CHAPTER - I

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1.1. INTRODUCTION:

Man is an integral ingredient of physical and biological world in which he lives. In a broader sense, we may define this physical and biological world as 'environment' which consists of biotic (living) and abiotic (non living) components. All the physical and biological aspects of human survival involve some kind of interaction with his environment. Such an interaction is not only essential but also unavoidable for satisfaction of human needs, which are basic for existence. In the modern era, the development is more oriented towards industrialization and technology. The environment and development has not been keeping pace with each other. The modernization in terms of construction of dams, development of habitations and industries in and around forests have completely misbalanced the ecology and environment in the areas, where such developments are taking place. The modern technology has certainly advanced in many ways positively, however, it has also destroyed the environment aspects in many ways. Due to this, the human and other living beings are now going through various types of diseases,
dwarfism as well as allergies of different kinds in which the human life is at stake along with the national resources. Today the conservation of environment and prevention of environmental degradation are the crucial challenges before the humankind. There is an urgent need to develop sensibility and eco-environmental awareness among people.

There is a Chinese proverb, “If you plan for one year, plant rice, if you plan for ten years, plant trees and if you plan for 100 years, educate people.” So if we want to save our mother Earth, we have to make all the persons environmentally educated. If we want our mankind to flourish, there is a strong need to conserve our natural resources and make judicious use of them. We must think of earth as a habitat not of today but of a distant tomorrow where there will be place and means for every being alive. This leads to development of concept of Environmental Education (EE).

Environmental Education is a process of providing learning experiences to obtain knowledge understanding, skills and awareness with desirable attitudinal changes about man’s relationship with his natural and man made surrounding which includes the relation of population, pollution, resource allocation, transportation, technology and urban and rural planning to the total human environment. EE must utilize diverse learning environment and a broad array of educational approaches to teaching learning about and from the environment with due
stress on practical activities and first hand experiences. It should help learners to discover the symptoms and real causes of environmental problems and thus, to help develop critical thinking and problem solving skills. EE should be a continuous life long process, beginning at the pre school stage level and continuing through all formal and non formal stages and should be interdisciplinary discipline are making possible a holistic and balanced perspective. EE has the target population that includes students, teachers, doctors, engineers, and common man. The EE include opportunities to acquire the knowledge, values, skills, attitudes, commitment and improve the environment and to create new patterns of behaviour of individual group and society as a whole towards society. Therefore, it requires that appropriate action takes place in the behaviour to protect and improve the environment. EE programme includes development of correct values and attitudes towards environment.

1.2 NEED AND IMPORTANCE OF ENVIRONMENTAL EDUCATION

Education is a lifelong process. It proceeds both formally and informally through schools, private organizations, communication media and continuing experiences. No effective modification or improvement of attitude and behaviour of man towards his environment can occur without broad educational efforts at all levels of the society. People need to learn
ways to perceive environmental problems and opportunities, acquire information for forming and evaluating alternative solutions, and develop the cultural skills for living according to chosen alternatives. All of these demands a high and continuing educational input in terms of continuous formal and non formal environmental education. Environmental education is based on the premise that ecological balance in needed for promoting quality of human life. It promotes attitudes of concerns for the quality of the biophysical environment, which will motivate citizens to participate in solving biophysical environmental problems. Environmental education and research are necessary because many environmental problems that cannot be solved by government alone can be solved by individuals, and the individuals must be educated to know what needs to be done. With enormous ignorance of vital environmental problems it is disheartening to realize that in many countries including India, lot of time and money are being spent on environmental destructive activities than constructive ones.

The need for a better understanding of the nature, extent and ultimate implications of human impact on the natural environment is, perhaps the most pressing and most important aspect of education for the decades. The need for environmental education has also been formally acknowledge at both the national and international levels. It was explained in the background to the US Environmental Education Act that
"We as a society can no longer offered the luxury of not knowing the environmental consequences of our decisions. The citizens of the country, both present and future, must understand the ecosystem and sensitive interrelationships among its parts. Each phase of education, from preschool through adult and continuing education, must be recorded to permit introduction of ecological understandings".

The need for education related to environment has been stressed by National Policy Education (NPE) (1986) with modifications undertaken in 1992. In Part III of the report of NPE (1986), it has been reported under the caption "immediate task", that the national system of education will be based on a national curricular framework which contains a common core along with other components that are flexible. That common core will include the history of Indian freedom movement, the constitutional obligations and other contents essential to nurture national identity. These elements will cut across subject areas and will be designed to promote values such as India's common cultural heritage, egalitarianism, democracy and secularism equality of sexes, protection of the environment, inculcation of scientific temper, etc. In Part VIII, under the caption “Reorienting the content and process of education”, the need for environmental education has been expressed in the following words "There is a paramount need to create environmental consciousness. It must permeate all ages and all sections of society beginning with the
child. Environmental consciousness should be developed through teaching in schools and colleges. This aspect will be integrated in the entire educational process.

Education and training on environmental problems are vital to the long-term success of environmental policies because they are the only means of mobilizing an enlightened and responsible population, and of securing the manpower needed for practical action programmes. This was stressed as a prelude to recommendations for international action at the UN Conference on the human environment.

In many cases, industrialized countries not only export serious environmental problems but also do not always propose solutions that interest of development and social progress in regions of the third world and preservation of the environment demand a well prepared population and enlightened institutions that could bring about the process of creating new forms of actions and economic activities that would respect the need for maintaining the ecological balance. Environmental education has a significant contribution to make to this process.

No individual isolated effort can alone solve the problems of environmental degradation at the global level. These problems are clearly international and must be solved through international cooperation. Such cooperative action presupposes a common understanding of the environmental problems and the acceptance of responsibility for their
ultimate solution. It is the prime function of environmental education to develop this understanding and responsibility.

It was also expressed at the Stockholm International Conference (1972) that environmental education sought to create a responsible attitude among the entire world population towards the use and care of natural resources, and the protection of the environment on a whole against damage from pollution and other dangers. The aim of environmental education is to maintain and improve the quality of human life on earth through the long-term beneficial management of both natural and man made resources.

