. The official language is Khmer and foreign language are English and French.

The climate of Cambodia is hot and wet. The humidity and temperature change regionally and seasonally. The country is influenced by a wind current known as the Indian monsoon. The country is divided into two distinct parts:

1. The central low-lying land (the central plains), with a large part being less than ten metres in elevation and the flat coastal area.

2. The mountain ranges and high plateau surrounding the low-lying land.

About three quarters of the country is in the central plains while the remainder is in the higher area of the South and Southwest, and East, and Northeast. These distinct geographical features have shaped Cambodia’s culture and contributed to the country's rich diversity of flora and fauna. The main economic of the Kingdom of Cambodia is based on agriculture's (rice, crops, and rubber) aquatic productions, and wood and non-wood production. Since 1993, Cambodia has many investments mainly based on garment from outside countries and a bit part of light industries.

The Ministry of Environment (MOE, former State Secretariat of Environment from 1993 to 1995) was officially established in 1993. It plays the role of protecting and conserving the natural resources, preventing environmental pollution, and providing the environmental awareness to Cambodian. The MOE has main 5 technical departments, administrative and financial department, and other units. The main 5 technical departments are as follows:

- Department of Planning and Legislation Affair (Dept. A)
- Department of Nature Conservation and Protection (Dept. B)
- Department of Control Pollution (Dept. C)
- Department of Socio-Economic Resources and Data Management (Dept. D), and
- Department of Environment Education and Communication (Dept.)

In recent decades, Cambodia’s environment has deteriorated as a result of conflict, neglect and uncontrolled resources exploitation. The sustainable use of renewable resources including surface and ground water,
soil and land resources has been exceeded in some localized areas. The past policy had ignored environmental planning and the need for rehabilitation and protection. This has led to both the depletions of natural resources and the degradation of environmental quality manifested in atmosphere contamination, water pollution, soil erosion, loss of forest cover and biodiversity.

The MOE just developed the environmental legislation and it was approved by the National Assembly in 1996. This legislation is the main law (as an umbrella law) and MOE is continue developing degree and sub-degree for different environmental fields.

There are 23 National Parks were created by the MOE (divided into 7 National Parks, 10 Wildlife Sanctuaries, 3 Protected Landscape Areas, and 3 Multiple Use Areas) to protect and conserve natural resources, wildlife and bio-diversities. Preak Toal sanctuary (located in North West of Tonle Sap) is the greatest wildlife sanctuary in Southeast Asia and it has more than 300 species if water birds.

After civil war, Cambodia has shortage of human resources in various fields, in general. Particularly, there is very limited human resources within the MOE, even though they came from different backgrounds such as civil engineering, agriculture, industrial fields, etc.

The environmental awareness of Cambodian people is too low due to:

- The civil war spent more than 20 years.
- All infrastructures were destroyed during Pol Pot regime (1975–1979). A great number of literate people was killed at that time too.
- Environmental issues are a new concept in Cambodia (from November 1993)
- Environmental education not yet provides widely to people and official.
- Poverty problem (appeared after 1993).

Not only their awareness is limited, but also their participation in protection and conservation the environment is less. The main reasons that they pay less attention in environmental conservation and prevention are poverty (very low family’s income). They do not participate in conserving the
natural resources but, opposite, they make money by exploiting natural resources in negative ways.

The hunting wildlife for food and trading, use poison and dynamic for catching fishes and birds and use over-dated pesticides for agricultural purpose have led negative impact on the environment in Cambodia. Cambodian do such activities without understanding the impact from environment like polluting soil and water sources, destroying wildlife and so on. Not only the ordinary people but also officials lack environmental awareness and they need to improve their knowledge via training course and mass media.

The Environmental Education (EE) strategies mobilize all the elements that constitute the formalized methods of education within Cambodian through (i) Formal schooling (ii) Mass media and socio-cultural elements like religious networks, and (iii) Professional and occupational training.

Each element has taken the responsibility of delivering environmental education as a legitimate aspect of its activities and must accept environmental education as fundamental to accomplishing the objective of a better environment. The target audience can be divided into two main groups: government officials and decision makers, and the public at large. The large group is covered by the formal education sector and the public awareness sector.

Since July 1993, EE has focused on the following target groups:

1. **Government officials:**

   The Ministry of Environment in collaboration with UNDP/CEAT, IDRC, UNESCO, and IUCN, organized a series of lecture programme on general environmental issues. From 1993 to 1995, five programmes had been organized with the following objective in mind: to ensure that the MOE staff understand and support the mission and goals of the ministry.

