CHAPTER-II

THEORITICAL FRAME WORK
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### THEORETICAL FRAME WORK

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2.0 INTRODUCTION:

Our mounting concern with the environment is not just for ourselves, but also for the entire mankind now existing and the generations to follow. This agreed that children are the nation’s greatest resource and the future of civilization depends on them.

There has been sudden increase in the activities for environmental education (EE) during the last two decades. This has resulted in the development of different kinds of curricula, out of school activities and literature. The purpose is to regenerate man’s interest in preservation, conservation and improvement of the environment before it is too late and reaches the point of no return.

EE has been perceived differently by various educationalists and thinkers. They differ in its objectives, the kinds of activities that are used to achieve the objectives and resources to attain these ends. It is the vastness and variety of the area of EE that necessitates to take a holistic view of the various aspects of EE.

This will help us to see its strength and weakness and draw conclusions for the future. The purpose is to make a review of the situation in this context and examine different roles played by E.E. at school level and see how these are achieved. Moreover, it is of interest to see how EE is molded in different circumstances such as those present in the wide spectrum of developing and developed countries.

2.1 ENVIRONMENT & EDUCATION - THEIR CONCEPTS & RELATION:

Relation between Environment and Education:

Environment is described as “a system that includes all living and non-living things like air, water, soil, vegetation, flora and fauna. While P.Gisbert defines environment as anything immediately surrounding an object and exerting a direct influence on it”. T.D.Elliot regards it as the field of effective stimulation and interaction for any unit of living matter. The concept
of environment also covers the concern to protect wildlife and plants, the preservation of landscape and monuments or buildings and, of course, the frightening growth of all types of pollution. Besides, it also includes the economic growth that raises problems of resource conservation and waste disposal, particularly the disposal of plastics, chemicals and atomic waste.

Education is defined as the process of development and Environment is the aggregate of the external conditions and influences affecting the life and development of man and other living organism. Ever organism has its own environment. Man's environment consists of natural as well as socio cultural environment. Education can change and improve the quality of man's environment for desirable modification of his behavior.

Bernard has illustrated the relationship of environment and education. The educational process of development is organized formally in the classrooms of educational institutions, where an interaction takes place between teacher and taught. A teacher performs certain activities verbally & non-verbally to generate conducive social and emotional climate to provide the new experiences to his students for desirable changes and modifications in their behaviors, thus - process of development takes place in schools. The organization climate and health of the institutions also provides new experiences to their students. Thus educational process of development occurs in physical, social, cultural and psychological environment.

Education deals with the various problems and principles developed by relationship between students and their environment which is created by school and teacher formally and informally. Similarly ecology is a new science which deals with the various principles which govern the relationship between organisms and their environment. Thus education may be termed as 'Human Ecology' which deals the relationship of man and material in context of growth and development.
2.2 NEED, IMPORTANCE AND PURPOSE OF ENVIRONMENTAL EDUCATION (EE):

Need for Environmental Education:

The concept and term “Environmental Education” is very new and latest but it has very ancient roots in our culture.

Rigveda is the oldest of all four Vedas. It has been stated in the Rigveda “The dust (dhula) of mother earth and light of father sky should remain be associated with full brightness for our welfare.” According to Rigveda, there are three kinds of God - the celestial, the aerial and terrestrial i.e: land, air, and water.

Brihaspati is most important, means awareness of these mandals. The whole Brahmanda was full of peace and happiness because life and environment were so closely related that it was difficult to think man and organism as some thing separate from nature or environment.

In present situation, Man and Environment are considered interrelated and there is interdependence in them. The nature or environment becomes a source of sorrow and in happiness, because the dust of earth, light and air of sky have the adverse effect on human beings. Therefore, it widely recognizes the need of introduction of Environmental education.

Our country has accepted the need for the environmental education with the recommendations of the Tiwari Committee (1980). Many people recognize an urgent need for environmental education, besides introducing the subject of “Environmental science” at all levels of education. We must give much emphasis on the new approaches and programs of environmental education, thus the idea is to bring environmental concerns to all facets of life.

Most people recognize the urgent need for the environmental education, but some have clear ideas about what needs to be done, and very few, have either the actual experience or the knowledge about the course that need to be taught. The chief object of Environmental Education is that individual and social groups should acquire awareness and knowledge, develop attitudes, skills and abilities and participate in solving real life environmental problems. The perspective should be integrated, inter
disciplinary and holistic in character. The lay public in rural, tribal, slum and urban areas, women, students and teachers in schools, colleges and Universities as well as planners and decisions and policy makers, program implementers and workers need to be educated about the environment.

The need of EE has been thoroughly discussed at several national and International seminars, workshops and conferences. After the deliberations at Foureex in 1971 and at Stockholm in 1972, an International workshop was held on environmental education. "The Belgrade Charter" at Belgrade (Yugoslavia) in 1975 organized UNESCO and later an Inter Governmental Conference on EE (UNESCO, UNEP) at Tbilisi, USSR in 1977. Belgrade workshop formulated the guiding principles to achieve the objectives of Stockholm conference, whereas Tbilisi conference followed closely the footsteps of Belgrade workshop.

In a national seminar, organized by the Indian environmental society in collaboration with the international program on environmental management at the Indian National Science Academy, New Delhi in 1979, emphasis was given to incorporate Gandhian thought and values as a part of environmental education. A number of recommendations were made in the seminar.

On the occasion of the First International Conference on Environmental Education held at New Delhi, in 1981 the late Mrs. Indira Gandhi observed that EE is to help arouse social consciousness and make community aware of the fact that the good of the individual and that of the community are both harmed by ecological disruptions. In 1985, there was the Second International Conference on EE at New Delhi. Several important points could emerge from the deliberations of the International, Regional, National and even local conferences on EE.

Some form of environmental pollution affects each and every nation though the issues differ. Environmental issues differ from developmental issues in their impact upon individual lives. Environmental stress may or may not touch people's lives in ways which are conscious and about which they can protest, but they are always the sum total of living things, the biosphere. Acid rain, desertification, global warming, ozone layer depletion, pollution of air, water and soil, radioactive contamination of large areas, and species
extinction are some of the most urgent environmental threats to be dealt with now and in the future. These problems are serious, interdependent, and characterized in most cases by a dimension in space and time.

For more than twenty years, the educational institutions of the world have been making intense efforts to meet the challenges arising from politics, science and public opinion towards integrating environmental concerns. A popular slogan of the international ecology movement is “Think Globally and Act Locally.”

Today, environmental education is an important segment within the educational system. In some countries, it also constitutes a political-pedagogical action programme to be developed and pursued by social groups, government, the scientific community and educational institutions. This programme includes all educational activities consciously confronting and attempting to overcome the environmental crisis.

It is a programme with the following aspects:

- Goals, concepts and components of the specific educational measures.
- Relationship between environmental crises and environmental education.
- Subjects, teachers and pupils.
- Target groups.
- Local environment
- Educational institutions.
- Conditions, access and participation.

Environmental learning is learning about the factors, causes and solutions to environmental crises. Learning about the environment is immediate reaction to concrete problems in management of natural resources. Present civilization finds itself in a state of development in which environmentally responsible behaviour is no longer the norm and the daily routine, unlike the traditional societies. Such behaviour is no longer learned and internalized naturally but must be taught consciously. There are substantial breaks with traditional habits, which at time, of course, become unavoidable.
Programmes for environmental education possess not only a fundamental pedagogical guideline and a precise educational task, but also a standard for evaluating its own success or failure. The ultimate test for such education lies in the effect that it has in real life, that is outside the pedagogical domain in overcoming the environmental problem.

Environmental education seeks to develop:
- the ability to assess environmental situations and the causal chain of relationships leading to environmental damage;
- the interaction among social, economic, and physical factors;
- mutually related and overlapping developments, networks and feedback;
- responsibility for the future generations;
- economy and care in the use of natural resources;
- respect for nature and life;
- recognition of the limits of nature, human action and self-restriction;
- and acquiring an ability to perceive nature.

Environmental education aims at ultimately far reaching and manifold behavioural changes in everyday life and workplace. The guiding principle and pedagogical ideal of environmental education is the environmentally responsible consumer, industrial producer, employee, citizen, policy-maker, traveller, athlete, tourist and the farmer – every individual who is aware of nature and lives in harmony with it.

As environmental education take place in different settings and not necessarily in the formal classroom, the teacher should consider how the setting itself could be used in the teaching process. In fact, environment is one of the key elements of a teaching-learning exchange.

**Importance of Environmental Education:**

Over recent decades, global problems relating to degradation of natural resources and pollution have increased dramatically. Natural resources are depleted by excessive use. fresh water scarcity on a global scale, deforestation, degradation of coastal and marine areas, soil depletion and loss of biodiversity, are some of the problems that have become a cause for concern. Air and water pollution has reached levels that are already resulting in serious
health problems, as well as a negative impact on the environment, and inevitably influencing prospects for long-term economic growth. In such a scenario, the importance and need for environmental education can hardly be stressed. In fact, sustainable development or economic development without affecting the natural resources should form the cornerstone of environmental education.

The concept of sustainable development holds the vision of a more equitable world. This can be achieved by providing the disadvantage with the means to advance themselves and their families. One of these means, of course, is environmental education.

As universal literacy is still a distant dream, orienting environmental education towards sustainable development alone is not enough. Attention also has to be given to those who are at present not served or are poorly served by schools. This is a large group, well over a billion people and a vital one for the future. Girls and women, the mothers of today and tomorrow, are in the majority. They are, or will be, the first and most influential teachers of their children.