Environmental education is required to promote among citizens of all the countries in the world, the awareness and understanding of their environment, their relationship to it, and the concern and the responsible action necessary to assure their survival and to improve the quality of human life on earth. More than anything else, environmental education seeks to develop, from the individual to the population level and for every cultural, geographical, age and intellectual group, an awareness of the complex, dynamic interrelationship between man and his total environment and the need for sustainable development. Since time immemorial human being (and animals too) have exploited the environment and natural resources for their necessities, comforts and
luxuries. Since these sources are finite, we need to consume them with
great care and concern.

In the industrial era, the pace of exploitation has reached to such extent
that self stabilization is not possible.

In his greedy of material wealth and higher standards of life, man has
shown disregard for the impact of his activities on the environment.

Environment degradation has resulted in numerous problems, some of
which are so large that they treason the very existence of life on earth.

Pollution of soil and water with human waste and subsequent
contamination of food and drink, produce infection which in combination
with malnutrition, leads to the largest single category diseases.

Disasters like Bhopal gas tragedy of 1984, has drawn the attention of
every one towards environmental safety from chemical pollutants.

Since industrialization is essential to provide the basic necessities of life
to our exploding population, planning and managements are needed for
proper environmental balance. Environmental education can play an
important role in this process.

Environmental education can lead to better understanding of the
environment by giving the people knowledge of the universe, society and
individuals and by helping them in understanding their attitude towards
each other and their bio-physical and socio-economical environment.

Smt. Indira Gandhi at the First International Conference on Environment
Education, held in New Delhi in 1981, said that “environmental education is to help arouse social consciousness and make community aware of the fact that greed of the individual and that of the make community are both harmed by ecological disruptions”.

**National Consultations on Environmental Education:**

The first consultation on the academic aspects of EE in schools was organized by National Council of Educational Research and Training (NCERT) on 13-14 February, 2004 in New Delhi. Participants comprising eminent scientists, environmentalist officials of central and stage government departments dealing with environment, senior academicians attached to departments centers of environmental studies, environmental sciences, etc of different universities, teacher educators, principal of teacher training colleges, prominent Non – Governmental organization (NGOs) and National Council of Educational Research and Training (NCERT) faculty took part in deliberations. The second consultation on the implementation of EE in schools was held on 13th March, 2004. the initial draft prepared by NCERT faculty presented in the First consultation was revised as per the suggestions received. This revised version was presented in the second consultation and suggestions for further improvement were received.
The Hon'ble Supreme Court’s directive to develop a model syllabus of EE as a compulsory subject in a graded manner for the entire school stage was welcomed. National curriculum Framework for school Education (NCFSE, 2000) has already made recommendations of reaching consequences with regard to environmental education for different stages of school education. Wide ranging suggestions received through consultations include identifying the mission and objective of EE, initiating proactive action and reforms in curriculum and syllabus, pedagogy and class room transaction, evaluation teachers education and implementation strategies.

1.3. EE – An Overview:

Global Scenario:

The beginning of the environmental movement from Rachel Carson, an American scientist, published in 1962 her well documented book SILENT SPRING, she called upon people to visualise a world where there will not be a single flower or a bird singing during spring season, making, the entire environment silent. U Thant, the former secretary – General of U.N, speaking in the general Assembly in 1969 to improve human environment within a decade, failing which environmental problems will have assumed such staggering proportion that it could be beyond the human capacity to control them.
The United Nations reflected the global nature of the awareness when in 1972, it organized the first international conference on the Human Environment in Stockholm, Sweden. The conference revealed a widening interest in the Environment and established the generality of environmental problems. It also exposed a lack of widespread experience in tackling the problems. Perhaps the most outstanding achievement of the conference was the establishment of the United Nations Environment Programme (UNEP) which together with UNESCO, embarked upon an International Environment Education Programme (IEEP) in January 1975.

In October 1975, this programme held on International Environmental Education workshop in Belgrade, Yugoslavia. A major outcome of this workshop was the Belgrade charter. This charter recognized the urgent need in EE to develop a global understanding or perspective of the ecological, economic and moral considerations. It also provided an excellent frame of reference for the task of designing EE programmes from the realities of an Environmental situation.

The Belgrade Charter said, Environmental Education should:

- Consider the Environment in its totality natural and man made ecological, political economic, technological, social, legislative, cultural and aesthetic;
• Be a continuous life long process both in school and out of school.

• Be interdisciplinary in its approach;

• Emphasize active participation in preventing and solving Environmental problems;

• Examine major Environmental issues from a world point of view, while paying due regard to regional differences;

• Focus on current and future Environmental situations;

• Examine all development and growth from an Environmental perspective;

• Promote the value and necessity of local, national and international co-operation in the solution of Environmental problems.

Regional symposia held during 1975-77 in; Europe (Helsinki), Africa (Brazzaville and Lagos); Arab States (Kuwait); Asia (Bangkok); Latin America (Bogata); North America (Ottawa) and East Europe (Prague). The outcome of these world wide consultations provided materials for an intergovernmental conference held in Tbilisi in 1977 that launched the International environmental education programme (IEEP).
In 1977 the Inter-governmental Conference of Environmental Education was organized at Tbilisi, Georgia. It outlined a substantive structure of environmental education, which was to become prototype for environmental education programmes world wide. The recommendations of this conference are contained in the historic document, known as "The Tbilisi Declaration", The goals, objectives and guiding principles of environmental education were defined in clear categorical terms.

As a sequel to Stockholm Conference on Human Environment, a number of international conferences were held about environment, some of them were:

- International Conference of Human Settlements, held at Vancouver during 1976;

- International Conference on Water, held at Mardel Plata during 1977;

- UN Conference on Desertification, held at Nairobi during 1977; and

- International Conference on Science and Technology, held at Vienna during 1979.
The deliberations of these conferences provided inputs for curriculum construction in Environmental Education.