2. **Formal Education Sector:**

   The Ministry of Environment and the Ministry of Education, Youth and Sport (MOEYS) initiated an Inter-Ministerial Committee for the Integration of Environmental Education in Primary and Secondary Schools (ICIEEPSS), in August 1993. This committee (with
representative from both the aforementioned governmental agencies, UNDP/CEAT and UNESCO) coordinated the integration of EE in public primary and secondary schools. In cooperation with UNDP/CEAT and UNESCO, the Committee organized two national seminar on EE (August 1993 and September 1994) and contributed to the development of a teacher’s guide and a booklet, both in Khmer and for primary schools. In cooperation with UNDP/ETAP, the Committee [now changed to IMSCEE: Inter-Ministerial Steering Committee for Environmental Education. It was joined by MOE, MOEYS, and MOCR (Ministry of Culture and Religion)] organized one national seminar (in May 1996) and 6 regional seminars (from May to June 1997) on EE for primary teachers. The IMSCEE have been developing EE materials (10 modules) for monk education curriculum. The national environmental seminar for monk education would be held at the end of 1998.

3. Public awareness:
   In July 1993, the MOE, in cooperation with UNTAC and UNDP/CEAT, produced short-term video-bites for TV broadcasting. The videos were targeted at the general public and aimed to inform the people of the importance of Cambodia’s forests. At that time, the production of additional videos was difficult due to the lack of facilities at the MOE.

4. Learning Needs
   Even though EE activities in Cambodia were received in abundant result (collaboration with NGOs and other government institutions), the Department of Environmental Education and Communication (DEEC) is facing to many obstacles such as:

1. Lacking of human resources:
   The MOE has approximately 600 staff came from different background. About 300 staff are currently working in base office in Phnom Penh, and the rest are working within 21 PEDs (Provincial Environmental Department) throughout country. There is 22 staff and supervisors are currently working within the Department of Environmental Education and Communication in main three technical offices and on administrative office. A few people responsible for Environmental Education and
Training Office. Not only their knowledge on the environment is very limited (never study on environment).

2. Lack of materials resources and equipment:
To conduct environmental training courses for all audience, we require environmental education materials and equipment. Unfortunately, the MOE lacks funding to support DEEC for installing educational facilities and developing EE materials. On the other hand, the MOE Library has mostly in foreign materials (about 99% were written in English), opposite the MOE staff is poor in foreign languages (English and French). There are no environmental education materials focus on environmental issues in Cambodia and write in Khmer language.

3. Policy:
Environmental Education is of fundamental importance; it provides the necessary knowledge, values and skill needed by the general public and decision makers to understand the complexities of the environment. The primary aim of environmental education is to enable citizens to understand and appreciate the complex nature of the environment. By the mean time, the government policy or NGOs policy for EE are not very concerning yet, because it takes long time to get the result from EE. Otherwise, the result from EE is not come directly from education sector but it goes through other implementing department like nature conservation and protection department, or environmental pollution department, and other technical departments. On the other hand, the government and NGOs happy to support any activities that easy to get the immediately result. They dislike to develop environmental mentality (ethics) because it takes time so long and abundant budget. However, environmental mentality development is one of the other components to ensure the sustainability of environment.

4. Budget problem:
From 1993 to 1995, the DEEC cooperated with UNDP, organized 5 training courses on general environmental issues. MOE offered few resources persons and UNDP provides whole financial support for each course. Since early 1996 to present, DEEC unable to organize any
courses due to lack of funding. EE activity will not be taken place; even though we have the resources persons, EE materials, workplan, etc.; but we lack of funding. Budget is one of the best supporting tool to approach the EE activity.

5. Public participation:
Many general public and official are not interested in attending the EE courses because of the poverty. They prefer to spend more time in daily business to earn money for supporting families than gain the environmental knowledge. They thought that, the environmental protection and management are not their duty, but the government responsibility. Today, without public participation, we can see many bad activities on threatening the environment such as wildlife hunting for food and trading, fishing in illegal ways, pollution problem, and so on. To ensure the quality of environment, we require participating from general public and strong environmental legislation. To attract the people for paying attention in environment, we have to provide them environmental awareness.

Cambodian’s environment mentality is decreasing from day to day due to the increasing of poverty in rural area, modernizing in urban area and their low environmental awareness. It is very essential to organize the environmental training course for all kind of audience, distribute the environmental issues in Cambodia and the globe via mass media and develop environmental education material for public and official to use. The quality of environment in Cambodia will be changed and rapidly improved when the Cambodian’s awareness on environment has been developed.