Environmental education is both valuable and necessary. Starting from a very young age, children should be taught about the environment that surrounds them. As these children grow, their environmental awareness and knowledge of the area in which they live should also grow. Their education should be integrated with core disciplines.

Environmental education provides the foundation for all future education and learning. It can produce children who are not only happy but are also happy with others, find learning exciting and develop enquiring minds. Environmental education enables children to develop a storehouse of knowledge about the world and seek knowledge that they can use and develop throughout their lives. Environment education empowers adults by enabling them to participate in a sustainable future. Environmental education thus lays the foundation for a lifelong learning.
In effect, the importance of environmental education can be stated as follows:

- It is essential for the self-fulfillment and social development of the child and the adult.
- It is essential for understanding the different food chains and the nature's ecological balance.
- It plays an important role in understanding and appreciating how the environment is used for making a living and promoting material culture.
- It enables one to appreciate and enjoy nature and society.
- It inculcates a concern for the systematic change of environment for the distant and the immediate welfare of mankind.
- It makes one conscious of the problems of population explosion, depletion of natural resources, global warming etc.

Purpose of Environmental Education:

The main purpose of EE is to acquaint and sensitize the young minds to the environmental problems and concerns, to inculcate in them healthy personal and social attitudes and behaviour towards environment. This will enable them to initiate work for its sustainability individually and collectively taking together peers and community.

The main focus of EE is to expose students to the actual world they live in. They have to be acquainted with the environment 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 common 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 pursuance of the responsibility entrusted by the Hon'ble Supreme Court of India to the NCERT to prepare syllabus of EE for the different stages of school education, an Environmental Education Group (EEG) was specially created in the Council on 24th December 2003. The first logical step taken by the EEG was to analyse the existing school syllabi and textbooks from the point of view of EE. Subsequently, the EEG reviewed the literature on EE available in the field like books, awareness and instructional materials, research publications and various reports. The related literature available on internet was also reviewed.

The NCERT, with a view to utilising the vast experience, wisdom and expertise available in the country, approached a large number of individuals and institutions actively engaged in promotion of environment and EE in different parts of the country. They were requested to give their comments and suggestions and also the material produced by them or available with them on the major issues concerning environment and EE. These issues included:

1. Scope and dimensions of EE at elementary, secondary and higher secondary levels of school education.

2. Modalities of introducing EE without increasing curriculum load.

3. EE as an instrument for inculcating healthy personal and social attitudes towards environment and development.

4. Role of community in imparting effective EE in schools.

5. Significant elements of the content and process including projects and activities for EE.

6. Strategies of evaluating EE and its place in public examinations and

7. Implications of EE for teacher education.

Comments and suggestions were sought from all the constituent units of the NCERT, viz., departments of the National Institute of Education (NIE), the Central Institute of Educational Technology (CIET), the Regional Institutes of Education (RIEs) at Ajmer, Bhopal, Bhubaneswar and Mysore, and Pandit
The RIEs conducted a class-wise and subject-wise review of the content of EE in school textbooks in use in their respective states, viz., Rajasthan, Madhya Pradesh, Orissa and Karnataka, for the content of EE which provided useful inputs for drafting the intended syllabus. In addition to inviting suggestions from the field and holding internal consultations and discussions within the Council, the NCERT invited some eminent educationists and scholars to interact and provide suggestions for formulating the intended syllabus.

The entire input received from the consultation and discussions, was closely analysed at the NCERT internally to draft the syllabus of EE for different stages/classes of school education. The direction emerging from the analysis clearly indicated that the teaching of EE should ultimately lead to the inculcation of a sense of duty and awaken the conscience and feelings of young children to protect, preserve and improve the environment through positive action.

The NCERT has the experience and expertise in the area and has incorporated EE in its Curriculum Framework for School Education and the corresponding syllabi published in 1975, 1988 and 2000. This was fully utilised and the syllabus for EE was drafted incorporating the experience and the feedback received from the experts in the field and was reviewed in the national consultation meetings.

With a view to identify the contents of Environmental Education (EE) in schools, textbooks being used in the states of Rajasthan, Madhya Pradesh, Orissa and Karnataka were reviewed by the faculty of the four Regional Institutes of Education (RIEs) situated at Ajmer, Bhopal, Bhubaneswar and Mysore. These institutes are well familiar with the development and changes in the curricula and text materials not only in these states but also in their respective regions. In addition, textbooks developed by the NCERT were also examined.

A common approach was evolved through internal discussions among the faculty at the NCERT in Delhi, in the four RIEs and at Pandit Sunderlal
Sharma Central Institute of Vocational Education (PSSCIVE) at Bhopal. The review was conducted in relation to four stages of school education, namely, primary, upper primary, secondary and higher secondary. Content and suggested activities for EE were identified and examined. The main focus was on the coverage of EE concepts and the depth of their treatment. The continuity of the content across the four stages was also studied. This was ascertained by examining the concepts included in textbooks in different subjects along with the activities for their potential in providing knowledge and skills necessary for dealing with environmental issues. It was noticed that the concepts most commonly dealt with were associated with man-nature relationship in terms of basic components like water, air, soil, space and energy. It includes eco-system, conservation of natural resources, biodiversity, biotic community, wildlife, deforestation, pollution, soil degradation, acid rain, greenhouse effect, ozone layer depletion, bio-energy, population, food and health, disaster management, management of domestic and industrial wastes and detection of leakage of Liquefied Petroleum Gas (LPG).

Environmental concepts also extend to subject areas like languages and social sciences which reinforce learning and internalisation of all such concepts. The NCERT textbooks of 'science and technology' and integrated 'social science', however, provide a wide view of EE, highlighting various environmental problems and suggesting a variety of projects and community related activities to resolve environmental issues.

The concepts of EE have been provided in the secondary level textbooks of science and social sciences in the states of Rajasthan and Madhya Pradesh. In Orissa, there are three textbooks, namely, Science Part-I (Physical Science), Science Part-II (Biological Science) and Geography, while in Karnataka, one textbook deals with science (physics and chemistry), the second with science (biology) and the third with social sciences. The textbooks deal with environmental concepts both at concrete and abstract levels.

In order to ensure an extensive and thorough discussion on the draft syllabus prepared and on certain major issues crucial for the introduction of
EE in schools, a two days National Consultation Meeting was organised in the NCERT on 13-14 February 2004. The deliberations were centred around the above mentioned issues. Eminent experts, environmentalists, educationists, teachers, university departments, institutions (governmental and non-governmental) working in the field of environment and EE participated in the meeting. Based upon the recommendations received, the draft syllabus of EE prepared by the NCERT was thoroughly revised in consultation with the core group.

With a view to proposing an effective implementation strategy, second National Consultation Meeting for one day involving the Directors of SCERTs and Chairmen of Boards of School Education was organised on 13 March 2004. The major issues deliberated upon in this meeting were:

- EE in school curriculum: its place in relation to other subjects in terms of weightage, time allocation and teacher preparation
- Strategies of evaluation
- Management of implementation : Provisions and mobilisation of resources, monitoring and supervision, support system and networking

The recommendations of this group were further utilised to improve the draft syllabus. The draft so prepared was further fine tuned and finalised with the help of internal and external experts for submission to the Hon'ble Supreme Court.

The implementation of the proposed curriculum and syllabi of EE needs to be considered in an all-inclusive manner. The syllabi, developed with the age, mental level and the local environmental context of the students in view, have a systematic and graded progression for ensuring continuity as well as opportunities for revisiting and practising certain concepts following a spiral approach. Effective implementation of the proposed curriculum of EE will depend on:
• a comprehensive understanding of the curriculum and syllabi for EE among all the stakeholders,

• motivation and commitment for achieving the objectives of EE in larger social interest,

• availability of relevant and useful materials, both for students and teachers,

• effective pre-service and in-service teacher education using face-to-face, distance and self-learning modes,

• active and meaningful involvement of parents and community in general

• adequate and appropriate resource mobilisation and management,

• meaningful networking among school, community, non-governmental organisations, media and government,

• effective participatory monitoring,

• regular renewal/updating of curriculum based on proper feedback and new frontline areas of knowledge and

• due recognition of the indigenous traditions and cultural practices related to the environment.

The following deserve systematic consideration in the process.

Strategy:

Availability of both human and material resources and their proper management would be crucial to achieving the goals of EE. The real spirit behind the introduction of EE as compulsory subject in schools has to be understood by the teachers. No separate set of teachers would be required to handle the subject. Every teacher would act as an EE teacher. The curricular materials already available in the system could be used for providing
necessary content input as well as the desirable experiences to the learners. Besides, additional materials need to be developed for use at all levels in order to meet the additional requirements of the EE curriculum.

At the secondary stage the concerns will have to be dealt with in two ways. First, the study of logical relationships, problems and consequences will constitute the transaction of EE for maintaining continuity on the one hand and generating awareness on the other. Secondly, children's interest, creativity and skills will have to be nurtured through individual and group projects, organisation of activities by children and their attempts at finding solutions to their day-to-day problems. The teacher is expected to be only a guide and facilitator in these. The culture of working independently would result among learners in a greater sense of responsibility and ability to show empathy and concern towards the environment around them. Consideration and love for nature would be strengthened by this time. The criteria for ascertaining the level of achievement of the goal in EE would be focused in their actual performance and social and interpersonal conduct rather than the sole memorisation of facts, information, principles and statistics.