The Montreal Protocol, 1987 stipulates that both developing and developed nations should stop production and consumption of ozone-depleting substances like chloro-fluro carbons (CFCs etc) by the year 2000 A.D. The industrialized countries take the lead in the matter. This agreement among nations represents for the first time preventive action much before the problem of depletion of ozone layer assumes alarming proportion since its discovery in 1985. Developing countries are also given financial assistance for phasing out the CFCs and other such substances.

The general Assembly of the UN decided in 1989 to convene a UN Conference on Environmental and Development (UNCED) in 1992. On the 20th anniversary of the Stockholm Conference, the conference popularly called 'Earth Summit' was held during 3-14 June at Rio-de-Janeiro, attained by a large number of heads of government, NGOs, representatives of international bodies, industry, trade unions, local governments and others.
Agreements reached at “Earth Summit” include:

1. A Framework Convention on climatic change to stabilize concentration of green house gases at a safe level.

2. A convention on Biodiversity to identify and protect the variety of plant and animal species and their habitats.

3. A statement of Principles for the sustainable management of forests.

4. Agenda 21, an action plan for environmental protection and sustainable development for the next century through:

   • accelerated sustainable development through international economic policy;
   • alleviation of poverty;
   • ending of wasteful consumption;
   • addressing demographic dynamics;
   • promotion of sustainable human settlement;
   • protection and promotion of human health;
   • integration of environment and development in decision making process;
   • reclamation of degraded land.
5. The establishment of a new UN Commission on Sustainable Development.

In pursuance of the recommendations of Rio conference, a Global Environmental Facility (GEF), to be managed jointly by World Bank, United Nations Development Programme (UNDP) and United Nations Environment Programme (UNEP) was set up with the target of acquiring a corpus of $600 billion to implement Agenda 21. Though UN Conference on Environment and Development (UNCED) did not live up to the expectation of high hopes generated undoubtedly it exhibited mankind's remain for problems of the environment.

**National Scenario:**

EE was practiced in ancient times too, though more attention under the term 'nature' was paid to the physical, chemical and biological factors. The Indo-Aryan lived in complete harmony with nature and enjoyed its beauty. Both in the pre-vedic and vedic periods the Aryans sang hymns in deep appreciation of nature.

Religious teachings of many religions like Buddhism, Jainism, have given importance to environment and have spelled out how to live in peaceful co-existence with the surrounding and laid down specific guidelines, principles and practices for preservation of plant and animal life.
The importance of environment has been recognized in India since long. This is also reflected in its constitution, (Article 51 A) where it states “It shall be the duty of every citizen to protect and improve the natural environment, including forests, lakes, rivers and wildlife and to have compassion for living creatures”. Madhusharma (2006). It appears that initially the constitution of India concerted provisions aiming at protecting and improving quality of environment.

In Stockholm conference 1972 where 1,500 heads of the state governments representing members of the UN met, Mrs. Indira Gandhi the Prime Minister of India participated and strongly voiced her environment concerns. She had constantly given strong and wise leadership to Indian and international efforts at environmental planning. She pioneered a series of practical measures for environment protection and control of pollution in India. She encouraged wise use of natural resources, and set an example for the rest of the world to follow she was committed to the “Project Tiger”.

The Prime Minister, Rajiv Gandhi arranged to build the proposed fertilizers factory at a safer distance from Ranthambore Tiger Reserve. He took keen interest and gave personal attention to “Cleaning of the Ganges”, project inspired by the Gange Action Plan. For this tanneries of
Kampur were being pulled up and in Varanasi, electric crematoriums and sewage treatment plants were being constructed.

A powerful environmental movement has grown up on the slopes of mountain of Himalayas in Dec 1972 under the leadership of Shri Sunderlal Bahuguna. Illiterate tribal women in the Tehri Garhwal district of Uttar Pradesh have created an effective non violent way to stop the devastation of forest by industries when the men with axe came, the women formed a ring around the trees, by embracing the trees. This movement is named of as chipko movement.

In the administrative structure of India, the Department of Education, Ministry of Human, Resource Development (MHRD) is responsible for integration of EE into the formal educational system at all levels. The National Council for Educational Research and Training (NCERT) takes care of school level, at the college / University level it is the university grants commission (UGC) takes the responsibility. The Ministry of Environment and Forests (MOEF) plays the role mainly of interacting actively with the UGC, NCERT and the MHRD for introducing and expanding environmental concepts, themes, issues etc, in the curricula of schools and colleges. The responsibility of developing policies and strategies for creation of awareness amongst all the people about environmental issues through nonformal methods has been
entrusted to the Ministry of Environment and Forests. A Major programme of MOEF which has completed more than a decade of implementation is a unique programme called National Environment Awareness campaign (NEAC) launched in 1986, has a single monumental objective, that is to create environmental awareness at every level of India’s population. Recognising that school children are the future decision makers of the country, a special programme called ECO or Environment or Nature clubs are set up. Since 1993, more than 9000 Ecoclubs have been supported (Financial and technical) by MOEF. Centers of Excellence on EE are Center for EE (CEE) Ahmadabad (1984) and CPR Environmental Education center was established at the C.P. Ramaswamy Aiyer Foundation at Chennai in 1988, conducting country wide EE activities and to create environmental awareness among children women, youth and the public. MOEF initiated the Environmental Management Capacity building (EMCB) project for implementation of EE in school system.

India is a signatory to the international conventions like convention of International Trade on Endangered species (CITES) and Convention of Migratory Species (CMS) which aim at conserving Biodiversity. India joined Global Learning and Observations to Benefit the Environment (GLOBE), an international science and education program during 2000.
This program, which unites students, teachers and scientists all over the world, is aimed at school children about 100 schools spread over different parts of the country have already joined this program.