It is the time for changing the environmental situation in Cambodia. The powerful countries, spent an abundant of money to pollute Cambodian’s mentality during the cool war in the globe and via the civil war in Cambodia. Nowadays, all countries around the world are become friends and they open the door for welcoming free market. In this case, Cambodia not get only nothing from the civil war but also faces to the poverty and environmental problem. According to this matter, Cambodia needs for help from our friends.
in the globe to develop and improve environmental awareness for the sustainability of environment.

From the discussion about the environmental education programmes as well as public environmental awareness in 9 Southeast Asian countries: Indonesia, Malaysia, Philippines, Singapore, Brunei, Vietnam, Lao P.D.R., Myanmar and Cambodia it may be concluded that in almost all these countries, the study of environment is not treated as a separate subject. It is combined with science, geography, history, languages, literature, civics, health education, local studies, home-making, artistic education etc. The environmental education is also imparted through the various school activities such as Boy Scout Movement, the Junior Red Cross, Youth Environmental Awareness Camp, Exhibition, Practical and Technical work, Handicrafts, Practical work and School Gardening, Music and School Clubs etc.

1–3 OBJECTIVES OF ENVIRONMENTAL EDUCATION

The objectives of environmental education are part of the general objectives of education which have been defined variously by different thinkers, classicists, humanists and scientists. Still most of them seem to agree with Herbert Spencer that education should prepare for complete living, which does not mean living in the material sense merely but in the widest sense. That is, an educated person should know how to lead a healthful life, how to prevent oneself from sickness, general debility, premature decrepitude, and is short, how to treat the body; in what way to develop the intellect and to treat the mind; how to prepare for earning a living and to secure the necessaries and comforts of life: how to rear and discipline off springs; how to maintain proper social and political relations; how to spend leisure time so as to gratify tastes and feelings; and in what way to use talent for the greatest advantage of the self as well as of others. For the accomplishment of most of these objectives, environmental education is an important medium. This is the reason why Zakir Husain wanted that environment and productive work should be used as means of learning. He said that there are three important components in Gandhiji’s Basic
Education: natural environment, social environment and craft work. Which should be used to draw out the best in child and man. (Sharma, 1981).

The objectives of environmental education can be subsumed in the following components: cognitive, affective and psychomotor.

1. **Awareness**: To help individuals and social groups acquire an awareness of and sensitivity to the total environment and its allied problems.

2. **Knowledge**: To help individuals and social groups acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.

3. **Attitude**: To help individuals and social groups acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.

4. **Skills**: To help individuals and social groups acquire the skills for solving environmental problems.

5. **Evaluation ability**: To help individuals and social groups evaluate environmental measures and education programmes in terms of ecological, political, economic, social, aesthetic and educational factors.

6. **Participation**: To help individuals and social groups develop a sense of responsibility and urgency regarding environmental problems to ensure appropriate action to solve those problems.

Since the establishment of IEEP in 1975, over 130 countries have been involved in its activities. It has produced two source books on formal and non-formal environmental education, prototype modules for formal education and teacher training, a guide on environmental education methodologies, an audio-visual packages etc. UNESCO-UNEP International Congress on Environmental Education and training was held in Moscow, from 17-21 August 1987, and was attended by over 300 specialists from 100 countries and observers from IUCN and other international organizations. This Congress outlined an international strategy for action in the field of environmental education and training for the 1990's. The Conference set the nine objectives and actions for the international strategy for the 1990's.
Objective 1: Access to Information:

Strengthening of the international system for information and exchange of experience of the International Environmental Education Programme (IEEP).

Actions: Setting up a computerized service; Strengthening regional networks of institutions of excellence and documentation centers; Publication of the newsletter "Connect".

Objective 2: Research and Experimentation:

Strengthening of research and experimentation on educational content and methods and strategies for the organization and transmission of messages concerning environmental education and training.

Actions: Research and experiments concerning educational content and methods; Research and experimentation concerning other complementary aspects of environmental education; Research concerning the pedagogical approach to the question of values; Research concerning new strategies for the transmission of messages to develop environmental awareness, education and training; Comparative evaluation research on the different components of the educational process.

Objective 3: Educational Programmes and Training Materials

Promotion of EE through the development of curricula and teaching materials for general education.