Curriculum Load:

The apprehension that the introduction of EE as a compulsory subject would result in added curriculum load is not quite real. At the primary stage environment already happens to occupy an independent place because in Classes I and II all that a child reads and learns is built around its immediate environment. In Classes III-V, environmental studies is an independent and compulsory subject.

At the upper primary and secondary stages, however, the number of subjects prescribed for study would increase by one when EE is included as a compulsory subject. But this inclusion does not add to the actual learning load. The curriculum load in the area of integrated social sciences from Class VI to X has been substantially reduced as per the National Curriculum Framework for School Education (NCFSE) 2000. In the place of three or four separate books for one subject, now the students have to read just one. Moreover, there will be stress on the transaction of syllabus through projects, activities, group
work, group learning and the like. In view of this, the actual load on the student would not increase. This factor notwithstanding, effort will have to be made, during the next exercise of curriculum review, to carefully remove repetition, overlap and obsolescence in subjects like science/science and technology and social sciences. That will reduce the learners' load further.

**Monitoring:**

Translation of syllabi into the learning outcomes of children involves a large number of processes characterised by person-to-material and person-to-person interactions. All interpersonal interactions need to take place in an environment of mutual understanding, trust and sense of responsibility and, above all, a desire for achieving something good (health and happiness) for humanity and improvement of the surroundings. Success of any programme depends on its implementation in which monitoring of the planned activities and their execution plays a significant role in achieving the desired results. It applies to implementation of the syllabi of EE as well.

Monitoring provides an opportunity for improvement in planning, implementation, feedback strategies and evaluation procedures. Its coverage would include assessment of progress in development of materials, the availability and delivery systems, teacher preparation programmes, classroom processes, the co-scholastic activities, assessment of pupil performance and the like. It becomes all the more important to evolve strong monitoring mechanisms to achieve the desired results in terms of necessary awareness, knowledge, skills, habits, attitudes and values inculcated among the students following the proposed curriculum of EE at various stages of schooling.

The existing machinery of education will have to be made "environment conscious" and committed to realise the goals of the proposed EE syllabi. Roles and responsibilities would need to be delineated for personnel at different levels of educational administration. A clear awareness of the shift from mere cognitive understanding to acquisition of desirable behaviours reflected in practice may be emphasised. A system of participatory monitoring will need to be introduced from national to the grassroot level. The purpose of
such monitoring would be entirely different from mere mechanical supervisory practices and would be focused on qualitative improvement.

It needs a special mention that the monitoring system would be particularly effective if it carries with it both positive and negative forms of incentive. Above all, timely and thoughtful recognition and appreciation and, if possible, even reward would go a long way to strengthen the implementation of the EE.

Networking:

Since the EE syllabi will have to be implemented at all levels of schooling nationally, both linkages and networking among various educational and supportive systems and sub-systems will have to be strengthened. All state governments would need to constitute task forces for the purpose which would develop appropriate strategies for implementing the EE curricula and syllabi. Orientation programmes for all categories of personnel involved would have to be planned and organised. Development of teacher education curriculum and the materials needed for the purpose would assume a very high priority. Use of ICT and media, especially the electronic media, may be made in full to cover all teachers and teacher educators at all levels in all regions. The task forces would help the states decide the mode of transaction and evaluation of outcomes and monitoring of their execution.

Proper networking of institutions at the national level, such as, NCERT, NIEPA, NCTE, Ministry of Environment and forest and other related agencies will have to be done by specifically defining their roles and responsibilities. They will act as catalysts by way of providing guidelines, support materials and professional support for effective organisation of events and providing professional assistance up to the grassroots level. The NCERT in particular may provide model curriculum, curriculum guidelines and model instructional materials. The state level organisations may adopt these as per their requirements at their levels. The support of community and non-governmental organisations (NGOs) will also be necessary in affecting the change.

Professional support for teachers and teacher educators will have to be strengthened with the help of Information and Communication Technology
using video conferencing and multi-media packages, both for creating awareness and enhancing understanding of the environmental issues. The teacher education institutions will have to be galvanised to share responsibilities with regard to implementation of the EE syllabi.

Very active and meaningful support from the community will be central to the implementation of EE. Teachers or the school system in isolation will not be able to mobilise adequate resources required for creating any perceptible impact of EE. Moreover, when it comes to including the indigenous cultural traditions and ethos in the over-all EE curriculum, the contribution of the local community emerges as a precious resource.

The role of a strong politico-administrative will is underlined for achieving the stated objectives which are to be realised through the existing human power available with the system. It is hoped that with concerted efforts made by the various government and non-governmental organisations, community in general, parents, teachers and media, particularly the electronic media, would create an environmentally awakened and proactive society.

2.3 COMPONENTS OF EE:

The environmental components can be classified as follows:

- Physical Components: Land, air and water
- Biological Components: Plants and animals
- Social Components: Population, social system, social changes, urbanization etc.
- Cultural Components: Political, economic, moral values, religion etc.
- Psychological Components: Facts, self-concepts, level of aspiration etc.
- Energy Components: Solar energy and geothermal energy.
Some of the important international conventions that have been held to discuss environment are:

- The Baruch Plan of 1946 that regulated the use of nuclear energy
- United nations Scientific Conference in 1949 which focused on conservation and utilization of natural resources
- Nuclear Weapon Test Ban Treaty 1963

**Environment is basically classified into three categories:**

**Natural Environment:** This segment includes the natural things like air, water, mountains and so on.

**Social environment:** This segment covers the society in which man, the social being, lives from birth to death.

**Cultural environment:** This segment covers traditions, customs, social norms or rules and regulations

Broadly, environment includes the following:


The most prevalent opinion is that EE can be treated as 'discipline', which heavily banks upon basics of existing subjects such as Physics, Chemistry, Mathematics, Zoology and Botany. This opinion supports the training of specialists in EE, which will be much needed for planning, management, development and taking remedial steps for existing problems. Some courses (Gelderloos 1975, & Levon, 1971) have been formulated on these lines. A typical course of this type has been mentioned by Wuzzelbacher (1976), which has the following components:
1. Man and Environment.
6. Urban and Regional Planning.
7. Social Resources.
8. Tree Resources.
10. Fisheries Resources.
11. Wildlife Resources.
12. Air Pollution.
14. The Role of Citizens.

2.4 CONCEPTS OF EE:

The concept of environmental education can be classified as:

1. Education for the environment
2. Education about the environment and
3. Education for the environment

1) Education for the environment:

Environmental education is a pragmatic response of the defacement of the environment. Environmental education 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. Agarwal, (1986) has aptly said “This awareness of environmental problems is social awareness.” Such problems will be solved through economic causes of degradation of human environment.
2) **Education about the Environment**: 

Environmental Education includes conservation, outdoor and natural resource education as well as nature study but it also includes every thing that relates to man and his environment. EE is the study of man and how he shapes his total natural and cultural surroundings for good or ill. Man cannot be separated from the earth's ecosystem as he is the only conscious manipulator of the environment and his manipulation must be directed towards enhancing the quality of environment.

(3) **Education through the Environment**: 

Environmental education is not a separate subject. It is a multi-disciplinary approach both to education and to the problems of environment. All the subjects in the existing curriculum do have some information pertaining to environment but in their present form the subjects fail to relate to one another. Just as piecemeal attacks on environmental problems are ineffective so is piecemeal education about the environment inadequate because it does not take into account the interdependence of the pieces. EE must, therefore, be of wholes not of parts, if human race is to understand the totality of environment's subject areas must collaborate, integrate and coordinate. So that EE may prove effective in overcoming the environmental crisis. The multi-disciplinary approach integrates environmental education in to all learning, in all subjects, in all geodes, all year long and beyond the formal school years to a lifelong education.

Environmental education should result in the knowledge, desires and ability necessary to direct one's conduct toward improving the quality of life. It should enable the individual to perceive the problems that exist and to devise solutions to them. In order for students to develop an environmental ethic, "Man is a part of this earth rather than careless exploiter of it. If we exploit the nature in unwise manner, it will be difficult to support even a small population. But if we protect the nature, it will continue to meet the needs of all living things and not only for man."
The consideration of environment as natural heritage may be the integral part of environmental education. Only when our life is guided by respect for the earth and all living things, we will be able to live in harmony with our environment. They must now throw off their arrogance and perceive with humility, their place in the earth’s ecosystem and their ability to manipulate the environment. Their energies will have shifted from material growth to environmental protection. In short, the environmental ethic must provide them with a new rationale for their existence, or all the technology and power will not sustain their existence.

2.5 CHARACTERISTICS OF ENVIRONMENTAL EDUCATION:

The review of the definitions of EE indicates the following main characteristics:

1) It is a process of recognizing the interrelated ness among man, his cultural and biological surroundings.
2) It appears to be a process that equips human beings with awareness, skills, attitudes, values and commitments to improve environments.
3) It refers to the knowledge and understanding of physical biological, cultural and psychological environment and to perceive its relevance for real life situation.
4) It identified its imbalances of environments and tries to improve it in view of sustainable development
5) It entails practice in decision making and self formulations of a code of behavior about problems and issues concerning environmental quality.
6) It develops skills, attitudes, feelings, and values needed to play a productive role in improving life and values.
7) It involves child’s investigation and systematic exploration of his own natural and social environment and prepare himself to solve problems for improving his life.
8) It is problem-centered, inter disciplinary, value and community oriented and concerns with man’s survival and development. It concerns with the present and the future.

9) It provides the basis for construction and creative skills for the practice of healthy living and improvement.