1.4. Concept and Characteristics of EE:

1.4.1. Meaning and Concept of EE

Environmental Education establishing an ecological equilibrium which implies proper use and conservation of resources and also control of environment pollution. According of Council of Europe (1976) “EE is the process of recognizing values and clarifying concepts to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and has biophysical making and self formulation of code of behaviour about issues concerning environmental quality”

According to US office of Education “Environmental Education is the process that fosters greater understanding of society’s environmental problems and also the process of environmental problems solving and decision making. It involves the department of skills and insights needed to understand the structure, requirements and impact of interactions within and among various environmental entities, subsystems and systems.”
According to the United States Environmental Act (1970) sec.32 “Environmental Education means the educational process which deals with man’s interrelationship with his natural and man-made surroundings and includes the relation of population, pollution, resource allocation, and depletion, conservation, transportation, technology, and the urban and rural planning with the total human environment”.

Thus definitions of environmental education encompassed a variety of concepts and approaches, with varying emphasis on each of them. The essential features of these definitions are:

- Knowledge and understanding of environment, its associated problems and future consequences.
- Understanding the subtle relationship between man and man, man and nature and its appreciation.
- Value clarification, development of attitudes, interest and awareness concerning quality of environment.
- Decision making and problem solving.
- Formulation of code of behaviour.
There are three important connotations of environmental education:

**Education through Environment:**

Here the environment is viewed as a medium of instruction and transaction. Selected real life situations are used as the basis for learning and enquiry. Emphasis is laid on open-ended environmental tasks involving investigations, enquiries and field studies, covering a variety of issues and problems pertaining to different types of habitations.

**Education about Environment:**

In this connotation, the biophysical components of the environment, that constitute and support the human environment and determine the human quality of life, need to be explored and understood, for a purposeful and gainful management, monitoring, harnessing and developing the human life supporting systems in a sustainable way (including living and non-living objects, as well as their intra and interactions and their products).

Education about environment is a study where components of environment, biophysical and socio-cultural, are investigated through the disciplines of physical and biological sciences and social science under the umbrella of environmental sciences to further improve the quality of human life and protect the environment. The environmental education
can be made with reference to a specific or a restricted area to gain information and comprehension. These could be conducted in the field as well as in the laboratory under simulated condition, under the guidance and supervision of the teachers.

**Education for Environment:**

Education for environment means education for protecting conserving and improving the environment. This involves diagnosis and identification of environmental problems and working towards their solution. The remedial solutions should take cognizance of the quality and quantity/magnitude of the impact of anthropogenic activities besides the existing environmental ethics. Problem solving, decision – making and critical judgmental skills are called for here. It is in this context that environmental education affects realms positively towards the environmental resources and population issues.

**1.4.2. Characteristics of EE:**

1. Environmental education should be a continuous process.

2. Environmental education should be interdisciplinary with each discipline playing a specific role in making possible a holistic and blanched perspective.
3. Environmental education should emphasize active participation in preventing and solving environmental problems.

4. Environmental education should get insights into environmental conditions of other geographical areas.

5. Environmental education should emphasize the complexity of Environmental problems and thereby the need to develop critical thinking and problem solving skills.

6. Environmental education should help learners to find out the symptoms and the real causes of Environmental problems.

7. Environmental education should be imparted to all sections of society through formal and non-formal methods.

Environmental Education should not be treated merely as one more subject, otherwise only a few specialists would be interested in it. A new approach should be adopted which should bring about awareness in all areas. It should also be devised to search for meeting the diversified demand of our country.
1.4.3. AIMS AND OBJECTIVES OF ENVIRONMENTAL EDUCATION:

A basic aim of environmental education is to succeed in making individuals and communities understand the complex nature of the natural and the built environments resulting from the interaction of their biological, physical, social, economic and cultural aspects and acquire the knowledge, values, attitudes, and practical skills to participate in a responsible and effective way in anticipating and solving social problems, and in the management of the quality of the environment.

Environmental education, is a lifelong continuing process and has to be imparted at all levels, formal and non-formal. Despite increased awareness of the environmental issues and concern over the deterioration of our environment, the human environment has only continued to show signs of further deterioration. Bhopal tragedy, Chernobyl disaster or the recent pollution of Rhine are only few examples of the serious situation faced by mankind today. If we cannot ensure that such events shall not occur again in future, the future of mankind shall remain uncertain. This requires not only to ensure incorporation of enough safeguards at the planning and execution phases of development projects, but environmental education at all levels, every individual should be environmentally conscious and aware of his or her duties and
responsibilities to safeguard the environment for today and tomorrow. Each individual must understand the possible environmental consequences of development projects. The decision makers (bureaucracy and the politicians) should understand and take into consideration environmental aspects in the developmental process and also appreciate the need for and values of conservation. Environmental education must provide for enough expertise at all levels for managing the natural resources in environmentally sound manner and at the same time to handle any unexpected environmental problem effectively and expeditiously.

**Goals of Environmental Education**

The goals of Environmental Education are to develop concern and awareness among world population about the total environment and its associated problems and commitment to work individually and collectively towards solution of current problems and the prevention. The goals of environmental education are:

i. To improve the quality of environment.

ii. To create an awareness among the people on environmental problems and conversation.
iii. To create an atmosphere so that people participate in decision-making and develop the capabilities to evaluate the developmental programmes.

The objectives of EE are as follows:

1) **Awareness**: Environmental education helps individuals and social groups to acquire an awareness of and sensitivity to the total Environment and its allied problems.

2) **Knowledge**: Environmental education helps individuals and social groups to acquire basic understanding of the total environment, its associated problems and humanity’s critically responsible presence and role in it.

3) **Attitude**: Environmental education helps individuals and social groups to acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.

4) **Skills**: Environmental education helps individuals and social groups to acquire the skills for solving environmental problems.

5) **Evaluation ability**: Environmental education helps individuals and social groups to evaluate environmental measures and education
programs in terms of ecological, political, social, aesthetic and educational factors.

6) Participation: Environmental education helps individuals and social groups to develop a sense of responsibility and urgency regarding environmental problems for ensuring appropriate action in solve those problems.