Actions: Exchange of information on curriculum development; Development of model (prototype) curricula; Development of new teaching aids; Promoting curriculum evaluation.

Objective 4: Training of Personnel.

Promotion of pre- and in-service training for qualified formal and non-formal environmental education personnel.

Actions: Promoting pre-service training; promoting in-service training.

Objective 5: Technical and Vocational Education

Incorporation of an environmental dimension into technical and vocational education.
Actions: Development of programmes and materials for education and training; Training and developing the awareness of teachers; A priority activity in the service sector.

Objective 6: Educating and Informing the Public

More effectively educating and informing the public about the environment through the use of the media and the new communication and information technologies.

Actions: Producing media-related education programmes; Use of new communication media and activity teaching methods; Creation of a bank of audio-visual programmes; Development and use of exhibitions and museums; Developing UNESCO-UNEP joint activities.

Objective 7: General University Education

More effective incorporation of the environmental dimension into general university education through the development of study programmes, teaching materials and training, and through the establishment of appropriate institutional machinery.

Actions: Developing the awareness of academic authorities; Development of study programmes; In-service teacher training; Institutional intra-university cooperation.

Objective 8: Special Training

Promoting specialized scientific and technical environmental training.

Actions: Initial training for environmental specialists; Further training for professionals including decision makers and administrators; Training through research; Development of suitable study programmes; Use of natural parks, biosphere reserves and other protected areas; Strengthening regional training capacity.

Objective 9: International and Regional Cooperation

Development of environmental education through coordinated international and regional cooperation.

Actions: Exchange of information; Promotion of research and experimentation; Promoting training; Study programmes; Information on legislation concerning environmental education, natural resources and environmental management; Regional action within the framework of IEEP;
Mobilization of technical and financial resources; Inter-agency coordination and consultation at the international level; World Decade for Environmental Education, 1990-2000; International congress on EE and Training for the beginning of the twenty-first century.

In view of the fact that worldwide development of environmental education is a lengthy and complex process, the Congress considered it desirable to designate 1990-2000 as the "World Decade for Environmental Education". The programmes developed for this decade should emphasize the interrelationships between people and the biosphere in their full range of economic, social, political, cultural and ecological dimensions. It was decided that another International Congress on Environmental Education and training be held in 1997 to take stock of the progress made after the Moscow Congress, and to draw up priorities, means and actions for the first decade of the twenty-first century.

Guiding Principles of Environmental Education Programmes

The guiding principles of environmental education are:

1. Environmental education should consider the environment in its totality- natural and man-made, ecological, political, economic, technological, social, legislative, cultural and aesthetic.

2. Environmental education should be a continuous life-long process, both in– school and out-of-school.

3. Environmental education should be interdisciplinary in its approach.

4. Environmental education should emphasize active participation in preventing and solving environmental problems.

5. Environmental education should examine major environmental issues from a world point of view, while paying due regard to regional differences.

6. Environmental education should focus on current and future environmental situations.

7. Environmental education should examine all development and growth from an environmental perspective.

8. Environmental education should promote the value and necessity of local, national and international cooperation in the solution of environmental problems.
1-4 STRATEGIES FOR ENVIRONMENTAL EDUCATION (EE) PROGRAMME

The main strategy in the incorporation of the environmental dimensions into the formal education process, has been to infuse content relative to various environmental problems into the natural sciences (biology, ecology etc.). However, appreciable progress has been made by some countries to incorporate environmental content into social studies such as geography, history and economics. This provides evidence of some progress towards the holistic approach to environmental education. Nevertheless, with regard to the content of environmental education programmes, too much emphasis is still placed on theoretical cognitive aspects; affective components (values, attitudes) and techniques are still given very little attention, sometimes almost none, in current environmental education.

While trends in the development of environmental education and training at the different school levels (primary and secondary) and types (formal and non-formal) are on the whole the same in countries in the region, there are noticeable variations.

The importance of an "interdisciplinary approach" as the best way to deal with the complexity of environmental problems, throughout the education process and to provide a basis for effective action designed to solve them was recognized by the Tbilisi Conference and later endorsed in many regional and sub-regional meetings. Such an interdisciplinary approach is still difficult to achieve in most countries. Some of the major obstacles relate to teachers being insufficiently aware of the importance of interdisciplinary work and the lack of suitable educational materials or resources. A few countries have undertaken interdisciplinary educational activities concerning the environment at the various levels of formal and non-formal education by including environmental concerns such as nature of the importance of interdisciplinary work and the lack of suitable educational materials or resources.