10) It involves both theoretical and practical aspect of environment to improve the imbalances and prevent the deterioration or pollutions.

11) It utilizes educational approaches, methods and techniques of teaching to identify the real causes of environmental problems and practice problem solving skills in formal and non-formal situations.

2.6 SCOPE AND ASSUMPTIONS OF ENVIRONMENTAL EDUCATION:

Scope of Environmental Education:
The content of Environmental Education has four integrating and interrelated components. 1) Awareness, 2) Real-life situations , 3)Conservation and 4) Sustainable development.

1) Awareness : This include making the individual conscious about physical, biological, social and cultural aspects of Environment. The environment is linked with the life support system which in itself has six components namely Air , Water , Land , Flora , Fauna and Sun-light. These components have dynamic inter-relationship and man has great responsibility to preserve them.

2) Real-life situations : These link environment to life , these conditions are location-specific, thus problems and priorities of each area are different.

3) Conservation : It deals with utilization of natural resources not only by the present generation but also by the future. It does not include the process of exploitation.
4) Sustainable Development: It aims at utilization of resources for development. All resources are finite and there is also a limit to the growth of a living system. Thus, the efforts are to be made to utilize the resources wisely and intelligently.

Assumptions of Environmental Education:

The following are the main assumptions of Environmental Education:

1) To consider the environment in its totality (natural and artificial, technological, social, economic, political, moral, cultural, historical and aesthetic)
2) To consider a continuous life process (from pre-school to all higher levels, formal as well as non-formal)
3) To be inter-disciplinary approach in EE
4) To emphasize active participation in prevention and solution to environmental problems.
5) To examine major environmental issues and problems from local, national, regional and International point of view.
6) To focus on current and potential environmental situations.
7) To consider environmental aspects in plans for growth and development.
8) To emphasize the complexity of environmental problems and need to develop critical thinking and problem-solving skills.
9) To promote the value and necessity of local, national and international co-operation in the prevention and solution of environmental problems.
10) To utilize diverse learning about environment and different approaches in teaching and learning about environment.
11) To help learners to discover the symptoms and the real causes of environmental problems.
12) To relate environmental sensitivity, knowledge, problem solving and value clarification at every grade level
13) To enable learners to have a role in planning their learning experiences and provide an opportunity for making decisions and accepting their consequences and
14) To develop the abilities of doing and understanding growth, structure approaches and programs of environmental education.

These objectives and assumptions are the guiding principles for developing content course of Environmental Education.

2.7 AIMS, OBJECTIVES AND ATTRIBUTES OF EE:

2.7.1 Aims:

The specific aims of E.E. fall into three groups (Vidart, 1978):

1. Cognitive aims: These include importing knowledge about environment and an ability to think which will enable the individual and his social group to work out political solution to the wide variety of problems connected with environment.
2. Normative aims: These relate to the inculcation of ecological awareness which will be conducive to the creation of modification of value models enabling the individual and the group to identify the factors that upset the environment equilibrium (which is nothing other than the ecological equilibrium) and protest against them.
3. Technical and applicative aims: This means planning collective practices which preserve, improve or restore the quality of life, as understood by the community in the light of formal and informal education in such a way that the demands made by economic development do not conflict with the biological rhythms of the ecosystem.

On the basis of the objectives of EE, one can draw certain conclusions about its special features. The most important feature is that it is interdisciplinary in nature. This is so because environmental problems and issues are not confined to the rigid boundaries of physics, chemistry, mathematics, zoology or any other established discipline but it involves an amalgamation, not even conglomeration, of many of the well known subjects.
2.7.2 OBJECTIVES:

A) INTERNATIONAL LEVEL:
A number of objectives of environmental education have been formulated for both formal and non-formal education at all levels at the International Conference of UNESCO (1977) held at Tbilisi. These are as follows:

1) To develop an awareness of environment and sensitivity (Feeling and attitudes) to the total environmental and its allied problems

2) To help in acquiring knowledge and variety of experience of the environment and associated problems.

3) To develop a basic understanding of structure, processes and problems of environment, interdependence of environmental components.

4) To help in acquiring skills for identifying and solving Envtl. problems.

5) To develop attitudes, a set of values and feelings of concern for the environment and encouragement or motivation for active participation in protection and improvement of environment.

6) To provide an opportunity for an active participation or practice at all levels in working for the solution of environmental problems and

7) To develop an ability for evaluating environmental components and educational programs in terms of ecological, economic, social, cultural, aesthetic and educational factors.

The above objectives are related to all levels and both formal and non-formal systems of education. In the formal system of education four different but inter related components have been recognized as noted below.

<table>
<thead>
<tr>
<th>Objectives</th>
<th>Level</th>
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<tbody>
<tr>
<td>1. Awareness of environment</td>
<td>Primary education (knowledge)</td>
</tr>
<tr>
<td>2. Relevance for real life situation of environment (understanding)</td>
<td>Secondary education</td>
</tr>
</tbody>
</table>
3. Conservation of natural resources -- Higher Secondary education of environment (skills)
4. Sustainable development by solving -- College and University Problems of environment Education.

Thus environment education objectives involve the doing and understanding aspects of environment.

The objectives of EE programmes are drawn on the basis of the objectives described in Belgrade charter. In practical terms the objectives of EE have been stated by Stapp et al. (1970) as follows:

1) A clear understanding that man is an inseparable part of a system, consisting of man, cultural and biophysical environment and the man has ability to alter the interrelationship of this system.

2) A broad understanding of the biophysical environment, both natural and manmade, and its role in the contemporary society.

3) A fundamental understanding of the biophysical environmental problems confronting man, how these problems can be solved and the responsibilities of the citizens and government to work towards their solution.

4) Attitude of concern for the quality of biophysical environment that will motivate citizens to participate in biophysical environment problem-solving.

On the basis of the objectives stated above, it can be said that the most important feature of Environment Education is that it is interdisciplinary in nature. This is because environment problems and issues cannot be confined to the boundaries of physics, chemistry, mathematics, zoology, botany or any other discipline. On the other hand, Environmental Education is an amalgamation of many of the conventional subjects. The other important feature of Environmental Education is that it deals with education in skills, values and attitudes of the people with respect to their environment. Therefore, in Environment Education, one has to look at various aspects of environmental problems objectively and take decisions accordingly. Very often, the decision may be in conflict with the present practices and beliefs. Environment
Education also develops, modifies and improves upon existing attitudes and values towards one’s environment.

B) NATION AL LEVEL :

The objectives also vary according to the needs of the society in question. For example, the problems of developing and developed countries are different, there may be variation in objectives due to this also.

In the Indian context, this may mean inclusion of (1) appreciation of many religions and develop a sense of respect for all of them. (2) appreciation of the cultural unity in the diversity of the country, and (3) to develop a sense of belongings for poor and downtrodden, among the objectives, thus development of sense of concern for the environment both physical and cultural, its problems, ability to solve those problems and ability to evaluate the environmental measures and programmes forms important part of EE.

A probable concept map stating aims and objectives in conceptual terms is shown (Young, 1981). Here objectives have been divided into eight categories: Identification Perception, Interdependence, Interaction, Caring, Controls, Change and Challenges. Each category has three levels-personal development, social relations and environmental perceptions. This ‘cringe’ includes ‘for one’ self and one’s actions at personal level, ‘for other’s feelings. Values, actions for ones role in groups’ at social level and ‘for total environment and for elements in it’ at perception level. Similarly other categories of objectives have been visualized.

There are several Governmental and non-governmental organizations to educate people and to create awareness of environment. A Department of environment has been setup in 1982 on environmental information system for this purpose. There is a Centre for Environmental Education (CEE) at Ahamedabad. There are more than 3200 NGOs are working in India for environmental education.

The environmental education aims at developing in the child an awareness and understanding of the physical and social environment in its totality. Fortunately environmental education has been introduced in school curriculum from an early stage in our country.
Kothari Commission (1966) recommends “Environmental activities will lead to study of Natural sciences, Physical sciences, Geography, History and Civics. Construction and creative skills will provide the basis for the practice of simple arts and crafts and practice of healthy living will serve as the foundation for the environmental education”.

The main objectives of EE in India may be stated as follows:

- To enable the child to use his own environment as a source of stimulus for learning, by developing awareness in the child about the various features of his immediate environment.
- To help social groups and individuals develop knowledge and gain a variety of experiences besides acquiring a basic understanding of the environment and problems associated with it.
- To enable the children and other social groups acquire a set of values and feelings of concern for the environment by developing a scientific attitude in them.
- To acquire skills for identifying and solving environmental problems.
- To help children assimilate process skills. The main ones among them are: observing, classifying, measuring, recording, experimenting, hypothesizing, communication and inferring.
- To create an atmosphere in the school and classroom so that students can participate in problem-solving and decision making plans and procedures.
- To develop the capabilities to evaluate the effectiveness and workability of developmental programmes.

2.7.3 ATTRIBUTES:

There is increasing literature on E.E. and some of it describes its characteristics. The commonly agreed characteristics are (UNESCO, 1981):

1. Environmental education should be integrated into the whole system of formal education at all levels,
2. Environmental education should be interdisciplinary in nature,
3. Environmental education should adopt a holistic perspective which will examine the ecological, social, cultural and other aspects of particular problems,

4. E.E. should be centered on practical problems related to real life and

5. E.E. should aim of building up sense of values.

2.8 PRINCIPALS OF ENVIRONMENTAL EDUCATION:

One of the method of developing observational skill is encouraging children to explore, experience and assess their own environment and to modify it as far as possible to suit their own needs and the needs of their community and of the society at large. Keeping these objectives in view, emphasis is being increasingly laid on environmental education as an integral part of the school curriculum. The educational principles that buttress support to the inclusion of environmental education in school curriculum given by Ambits (1990) are as below:

1) Environmental education helps in programming learning experiences from 'simple to complex'. For illustration, children look at a bird, observe its colorful plumage, see it eating figs or insects or watch it flying, etc. All this gives them same awareness of the eating and flying habits of birds.