Taxonomy of Educational objectives of EE can also be categorized into different domains as described by Bloom – cognitive affective and psychomotor.

1) Cognitive objectives of Environmental Education: These are those objectives, which are concerned with the real or recognition of knowledge and development of intellectual skills and abilities. These objectives are as follows:

- To acquire knowledge of the immediate environment.
- To Acquire knowledge of the Environment beyond the immediate Environment including distant Environment.
- To understand the biotic and abiotic Environment
- To diagnose the different causes of Environmental pollution, and to recommend remedial measures.
➢ To diagnose the causes of social tension, and to recommend methods for avoiding them.

➢ To understand the inter dependence of life at various tropic levels.

➢ To understand the effect of unchecked population growth or unplanned resource using the world of tomorrow.

➢ To examine trends in the growth of population, and interpret them for achieving the socio-economic development of the country.

➢ To evaluate the using of physical and human resources, and to recommend remedial measures.

2) Affective objectives of Environmental Education: These objectives are related to creating interests, forming attitudes, fostering values, developing appreciation and making adjustments, these objectives get influenced by Environment at home, school in the neighborhood and in the community. These objectives are as follows:

➢ To create interest in the flora and fauna of the near and distant environment.

➢ To create interest in the people and problems of the community and society.

➢ To show tolerance towards different castes religions and cultures.

➢ To appreciate the gifts of nature

➢ To love the neighbours and value mankind as a whole
➢ To appreciate equality, liberty, fraternity, truth and justice.

3. Psychomotor objectives of Environmental education:

Environmental education also helps to achieve some objectives of the psychomotor domain, which covers the manipulative, or motor-skill areas. These objectives can be achieved through excursions, hiking, N.S.S., N.C.C., A.C.C., Scout and Girl Guide camps. Shramdan and Red Cross activities also come under the domain of psycho-motor objectives of Environmental Education.

1.4.4. GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION:

Environmental education should:

1. consider the environment in its totality; natural and built, technological and social (economic, political, technological, cultural, historical, moral, aesthetic);

2. be a continuous life-long process, beginning at the preschool level and continuing through all formal and non-formal stages;

3. be interdisciplinary in its approach, drawing on the specific content of each discipline in making possible a holistic and balance perspective;
4. examine major environmental issues for local, national, regional and international points of view, so that students receive insights into environmental conditions in other geographical areas;

5. focus on current and potential environmental situations while taking into account the historical perspective;

6. promote the value and necessity of local, national and international cooperation in prevention and solution of environmental problems;

7. explicitly consider environmental aspects in plans for development and growth;

8. enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences;

9. relate environmental sensitivity, knowledge, problem solving skills and value clarification to every age but with special emphasis on environmental sensitivity to the learner's own community in early years;

10. help learners discover the symptoms and real cause of environmental problem;
11. emphasise the complexity of environmental problems and thus the need to develop critical thinking and problem solving skills; and

12. utilise diverse learning environments and a broad array of educational approaches to teaching/learning about and from the environment with due stress on practical activities and first hand experience.

1.5. ENVIRONMENTAL EDUCATION (EE) AT DIFFERENT LEVELS OF SCHOOL EDUCATION:

Environmental issues attracted popular attention and it was felt that education had to respond appropriately to this urgent need of the time. The National Policy on Education – 1986 (renewed in 1992 p.36) stated “There is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of society, beginning with the child. Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire Educational Process” Accordingly, the National curriculum far Elementary and secondary Education: A Framework 1988 presented the NCERT’s view (p.6). “The school curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy.
The National Curriculum Framework for school Education (NCFSE) – 2000 also highlighted the need for including environmental concerns at all the levels of schooling. At the primary level, Environmental Education (EE) has been integrated suitably in social science, languages and science and technology. At the secondary levels, besides integrating topics related to environment in various subjects appropriately, conservation education and disaster management education have been included as potential subject choices along with traditional subjects.

It has been felt that although information about the environment is being given through textbooks, it has not succeeded to generate a concern that may lead to effective action for conserving and further improving the environment. Therefore, further course of study in EE should emphasize the emotional and attitudinal aspects of the learners personality along with the requisite cognitive component most of which is available in the different subject textbooks. Thus, it is argued, a value based, action oriented course of EE would lead from knowledge to feeling and finally to appropriate action. This has resulted in a demand for developing action oriented, value based course in EE for all the classes / levels of schooling in such a way that it addresses the general environment concerns without adding to the curricular load.
The scope of EE is broad based and encompasses physical, chemical, biological, social, cultural and human dimensions of study. All the dimensions are closely interrelated and influence one another. The themes, which emerge prominently, include interdependence of man and nature, ecologically and socially sustainable development, pollution and the problems it creates and the preservation and conservation of natural resources. The other themes that find a prominent place are population, human health, impact of science and technology, industrialization, culture, ethics, agriculture and economics.

The main focus of EE is to expose students to the actual world they live in. They have to be acquainted with the government related issues and problems. They must also be able to look at the environmental problems and concerns, analyse, evaluate, draw inferences and equip themselves to resolve them. To achieve this, the curriculum could be based on the three aspects.

- Learning about the environment;
- Learning through the environment - implying a systematic exploration through a variety of activities.
- Learning for the environment by developing a genuine concern for and sensitivity towards its protection and preservation.
In order to realize the above, the objectives of EE need to focus not only on knowledge but more importantly on generating awareness, developing attitudes, values, and skills, and promoting participation and action among children at all levels of school education. By complication, learning opportunities would not remain limited to the classroom alone but extend much beyond it.

On the issue of viewing EE as a compulsory subject with reference to the different stages of school education, i.e. elementary, secondary and higher secondary, the common consensus on the scope and dimension at each stage, as it emerged, is as follows:

- Elementary – Coverage be related to the child’s surroundings, health and hygiene along with suitable filed activities and observations.

- Secondary – Moderate exposure to various environmental concepts, plant and animal life, their interaction with the environment, pollution and other problems be given.