2) Environmental education help children to priced from 'indefinite ideas to definite' ones. In this connection, it may be said that the first perceptions and thoughts of children are as vague as their first movement and the first attempt at speech. Environmental education helps in sharpening the development of these observational skills and hastens the transition of ideas in children's mind from indefiniteness to definiteness.

3) Environmental education helps children to proceed from 'concrete to the abstract'. This is a very simple educational maxim and does not need any elaboration. Still it may be said theta environment is full of concrete things which children may examine and classify and interpret,
and then draw their own conclusions and inferences about them. For example, children may observe different types of plants and animals and classify them according to their species, genus, family and order.

5) Environmental education helps the ordering of learning experiences from ‘empirical to the rational’. Needless to say, empirical to rational is a very important educational maxim and like other educational maxims described above, was given the pride of place by no less on educational than Herbert Spenser. This maxim is satisfied very well in environmental studies as children can observe phenomena and conclusions and rational explanations. Having argued so, they may verify their hypotheses experimentally.

6) A corollary of the foregoing principle which is so dear to the hearts of educationists is that education should help the child in the ‘process of self-development’. This means that children should be encouraged to conduct their own investigation and draw their own conclusions. They should be told as little as possible and made to discover as much as possible. This principle is very much consistent with what thinking man always do in life, namely, self instruction which has been the warp and woof of human progress and discovering things for themselves is possible maximally in programmers of environmental education.

7) Education of the child must follow the same sequence as existed in the education of mankind, considered historically. This means that the genesis of knowledge in the individual should follow nearly the same course as the genesis of knowledge in the race. This principle can be followed both in letter and spirit in programmers of environmental education. Children when taken out to afforest and appreciate the sequence in which knowledge was developed by man.
8) The next important educational principle of environmental education is the pleasurable excitement. This principle can be appreciated by one who has seen the children’s faces and the intense delight on them when they are picking up flowers and insects or hoarding pebbles and shells.

9) The eighth principle of environmental education is that it makes Childs education problem based for understanding and the hazards of its destruction of wild life the dereliction of land, etc. are problems that all of us should silver in order to save mankind from extinction.

10) The last but not the least important of principles of environmental education is its social relevance its relevance to mans interaction with his physical and social environmental it relevance to changing human attitudes which curve man to hate man and beget hatred on one.

According to Roth . Pella and scoffed (1970), there have been few attempts to formulate sets of principles for environmental education. Because of its multi-disciplinary nature it borrows principles from many fields. The principles of environmental education may be envisaged as under:

1. Man is a rational animal.
   - He has developed tools for modifying his surroundings.
   - He can make decision affecting the environment.
   - He must live in partnership with nature and in harmony with natural laws and principles (The ecological approach.)

2. Environmental improvement requires cooperative effort.
   - Planning is a means of foreseeing the effects of our actions (The systems approach.)
   - Data gathering is necessary to assure optimum environmental decisions.
   - The patterns of land use reflect the values of a society.
   - The growth syndrome has placed a premium on development at the expense of the environment.
   - The attainment of quality environment depends on the communication of ideas
   - Environmental education is inter-disciplinary, multi-disciplinary and trans-disciplinary.
Environmental education operates at the grassroots level and is concerned with individual behavior.

Environmental education involves students in activities.

Environmental education necessitates field studies, rural or urban and experiences beyond the classroom.

Environmental education develops an ethic contributing to the quality of life: (a) it respect individual life style (b) it is based on constructive attitudes.

3. The sharing of resources is a global concern.

- Materials of the earth become resources through human perception of potential uses.
- Earth resources are unequally distributed and unequally consumed.
- The consumption of resources may convert them into irretrievable forms or into substances dangerously harmful to living organisms.
- Recycling of industrial production and ecologically balanced agricultural production are means of maintaining sustained yields from resources.
- The people of the world are all astronauts on spaceship earth.
- The earth is our only home; it contains our life support systems.
- The limits of the human population-carrying capacity of the earth are currently unknown but observations indicate the desirability of some forms of population limitation and redistribution.

The above-mentioned principles were taken into account in designing the materials and strategies for this study.

Guiding Principles: Environmental education should -

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

❖ Be a continuous life long process, beginning at the preschool level and continuing through all formal and non-formal stages.
❖ Be interdisciplinary in approach, drawing on the specific content of each discipline in making possible a logistic and balanced perspective.

❖ Examine major environmental issues from local, national, regional and international point of view and so that students receive insight into environmental conditions in other geographical areas.

❖ Focus on current and potential environmental situations while taking into account the historical situations.

❖ Promote the value and necessary of local, national and international co-operation in the prevention and solution of environmental problems.

❖ Explicitly consider environmental aspects in plans for development and growth.

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

❖ Relate environmental sensitivity, knowledge, problem solving skills and values clarification to every age, but with special emphasis on environmental sensitivity to the learner's own community in early years.

❖ Help learners to discover the symptoms and real causes of environmental problems.

❖ Emphasize the complexity of environmental problems and thus the need to develop critical thinking and problem solving skills.

❖ Utilize the diversified learning environments and a broad array of educational approaches to teaching and learning about and from the environment with due stress on practical activities and first-hand experience.

2.9 EE AND EA, DIFFERENCES & INTERRELATION:

Environmental Education:

"Environmental education involves a comprehensive, lifelong education, one responsive to changes in a rapidly changing world. It prepares the individual and communities for life, through and understanding of the major problems of the interaction of the biological, physical, social, economic and cultural
aspects of the individual and communities. It provides skills and attitudes needed to play a productive role in improving life and values in order to enable people to enjoy good health and high quality of life."

The environmental education aims at developing in the child awareness and understanding of the physical and social environment in its totality. Environmental studies involve a child's investigation and systematic exploration of his own natural and social environment and prepare himself to solve the problems for improving his life.

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 surroundings which includes the relation of population, population resource allocation, transportation technology and urban and rural planning to the total human environment. Environmental education must utilize 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. It should help learners to discover the symptoms and real causes of environmental problems and thus to develop critical thinking and problem solving skills. Environmental education 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 in making possible a holistic and balanced perspective.

"Environmental education is problem centered interdisciplinary, value-oriented, community-oriented, and concerns with man's survival as species, based on student-initiated actives and involvement present and future oriented."

-- Cook and Hearn (1971)

"Environmental activities will lead to the study of natural and physical sciences, social sciences. Construction and creative skills will provide the basis for the practice of healthy living will serve as the basis for the practice of healthy living and will serve as the basis for environmental education."
The study of natural and physical sciences, social sciences and geography provides the awareness of the environment but do not employ methods and techniques to improve the imbalances and prevent the deterioration. Similarly, the study of psychology provides the awareness and learning, but educational psychology provides the awareness about learning as well as practice the methods and techniques for improving learning. The environmental awareness is limited to the understanding aspect while environmental education has the productive role in improving life and values.

Environmental Awareness:

The terms environmental education and environmental awareness are used interchangeably for the same meaning but there is significant difference in these two terms. The study of physical and bio-sciences, geography and agriculture provide the environmental awareness. But this awareness does not help in developing skills and attitudes for improving environment. Therefore it is essential to understand the concept of environmental awareness and differentiate it with educational environment.

Environmental awareness may be defined as to help the social groups and individuals to gain a variety of experiences in and acquire a basic understanding of environment and its associated problems. World Educational and Environmental crisis will require environmental awareness and understanding to be deeply rooted in the educational system and at all levels.

At the Belgrade International Workshop 1975 working documents were provided by the trend papers and described the state of the art of Environmental Education in all parts of the world and provisions to extend and explore the environmental Awareness. It also states that Environmental Awareness may provide power of understanding.

- To recognize the interdependence among materials into physical environment, plant and animal life for survival, growth and development.
- To take decisions individually and collectively and initiate actions for social, cultural and economic survival, growth and development and for conservation of nature and natural resources.
- To identify human, material, space and time resources in the environment.
- To recognize ways of making effective use of environmental resources for social, economic and cultural survival, growth and development.
- To take decisions for the effective use of resources, to recognize the special significance of conservation of natural resources and initiate or support community efforts for the purpose.

**Developing Environmental Awareness:**

The United Nation Conference of Human environment (Stockholm, June, 1971) was a major event for those concerned with the quality of the world's environment. One of the recommendations of the Conference resulted in the creation of United Nations Environmental Program (UNEP) while other recommendations specially constituted the foundation of framework for cooperative effort in International, which states that Environmental Awareness may be developed by-

- Identifying; analyzing and understanding the needs and problems of personal life including health, vocation, etc.
- Social life and different levels viz., family, caste, community, religion, town or village life, state and country.
- National life including civic, economic etc.

**Environmental awareness may also be developed when we** -

- Appreciate, promote and use the environment to improve health, vacation and social and national life.
- Interact with government and social agencies and utilize the developmental facilities provided by these agencies in his/her individual capacity and also for organizing certain community activities.
- Develop the aesthetic sense to appreciate beauty and adopt it in personal and social life.