- Higher secondary – Greater exposure to all the topics covered at the previous levels be given and in addition some other topics could also be included.
Based on this learning outcomes expected at different stages of education would include the following:

**Primary stage : Classes I – IV**

- recognises common objects, plants, and animals in the immediate surroundings;

- acquires skills of observation, collection of information, classification, description and self expression concerning various phenomena of the environment;

- observes sample rules of healthy leaving, safe storage of food and water and practices proper ways of waste disposal;

- develops habits for protection of the self and surroundings;

- expresses love for the environment through drawing, painting, dancing, singing, gardening, tree plantation and other activities;

- takes care of and shows concern for all living beings;

- develops attitudes desirable for conservation of environment; and

- imbibes values like love for nature, respect for rights of animals, care of plants and other living beings and protection of the environment;
Teachers may innovate and design activities suited to their own surroundings and the level and interest of children.

**Upper Primary Stage : Classes V – VII**

Understands facts and concepts concerning various aspects of the environment; recognizes dependence of human life on environment; identifies local and region specific environmental problems; understands the role of individuals, society and the government in protection, preservation and conservation of environment; develops awareness about rules, regulations and legal provisions for protection, preservation and conservation of the environment; develops skills of observation, collection, comparison, classification, analysis and communications; makes judicious use of resources; adopts proper ways for management and disposal of waste; develops awareness, desirable skills and attitudes and appreciation for the protection, preservation and conservation of the environment and cultural heritage; and imbibes values like love and respect for nature and its laws, respect for the rights of other including animals.

The content of EE will have to be further strengthened in its cognitive, affective and conative components by providing additional inputs in the form of investigations, projects, co-scholastic activities.
This will facilitates development of necessary awareness, attitudes and skills for promoting positive participatory action.

Teachers may design their own set of activities keeping in view the overall objectives of teaching and learning of EE at this stage. They will have to make use of the available resources and facilities and take cognizance of local environmental problems. The learners should be encouraged to initiate action on their own.

The teaching – learning strategies for EE at the respective stages are to be designed in keeping with the local environmental conditions, both natural and social. At the same time, it should also aim at helping learners to develop a global perspective of the environment and problems related to it.

Regarding the introduction of EE at different stages of school, two separate approaches have emerged. The first one is about an integrated approach where teaching of environmental concerns and challenges becomes a part of science, social science, mathematics and other subjects. The second approach refers to EE as an interdisciplinary area and as a compulsory subject. This model lends a more definite shape and structure to the subject.
Introduction of EE as a compulsory subject would require reformulation of curriculum, in other subject area also. It would be necessary to avoid repetition, excess information and increase in curriculum load.

In addition, EE could also create opportunities for the learners to think, plan and act, and share responsibilities. Such opportunities be provided in the daily schedule of the school as well as in the activities
organized specially for EE. It needs to be made interesting and value added with homework for students to carry.

At the primary level, maximum use of school and home surroundings as well as other settings needs to be emphasized in order to promote awareness and appreciation about the local environment. At the upper primary level children’s participation in simple projects related to different environmental issue and problems has to find an important place. At the secondary level, children need to be introduced to real life situations and opportunities for community based environmental action. The schools may set up eco clubs, health clubs and conduct cleanliness drives, nature study camps and field visits. At the higher secondary level, there is a need to move into real life settings where environmental problems are a reality and action through extension work in groups leading to improvement in the environment is to be initiated.

1.6 Role of Teacher in Environmental Education

Traditionally a teacher has been regarded as an agent of social change and modernization. He has been called ‘The maker of history’ ‘The builder of the nation’ and ‘The social engineer’ the teacher plays a crucial role in the process of education, a great deal would depend on teachers role and performance in achieving the objectives of education.
The role of teacher is to help the children as well as illiterate adults to know, to protect and to enrich their environment. Children emulate their teacher and draw inspiration from them. A teacher therefore, plays an important role in producing environmental awareness and developing a positive attitude towards environment among his students. Teachers would find it as an urgent need to educate about the environment and to be able to convince the students and society about the environment and be able to convince the students and society about the urgency of environmental protection only if they themselves are adequately aware of it and have a positive attitude towards environment. The teacher should tell students the fundamental duties of Indian citizens with regard to environment as incorporated in Article 51 part IV-A of Indian constitution, “to protect and improve the natural environment including forests, lakes, rivers and wildlife, and to have compassion for living creatures”. The teaching methods which can be used by the teacher in a formal system of education to integrate the environment component with education are role-play, discovery method, observation method, dramatisation, story telling, games and puzzlers, project method educational visits and excursions. Also conferences, workshops, seminars, symposia, projects, group discussions action research and research projects can be used at higher levels of education. Educational excursions and visits can be organised to study a chosen natural area, the
culture of a city or town, the wildlife, flora and fauna of the natural area. The natural trials, cultural trials and zoo visits, etc will help the children to gain first hand knowledge of environment. Beyond the classroom, the cocurricular activities can also be utilized in the form of debates essay writing competitions, posters preparation slogan writing competitions, quiz competition wall magazines news bulletin, etc on the topic related to environment.

**Specific role of teachers**

The role of a good teacher does not end with teaching alone as far as EE is concerned.

Following are certain roles which he has to fulfill;

- He should be a friend, guide, philosopher and should motivate the students to take active part in environmental protection measures.
- EE is more an outdoor activity therefore teachers should plan his/her lessons with methods like exploratory and heuristic methods which will enable them to explore nature. The teacher should device teaching strategies involving environmental as component. His activities should not be confined to the classroom alone, local environmental issues should be discussed and children should be made to think in that perspective.
- Teacher should create feeling of togetherness and positive attitude towards environment.
• Teacher should promote dust bin culture to be followed at various places like bus stand, railway station and other public places.

• The teacher should channelise the energy of the students to create an atmosphere free of pollution

• The teacher she/he can ask students to campaign against the use of plastic carry bags and implement the habit of using alternative of plastic in day to day activities.