Environmental awareness provide the understanding and competence to recognize environmental resources and interdependence between physical and biological components of the environment for the growth and development.
The areas and content of environmental awareness have been enumerated in
the following para.

Content of Environmental Awareness

Awareness to environment is a horizon-sweeping word and presents
the totality of Social, Biological and Psychochemical factors individually or
collectively that comprise the natural and man-made surroundings.
Environment can be classified into the following basic components.

i) Physical components- water, air, land, light temperature, humidity.

ii) Biological components -- Aquatic and Terrestrial flora (plants) and
fauna (animals)

iii) Human uses- Agricultural, Industrial, Residential, Forestry,
Transportation, water supply, Navigation, Hydropower and
Recreation

iv) Human values- traditional life style, religious status, archeological
and economic base, community structure.

Hence the term “Environment” therefore can cover the whole spectrum of
science and humanities. Therefore “Environmental awareness” is
interrelated and interactions between living systems and life.

Difference between Environmental Education and Environmental
Awareness

Environmental Education (EE) is an effective process to develop the
understanding of Environmental Awareness (EA). EA is the most important
aspect of Environmental Education but the whole. These may be
differentiated in the following ways.

1) The EE has the main task of having the productive function in
order to improve the quality of life and values, whereas EA as the
main task of providing the understanding of physical and biological
components of the environment and their interdependence.

2) The EA provides the understanding of natural, physical, and
biological environment of an organism and to identify human,
material, space and time resources in the environment, while EE
includes the awareness of the physical, biological, cultural and
psychological environment of man. It investigates the methods and techniques for modifying and improving quality of man and community as a whole.

3) The cultural and psychological environments are crucial in EE because organization, climate and health of an institution is governed by the psychological principles and social and emotional climate of class room teaching is generated by the psychology of the subject teacher, while EA provides the knowledge and understanding of inter dependence of physical and biological components and ecology of the organism.

4) EE plans and generates the conductive environment for desirable changes in man. It manipulates the environment whereas EA involves the knowledge of both natural and manipulated environment, but it confines itself only up to the theoretical aspect.

5) The EE provides the opportunities and situations for performing certain tasks and activities at all levels for solving environmental problems, while EA is limited to the problems and their solutions but does not involve task and activity.

2.10 ROLE OF EDUCATION IN DEVELOPING OF E.A. :

Environmental awareness is the ability to understand the problems of environment through the relevant experiences and the assistance extended to the society and its individuals to solve these environmental problems.

The government and various non-government organizations are adopting different strategies to promote awareness on environment in the country. The Ministry of Environment and Forests accords top priority to promote environmental awareness among various age groups. The National Museum of National History, New Delhi, promotes non-formal education in the area of environment and conservation. Besides permanent exhibit galleries on various aspects of environment, the museum also conducts temporary exhibitions and a large number of educational programmes and activities for school children, college youth and general public. An Environmental Information System (ENVIS) has been set up by the Government for
collection, storage, retrieval and dissemination of environmental information
to decision-makers, policy planners, scientists, engineers, environmentalists,
research workers and the general public all over the country. ENVIS centers
are set up in various institutions and organizations in the country on priority
areas of environment such as environmentally sound and appropriate
technology, biodegradation of wastes, desertification, estuary, mangroves,
corals and lagoons, media and environment, environmental education, solid
waste disposal, animal ecology, himalayan ecology etc. Non-governmental
organizations also play a critical role in advancing environmental awareness
through research, publications, training, funding, and outreach activities.
Organizations like the National Council for Educational Research and
Training (NCERT) also play a crucial role in promoting environmental
awareness. The corporate sector is also playing a role in spreading
environmental awareness in the country.

The Belgrade International Workshop-1975, recommended the
following for creating environmental awareness:

- Recognize the interdependence that exists among plants, animals,
development, growth and physical environment.
- Take a collective decision on the strategies to protect nature and natural
resources and the progress, growth and development of social, cultural and
economic aspects.
- Take a decision on the optimum utilization of natural resources.
- Adopt the necessary steps to seek the society’s help to protect the natural
resources.

Environmental awareness is essential for:

- Protection of the atmosphere (climate changes, depletion of ozone layer)
- Protection of land resources (combating deforestation, desertification and
drought)
- Conservation of biological diversity (protection of fresh water resources
and oceans and coastal area and the national use and development of their
living resources)
• Environmentally sound management of biotechnology and hazardous wastes
• Prevention of illegal traffic in toxic products and wastes
• Improvement in living and working conditions of the poor by eradicating poverty and stopping environmental degradation.

On promoting environmental awareness, the National Conservation Strategy and Policy Statement on Environment and Development says:

“ To raise public awareness and involvement in environmental activities, the mass media ranging from local folklores to electronic should serve a vital role. To raise public awareness on environmental issues and to promote people’s participation in environmental activities and conservation of natural resources, development of environmental education resource material and use of traditional and modern media of communication need to be strengthened. Scope and functions of the existing environmental education centers should be further strengthened and enlarged to develop a network of infrastructure and environmental education including development of orientation centers and provision of education material for visitors at the national parks, sanctuaries and tiger reserves.”

The role of media in crucial is promoting environmental awareness. While realizing this aspect, the following should be borne in mind:

• Effective communication strategies should be established as an integral part of any major programme of environmental awareness.
• The communication should be a long-term interactive process aimed at particular groups and audiences.
• Findings of the studies conducted in public interest should be communicated to the public on whose behalf they were carried out.
• Attempts must be made to simplify complex issues like sustainable development to avoid confusion and misunderstandings.
• While communicating messages on environment, begin with what the audience is familiar with, largely things relating to local issues, and introduce the subject that is to be conveyed.
• The credibility of the message and the carrier of the message should be beyond doubt if the message is to have the intended effect.

2.11 EE AND ENVIRONMENTAL ATTITUDES:

Development of Attitudes:

Another common objective of Environmental Education is development of positive attitude with varied emphasis. While in some programmes, attitude development may be an end in itself, in others it may be considered as a transitory phase to the ultimate development: of commitment to social action. These are two extremes. In practice, the objective of development of attitudes may lie anywhere between these two extremities. Rajput et al state that developing positive attitude towards environment is one of the four components of environmental approach. In another curriculum the objective is to encourage the attitudes of responsibility for the selection, use and final disposal of those products, which create a problem of waste in the environment. Womersley (1981) puts forward a more advanced objective, where formation of attitude is a vehicle for higher-level achievement, when he says, “to provide every person with opportunities to acquire knowledge, values, attitudes, commitment and skills to protect and improve the environment.”

2.12 EE AND SUSTAINABLE DEVELOPMENT:

Concept and Need for Sustainable Development:

All of us need food, shelter, clothes, entertainment, cultural and spiritual sustenance and a host of other material and non-material things. The development processes that we have adopted are supposed to provide these, besides ensuring that everyone has access to them. However, our development model (tailored on the world’s dominant model) has focused so heavily on some material goods and services that a number of other essential aspects have been overlooked or ignored. We are extracting natural resources like water, forests, fisheries, mineral, soil nutrients etc., at a pace faster than their capacity
to regenerate. Not only this, we are also pumping pollutants back into the natural ecosystem at rates far higher than they can absorb, or can be cleaned up. The result is an unsustainable development model that could collapse any time. According to an estimate made by the Tata Energy Research Institute (TERI), the economic losses due to soil degradation, forest degradation and diseases caused by pollution is between Rs.100,000 crores to Rs. 450,000 crores every year. Obviously, we cannot afford to continue with this unsustainable form of development and there is an urgent need for switching over to sustainable development.

Sustainable development aims at improving the living standards and the quality of people’s lives, both now and for the future generation. As countries strive to ensure that citizens both in urban and rural areas have clean air to breathe, safe drinking water, and adequate supplies of clean renewable energy. Agriculture and industry are the important sectors in which natural resources such as land, soil, forests, rivers, oceans and mineral deposits upon which they rely have to be used efficiently and responsibly. Environmental problems are linked to economic issues like poverty and social issues like population growth. Population growth puts pressure on natural resources as well as on the capacity to provide amenities like housing, health care, education, safe drinking water and sanitation.

Many of our environmental problems are the manifestations of our developmental activities. The policymakers can assess the full impact of the developmental decisions that are made on the quality of life only when information about the environment is combined with social and economic data of the citizens. The task before the governments is to create development strategies that incorporate values of environmental sustainability while increasing economic growth and providing adequate social services. One way of measuring a country’s development is to look at the environmental data such as access to safe drinking water that measures the percentage of people who can get the safe drinking water they need to lead healthy lives.

In 1992, the governments of the world, at the United Nations Conference on Environment and Development, held in Rio de Janeiro, signed
a series of historic agreements and statements, pledging their support for the move towards sustainable development. This development agenda for the 21st Century, called Agenda 21, is an expression of collective aspirations and commitment of the signatories (nations) to push it forward from a statement of hope to a pragmatic blueprint for organizing a sustainable society out of the present economically and environmentally inequitable world. Though almost all the countries agreed upon the Agenda 21, they were free to choose their strategies according to the needs, priorities and resources.

The concept of Sustainable Development had its origins in the World Conservation Strategy (WCS) Report, published in 1980. It says, "Conservation is the management of human use of the biosphere so that it may yield the greatest sustainable benefits to present generations, while maintaining its potential to meet the needs and aspirations of future generations". Sustainable Development was formally defined for the first time in the Brundtland Report (1987) as "Sustainable Development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs". According to this definition the following is implied:

- The concept of 'needs', in particular the essential needs of the world's poor, should be given overriding priority (poverty focus) and

- The idea of limitations imposed by the state of technology and social organizations on the ability of the environment to meet present and future needs (future focus).

Sustainable Development aims at creating chains of mutual, social, economic and environmental benefits at local, intermediate and global levels. Benefits of Sustainable Development at the local should include the provision of basic needs such as food, water, shelter and health. According to Agenda 21, Chapter 15, urgent and decisive action is needed to conserve and maintain genes, species, and ecosystems, with a view on Sustainable Development and use of biological resources. The participation and support of local communities are elements essential to the success of such approach.
Sustainable Development suggests that meeting the needs of the future depends on how well we balance the social, economic and environmental objectives or needs, when decisions are made. Many of these objectives may seem to conflict with one another in the short term. For instance, industrial growth might conflict with preserving natural resources. But if long-term plans are made and responsible use of natural resources is ensured, it is possible to ensure that there are resources available for sustained industrial growth even in the distant future.

The traditional economic approach emphasizes growth as a condition to development through physical and financial capital accumulation. Sustainable Development, on the other hand, emphasized on achievement of continuous well-being by searching for an optimal balance in the formation and use of different resources and capital types — human capital, physical infrastructure and tools, natural resources, financial resources, technology and tools, natural resources, financial resources, technology and decision-systems. We can strike a balance between these two approaches through the following means:

- Giving citizens the means — freedom, education and employment — to be effectively involved in the decision making concerning their future, and the means by which conflicting interests are peacefully resolved through negotiations between interested parties.

- A culture of modernity that gives credence to change and looks at science as the basis of explaining reality, and encourages people to express renewed solidarity, and encourages people to express renewed solidarity towards others and have a concern for environment.

- Technical solutions for achieving new combinations of various forms of capital in particular human and natural capital, which result in increased productivity and reduced impact on the environment.
• Economic tools enabling decision-makers to include all the factors involved in the process of production, and in particular the value of natural capital.

• Notion of international solidarity that is based on more equitable and balanced cooperation and exchange.

If Sustainable Development is to be given the priority that it deserves, the following measures should be adopted to sensitize or educate the decision makers.

• Specialized public or private institutions should provide government decision-makers with primary sources of information on social, economic and environmental issues, which they need for policy formulation.

• Public interaction, debate or consultation during the development of legislation will expose legislators to a range of views and criticism from various sectors of society. The efforts of interest groups, when critically appraised, can be an excellent source of up to date information, and an indication of the positions of various influential constituencies regarding the treatment of economic, cultural and environmental issues.

• Internal departments responsible for environmental compliance should be established within the companies. Apart from incorporating environmental concerns into the business planning process, the department may also train employees in environmental safeguards, pollution prevention procedures, workers health and safety protocols.

• Information on technological possibilities (combination of physical and human capital, use of resources, opportunities to reduce waste and environmental impact) should be collected with a view to gain efficiency and competitiveness. This will be an excellent source of specialized environmental, technological and economic information at the disposal of the management.
Agenda 21, adopted at the Rio Summit in 1992, advocated the following measures to achieve Sustainable Development.

- Make environment and development education available to people of all ages.

- Incorporate the concepts of environment and development into all educational programmes with analysis of the causes of major issues. There should be a special emphasis on the training of decision-makers.

- Involve schoolchildren in local and regional studies on environmental health, including safe drinking water, sanitation, food and the environmental and economic impacts of resource use.

According to Agenda 21, the world needs a flexible and adaptable workforce, equipped to meet growing environment and development problems, and changes during the transition to a sustainable society. The countries should.

- Set up training programmes for school and university graduates to help them achieve sustainable livelihoods.

- Encourage all sectors of the society, including industry, universities, governments, non-governmental organizations and community organizations to train people in environmental management.

- Work with the media, theatre groups, entertainment and advertising agencies to promote a more active public debate on the environment.

- Bring indigenous people’s experience and understanding of Sustainable Development into education and training.
2.12.1 ROLE AT INTERNATIONAL, NATIONAL AND STATE LEVELS:

International Initiatives:

Now it is being increasingly realised all over the world that living a harmonious and healthy life on this planet earth is man's greatest need. He has nowhere else to go to. Understandably therefore, humanity needs a new relationship with nature, a healthier bond between the "Self" and the "Surroundings", a new set of cultural values and a "paradigmatic shift" in the global vision of earth-man relationship. The two "Earth Summits" , the first one held in Stockholm, Sweden in June 1972 and the second one held in Rio de Janeiro, Brazil in 1992 discussed about man made global warming and the depletion of bio-diversity. Declarations of far reaching consequences were made at these Summits. In the international context, the Report of the Club of Rome in early seventies of the last century strongly advocated the environment factor. But the remedy prescribed, ie: 'No-Growth' was a bitter pill. It was followed by the Report of the Independent Commission on International Development issues under the chairmanship of Willy Brandt, North-South "A Programme for Survival (1980)". The Brundtland Commission Report (1987) really looked closely and critically at the environmental issues. This Report also provided an explanatory link between third world poverty and global environmental deterioration. It also generated intellectual awareness of new type of growth, ie:"Sustainable Development". The World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002 had the same theme.

International Efforts in the field of Environmental Education:

Since 1970, there has been a growing effort and activity on the educational front devoted to environmental problems and to environmental education. The United Nations reflected the global nature of this awareness through its first international conference in 1972 on the Human Environment in Stockholm, Sweden. The conference revealed a widening interest in the environmental problems and also exposed a lack of widespread experience in tackling the problems. Perhaps the most out-standing achievement of the
conference was the establishment of the United National Environment Programme (UNEP) which together with UNESCO, embarked upon an International Environment Education Programme in January 1975.

In 1975, this programme held an International Environmental Education Workshop in Belgrade Charter, Yugoslavia. A major outcome of this Workshop was the Belgrade Charter. This Charter recognized the urgent need in environmental education to develop a global understanding or perspective of the ecological, economic and moral considerations.

**Belgrade Charter, 1972** States the goal of Environmental Education is to develop a world population that is aware of and concerned about the environment and its concerned problems and which has the knowledge, skills, attitudes, motivations and commitment to work individually and collectively toward solutions and current problems of the prevention of new ones. The charter further says the goal of EE is “to improve all ecological relationships including the relationship of humanity with nature and people with each other”

The Belgrade Workshop was followed by a series of regional meetings of experts. The Asian regional meeting took place in Bangkok in 1976 and brought together representatives from a number of countries of the region to review and evaluate the Belgrade recommendations in the more specific regional context prior to a world conference at an inter-governmental level. The inter governmental conference on Environmental Education was held in Tbilis, Georgia, USSR, in Oct-1977, and marked the culmination of the first three year programme on environmental education.

**Tbilisi Report:** USSR 1977 report on Inter-governmental conference on environmental education has summarized the ultimate aims of environmental education.

1. To enable human beings to understand the complex nature of the environment as this results from the interaction of its biological, social and cultural aspects.
2. To provide the individual and the community with the means of interpreting the interdependence of these various elements in the environment. So as to create a greater sense of awareness of their place in the environment.

3. To promote a more cautious use of the possibilities and resources of the universe to satisfy the present and future material and spiritual needs of mankind.

4. To contribute to the development of a national awareness of the importance of the environment in the economic, social, cultural processes.

5. To provide a clear awareness of the economic, political and ecological interdependence of the modern world and develop a spirit of responsibility and of solidarity between countries and regions.

The next earth summit as it is commonly known took place in Rio de Janeiro in June 1992. This summit was vastly attended by 3000 strong Non governmental organizations representatives along with other delegates. Agenda 21, a comprehensive plan to guide national and international action towards sustainable development was put forth. It was this agenda that encouraged the non governmental organizations to play a more prominent role in guiding and coordinating environmental policies and programmes.

Thus, environmental education came into existence in 1970. The objectives of environmental education were given in the Belgrade charter in 1972. Where as the aims and goals of environmental education came clearly in the Tbilisi report and Earth summit gave impetus to the non governmental organizations. The non governmental organizations work with school children and help them to achieve the objectives of environmental education.

National Efforts in the field of Environmental Education:

In India too, environmental issues attracted popular attention and it was felt that education had to respond appropriately to this crying need of the time. The National Policy on Education _ 1986 (renewed in 1992) 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 for Elementary and Secondary Education: A Framework - 1988 presented the NCERT's view: “The school curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy”. In consonance with these documents, environmental studies was made an independent subject at the primary level and topics related to environment were suitably infused with different science and social science subjects at all school stages. Books under 'Reading to Learn' series were brought out to highlight a number of environment related subjects and concerns. Emphasis was also laid on teacher orientation-cum-training in the subject and a number of training modules were developed by the NCERT.

The National Curriculum Framework for School Education (NCFSE) -2000 also highlights the need for including Envtl. concerns at all the levels of schooling. It asserts the Fundamental Duties (Article 51 A of part IV A of the Indian constitution) “......protect and improve the national environment including forests, lakes, rivers, wildlife and to have compassion for the living creatures.......” (Common Core Components). As one of the General Objectives of Education, it mentions “understanding of the environment in its totality, both natural and social, and their interactive processes, the environmental problems and the ways and means to preserve the environment”. Following these recommendations, a subject- the Art of Healthy and Productive Living, along with language and mathematics has been introduced at the level of Classes I and II. All the three Subjects are to be woven around the immediate environment of the learners and integrate environmental concerns as well. In Classes III and IV, Environmental Studies becomes a separate subject. In Classes VI to X, Environmental Education (EE) has been integrated suitably in social sciences, languages and science and technology. At the higher secondary level, 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 the traditional subjects. In the Vocational Education stream, EE and rural development have been suggested as a part of the General Foundation Course at this stage.