• Teacher should plan the environmental activities co-related with the customs and traditions of the society.

• Water enters the rivers and ponds during August and September seasons vinayaka chaturthi, coloured idols of Ganesha are merged in waters. Teacher has to choose this occasion to campaign against water pollution during this period. In the same way campaign against sound pollution in the month of November in which the Deewali is celebrated, in which crackers are the cause of sound and air pollution.

• Monsoon is the period in which most of the viral diseases spread. At this time teacher has to educate students to maintain healthy surrounding and healthy habits which prevent such diseases.
• Teacher should direct each student to plant a tree on his (or) her birthday every year either in school (or) elsewhere and nurture its growth.

• He should conduct field visits to industries and polluted areas to enable the students to feel the need and importance of environmental protection.

• He can ask students to take up projects like rain water harvesting, recycling, building of nests, making decorative items from waste, survey of plants, survey of utilization of energy resources.

• Celebration of important days relating environment viz, World Forest Day, World Population Day should be made a practice.

• Teacher should make it very clear to every child that he is a part of the environment, and if he protects the environment, the environment will protect him other wise, every one has to face the repurcussions. The teacher should sow the seeds of sustainable development in the young minds.

• He should inspire the children, and give training as soldiers for environmental protection.
1.7. EE in Teacher Education:

The teacher plays an important role in shaping and moulding the habits, manners and good character of children. Therefore to promote environmental awareness programme, it is essential that teacher should have sufficient knowledge of EE. It is the responsibility of teacher training college and universities to groom teachers this task also. Both international and intergovernmental organizations and agencies have recognized the urgent need to develop EE in teacher Education programme. This has been documented in many conferences, such as international union for conservation of Nature and Natural Resources (IUCN), Environmental Education conferences (1971) Belgrade Workshop (1975), The Tbilisi conference (1977) and more recent United Nations on Environmental Development, the Earth Summit (1992). the UNESCO – UNEP international environmental education programme has described the teachers as “the priority of Priorities” for action to improve the effectiveness of EE (1990).

The Tbilisi conference Report recommended the following points on the training of personal in EE

- Environmental Education should be included in the curricular for pre service teacher education.
• The staffs of teacher education institutions should be educated in these respects.

• The implementation and development of inservice training, including practical training in environmental education should be made in close cooperation with professional organizations of teachers.

• Teachers and learners should be involved in preparation and adaptation of instructional material of EE.

The Tbilisi conference recommends that teachers in formal education, organizers in non-formal activities for young people and adults, administration personal and educational planners and instructors should be familiarized with environment linked subject matters.

Teachers training programme in environment education should focus on development of knowledge, skills and attitudes concerning, environment, its issues and problems and development of competences in the teaching and supervision of the activities related to EE.

The fact that there is a need for teacher training in EE and has been emphasized many times. This is due to the fact that EE is basically interdisciplinary and applied in nature. The objectives of such a training programme may be as follows:
1) To improve the existing environmental awareness of the trainees.

2) To provide training in identifying local environmental problems and to make their systematic study.

3) To provide in depth training in dealing with a new environmental problems.

4) To provide training in dealing with environment issues in the class by (a) translating the implications and (b) developing environmental awareness.

The effective implementation of EE required large number of teachers which are knowledgeable and skillful to deal with EE in a meaningful way this would also require the training to handle child centered and activity based curriculum.

A general need for properly and adequately trained teachers for all the stages of school education in order to achieves the objectives of the subject does exist as teachers role is pivotal in imparting EE. To realize this, the curriculum of teacher education needs to provide the basis knowledge and conceptual understanding of EE as well as to develop relevant skills and attitudes in student-teachers and the existing cadre of teachers.
The basic strategies required for strengthening both pre service and in service teacher education programmes include;

- Reviewing and modifying the existing pre service and in service education programmes in view of the need for making EE their integral part and proceeding theoretical and practice inputs specifically focusing on environment related issues and concerns;

- Familiarizing teachers and student-teachers with planning, organizing and conducting of projects activities, and case-studies in environmental education and enabling them to generate desired action amongst tearners;

- Providing exposure to different kinds of projects already in progress in the community;

- Developing skills to establish closer school community contacts;

and

- Using co-scholastic activities in other subjects as a medium of teaching environmental education.

The school curriculum in Karnataka State from classes I to IVth has made provision for the study of Environmental Studies based on the guidelines issued as a part of National Policy Education (NPE) 1986 with
effect from 2001 to 2002 throughout the state. Hon’ble Supreme Court of India in its historic judgment in the year 2004 has directed the states to make Environmental Education a compulsory subject in schools at this levels. In the light of this judgment and direction given by Supreme court, National Council of Educational Research and Training (NCERT) has prepared a model syllabus of EE for the implementation throughout the country. The government of Karnataka has adapted this NCERT syllabus. The course aims at creating awareness to the local environment among children, among young learners, the problems associated with it and the necessary skills for solving these problems and moving towards a life of perfect harmony with their natural and social environment.

The text books of classes I to IVth have been revised and restructured for the year 2005-06 based on the NCERT syllabus and based on the children’s learning levels, attractive, activity based textbooks have been written.

However from classes Vth onwards the Environmental Studies as a separate subject has no place in the school curriculum. But all the teachers while teaching their regular subjects should integrated environmental concerns in such a way that children should evince keen interest in Environmental related matters.
In order to fulfill the requirement, it is very essential that the teachers at that level (elementary) should be equipped well with environmental knowledge, awareness and right attitude towards environmental protection.

1.8. CONTEXT NEED AND SIGNIFICANCE OF THE STUDY

The term environment retains eleven letters in its structural set, which reveal the significance of the quality of environment; the cause of its degradation and the remedies to solve the problems of environment for sustainable development. The letter wise abbreviation meaning of these phrases can be elaborated as under.

E : Energy generation for all the living organisms of the earth.

N : Nursing the free gifts of nature for better quality of environment.

V : Valuable properties of nature not to be exploited recklessly

I : Increased and uncontrolled deforestation products and plundering of renewable natural resources, a crime against environment.

R : Regular and righteous assessment of negative impact of implementation of any scheme of economic development on environment.

O : Over-use of pesticides, chemicals and fertilizers giving slow poison to the surrounding of environment.
N : Nuclear explosion an infamous factor to the contours of environment.

M : Mobilisation of mass awareness for protection and conservation of environment by the government and the voluntary organizations.

E : Environment sanitation and proper disposal of garbage.

N : Non equity of all kinds of pollutions desirable for ecological balance.

T : Towards a sustainable development.

The first 2 letters: EN emphasizes the basic significance of good quality of environment, the next five betters VIRON denotes the main causes of suffocation of polluted environment and the last four letters – MENT represent the compendium of policy recommendations to keep eco system more balanced and healthy.

A sustainable way of life calls for reorientation of our production systems and consumption pattern so that development can be economically efficient and ecologically sensitive. This calls for a radical change in the way we think, live and work. It therefore goes without saying that sustainable development calls for a paradigm shift in our educational system right from school level to university level. In fact, it cannot be thought of achieving sustainable way of life without an appropriate
educational system designed to internalize the principle of sustainability in the life of work of our youth.

Our youth and children represent the new century and they are the architects of the country’s future. Hence it is very important to note that environmental education started at school level will have to become, over a period of time, a way of life. EE should not only create consciousness and be translated into coherent behaviour in which collective action finds a fundamental solution for the problems related to environment. The basic need of every individual is healthy and pure environment to lead a healthy and happy life. Good environment is not just the matter of today’s need.

As long as the life exists on this earth there is need for good environment. Our striking fact is, if once any damage occurs to its natural setting it can not be brought back to its original form at any cost and any efforts.

The role of education in understanding, protecting and solving problems related to environment has been realized all over the world since 1970. Evidence to this are the number of conferences, seminars and workshops held on the theme at the National and International level and the efforts made by different countries in introducing environmental education perspective at all levels of education.
In last few decades the economic, technological and ideological force that brought about the modernization and industrialization had an impact on both developed and developing countries. The existing model of development has exerted four negative effects on environment erosion of biodiversity, global warming, ozone depletion and toxic pollution.

The process of development is viewed as an indispensable tool for fulfillment of needs of the human beings. The world has already lost one fifth of the top soil from its crop land, the forests are being decimated to an extent of one lakh acres every year. Innumerable plant and animal species are being extinguished. Dead lakes and dying forest have become natural accompaniment of industrialization. The protective ozone layer has been depleted. More than two million tones of carbon monoxide and more fifty million tones of various hydrocarbons are being pumped into the atmosphere and also sulphur dioxides are discharged into sky. High concentration of gases and chemicals in the atmosphere has led to depletion of ozone layer, which protects us from the harmful ultra-violet rays of the sun.

The toxic chemicals ingested in by breathing polluted air are believed to increase disorders of the liver cause neuropathy, intestinal pneumonitis chronic kidney disorders, diabetics, hypertension, atheroma
of blood vessels, skin cancers, cataracts allergies and several other ailments.

Keeping in view above all mentioned hazards, every individuals should be aware of what is happening and what should happened and our action behaviour towards it. So every educational policy is stressing the need on EE both at secondary and tertiary education level, which in turn leads to environmental awareness environmental attitude and environmental action behaviour.

Realizing the importance of EE, the National Policy on education (1986) emphasized that, there is a paramount need to create a consciousness of the environment. It must permeate all ages and all sections of the society, beginning with the child. Hence EE is considered very important at all stages of education to restore the quality of environment and promote sustainable development.

Also it is generally considered that elementary school occupy a pivotal position in fastering right kind of values and sentiments regarding environment among the school children. This will be done effectively only when school teachers are trained thoroughly in the art of teaching school children especially on matters related to environmental education. This is possible only when elementary teacher trainees are thoroughly exposed/trained in the area of environmental education to get proper
awareness, attitude and desirable behaviour towards environmental issues.

Training of teachers at elementary stage occupy a pivotal place in the educational chain of the total education system. In the D.Ed course of Karnataka State Ist year students will have content enrichment programme of 2 months duration in which they are exposed to Science, Maths, English Kannada and Social science subject. Surprising that they do not have environmental education in the above said list. A perusal of 2nd year D.Ed syllabus also revealed that EE as a subject no place here also. But it is a paradox that these trained teachers are expected to integrate environmental components into the regular curriculum in the schools where they work. This evinced interest in the investigator to study elementary “Teacher Trainees” environmental awareness attitude towards environment and action behaviour towards environmental issues and thus the present study has been taken.

The teachers at elementary level shall try to acquaint and sensitize the young minds to the environmental inspects to inculcate in them healthy personal and social habits and behaviour towards environment. This demands proper training/exposure to pre-service/in-service teachers to have environmental awareness/knowledge, positive attitude and values, which influence their behaviour/action towards environmental
protection. Thus, an attempt has been made here to study pre-service trainees awareness attitude and action behaviour.

A thorough of review of research study related to teaching EE revealed that considerable research has been done on different aspects of EE with different variables but only a few studies have been carried out to measure the existing levels of awareness, attitude and action behaviour related to environment among teachers and students at different levels of education. Further, it is found that studies on the level of environmental awareness, environmental attitude, and environmental action behaviour of primary teacher trainees and factors influencing them are sporadic. Thus it is felt that there is a strong need for the present study.

It is also observed that many of the research study have attempted to study environmental awareness and attitude in relation to certain variables like sex, subject studied qualification teaching experience etc., some studies have reported the difference in the awareness and attitude between different categories on the selected variable, some reported no difference. Thus finding of those studies are found to be inconsistent and therefore in this study attempt has been made to select those background variables (sex, subject studied, qualification, teaching experience, academic achievement parental education occupation and income) and study the difference in awareness attitude among the teacher trainees categorized on the respective variables.