Ecology and environmental studies in education in India have not been satisfactory and do not match with the quantum of researches in these areas of science being carried out in the country, although at international level there have been repeated efforts to identify the problems and stress the urgency of implementing the environmental education and research programmes on a very extensive scale. The researches in this area will be discussed in third chapter. The non governmental organizations are doing a nice job with school children and college children. Apart from this, Environmental science/Studies has become a part of curriculum/subject at various levels of formal education.

Environmental Education – Recent Development and NCERT:

The Department of Education in science and Mathematics of NCERT has undertaken a project (1993) to analyse the school curricula developed by the council as part of the implementation of national policy on Education (1986). The analysis was done to identify the EE concepts and activities vis-à-vis the universal objectives of EE (Awareness, Knowledge, Skills, Attitudes, Participation) as agreed at the Tbilisi Conference (1977). This exercise also helped in the identification of the strengths and weaknesses of NCERT curricula in terms of expectations of EE.

The Department of science and Mathematics, on behalf of the NCERT, also undertook a UNESCO sponsored case study on Environmental Education in India. This opportunity provided insight into the present status of EE Concepts and training at the school level, higher education and technical education. This would help in strengthening EE components at the school level.

In order to supplement the analysis of individual and institutional consultations it was decided to organise two face to face National Consultations on Environmental Education in Schools. The First Consultation
on the academic aspects of Environmental Education (EE) in Schools was organised by NCERT on 13-14 February, 2004 in New Delhi. Seventy participants comprising eminent scientists, environmentalists, officials of central and state govt. departments dealing with environment, senior academicians attached to Departments /Centers of environmental studies, environmental science, environmental ecology, botany, regional development, geography, marine biology etc. of different universities, teacher educators, principals of teacher training colleges, prominent Non-Governmental Organisations (NGOs) and NCERT faculty took part in deliberations. The Second Consultation on the Implementation of EE in Schools was held on 13th March, 2004. Seventy-two officials comprising Presidents/Chairpersons of Boards/Councils of School Education, Directors of State Councils of Educational Research and Training (SCERTs), Directors of Education in the states, eminent scientists, environmentalists and NCERT faculty participated. 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. Various issues were deliberated upon in these Consultations through plenary presentation, open house discussion, interaction in groups and consolidation of recommendations.

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. In the detailed discussion that followed it was noted that National Curriculum Framework for School Education (NCERT, 2000) has already made recommendations of far reaching consequences with regard to EE for different stages of school education. Significant initiatives undertaken by the state level agencies in revising their curriculum and syllabus including EE over the years were also highlighted.

Wide ranging suggestions received through consultations include identifying the mission and objectives of EE, initiating proactive action and reforms in curriculum and syllabus, pedagogy and classroom transaction, evaluation, teacher education and implementation strategies.
Role of Environment is Child Development

Development refers to interaction of a child and his environment whose after products alter exciting behaviour and response tendencies is such a way as to increase: (1) their strength, (2) the degree of differentiation and (3) the organization of personality. The teaching learning situations in school generate the environment for the new experiences to alter response tendencies of the children. Thus it refers to acquisition of new behaviour or desirable changes in physical, mental, social and emotional aspects for daily living. It also expands the capacities of the children.

The objectives of environmental education are directly related to the child development. The child development includes physical, intellectual, social, emotional and psychomotor development. This fact has been illustrated here.

The objective of Environmental Education

Aspects of child’s Development and sources

1. The awareness of the environment i.e. (knowledge objective)
   1. Mental development (Home, family and school environment)

2. The development of Skills related to environment (working efficiency)
   2. Psychomotor development (Home, Family, society and school environment)

3. The development of desirable attitude and values toward the environment
   3. Affective development (Home, Community, Society and school Envt.)

The child development takes place in terms of behavioural changes or modification of behaviour. The teaching process in schools creates conducive environment for providing learning experiences to the child. The teacher activities and actions generate the learning environment for the desirable behavioural changes among students. A child lives in three environments- physical, social and psychological simultaneously. Family home, society and school environments provides learning experiences to the child. The psychological environment of a child play a significant role for his working style as well as life style.
(1) **Role of Family Environment:**

The family is the most ancient and original human group, its organization may be different from society. The family is the first school and mother is equivalent to hundred teachers. The family environment provides the education and training for conduct and values of life while the school confines to provide knowledge and information to the student. It provides the individual guidance to a child for social qualities.

The family is an informal educational institution for developing social relations. It has certain responsibilities. It is the prime responsibility of a family to fulfill the primary needs and requirement of a child and create a conducive environment or homely environment for developing social qualities and values among the children.

According *W. Burges*, "The family as a unity of interacting personalities i.e. parents or other family members." It implies the personality development of a child. The personality is broad concept refers to physical, social, emotional, cultural and intellectual development.

This issue is highly controversial among the educationists. *Rousseau* is of this view that evils come from family and society. The child should be kept in natural environment rather than family or social environment. *Emil* book indicates this view regarding role of family and society.

*Frobel* has a different view that family is the first school for a child. It creates most conductive environment to a child for providing learning experiences.

According to *Raymond*, "The family is the place or school which develop the great qualities in child. The quality of deep love and affection feelings are developed. The family environment provides the learning experiences for selfish-unselfish, justice-injustice, truth-lie, labour-carless etc., and to differentiate among these concepts."
The following are the main functions of family -

(1) Family is the first school to develop feeling of security, belongingness and emotional stability.

(2) To develop the ability of adjustment.

(3) To develop, social, moral, and spiritual feelings.

(4) To inculcate the permanent values of life.

(5) To develop the high qualities and values.

(6) To educate for guidance and counseling.

(7) To develop the mental and emotional qualities and

(8) To educate for obedience and discipline.

The family is the place where the old generation or first generation transmits high qualities and values to the second generation. These high qualities are developed informally from the family environment. The family is the nursing place of culture and character buildings.

(2) Role of School:

The term school refers to the place where efforts are made for developing a child. A child should have great devotion in his school. Every school has three type of environment which influences the child (1) physical environment (2) Social environment and (3) Psychological-educational environment.

According to John Dewey, The school has an unique environment where innate qualities of child are developed for life and functioning efficiency in an occupation.

The school is the formal agency where preserved knowledge and experiences are transmitted to new generation and develop the personalities of children.
The following are the main characteristics of a school:

1. The school is the name of specific environment,
2. The school activities are organized to develop the children,
3. The school is the center of a child development,
4. The school prepares youths for a socialized society and
5. The schools are the creator and creator of society.

The Importance of School:

The school is the miniature of the society. It contributes significantly in the socialization of children. Kothari commission of education has indicated the importance of school and classroom teaching in his opening sentence of the commission.

"The destiny of India is being shaped in her classroom."

- D. S. Kothari

Thus, the school contributes in national-developments socialization of a child, developing excellence in functioning of the society as well as nation. The following are the main functions of school.

1. It is means for solving the complexities of the society.
2. The cultural and social values are developed in the school.
3. The purpose of school is to bring the all round development of a child. It has the development oriented environment.
4. The school is the link between home and society.
5. The objectives of school are to develop cognitive, affective and psychomotor aspects of a child.
(3) Role of Community:

The group of person of a place has the same objectives which are realized through cooperative life. It is difficult to plan without cooperative life. It is the second place after home for his socialization. It develops the feeling of we. It has no place for I or me. The members of the community should have the “we feeling sympathy and cooperation” to each other. It is a well organized aspect of society but it is no: a society. The feeling of locality is developed by the community.

The community refers to a general living group which has the common objectives. It maintains all type of relations. It is the result of general life. The members of community do not have the specific goal and selfish motive. It concerns with intensive social life in which human beings are there. They are conscious enough about social objectives and motives. Thus community life generate an environment for the socialization of a child-

(1) The community life creates and appropriate social environment, which contributes in social and cultural development. It develops emotions, sentiments, and characters as per norms of the society. The community process evolves social environment.

(2) It also develops cultural environment for the values of life, and ways of expressing his emotions. It develops conduct and values of life.

(3) The educative process and activities are controlled and organized by the community to meet the local requirements. The educational at programmes and curriculum are designed in view of the future requirements of the community. The educational process is made more meaningful and purposive.

(4) The community organizes informal activities and programmes for facilitating the child for his study by establishing library, reading rooms, museums and play grounds etc.
(5) The community education includes the following affective elements:

(a) The community is a small unit of a society, therefore it contributes in socialization.

(b) The culture means which we follow in our daily life. The community also provides informal educational situations for developing culture and our values. The culture factor influences the community.

(c) The community of today is mainly influenced by politics. It also affects our school functioning. Today’s education is purely educational polities. The political consciousness is provided by the community.

(d) The community development is mainly based on the financial conditions and economic factors. The community should provide some training to the children for their vocations so that they are able to earn their livings.

(4) Role of Social Environment:

The ultimate goal of education is to develop an integrated personality of child. The frame-reference of personality is the society, beyond the society the term personality is meaningless. The heredity and environment contributes in the development of personality of a child. The personality includes physical, social, emotional, intellectual and cultural qualities. Some traits are based on heredity and most of the traits are developed by his environment in which a child lives. The following are main aspects or qualities which are developed by social environment.

(1) Development social conducts

(2) Development of Character.
(3) Social maturity,

(4) Development of self concept and self actualisation.

(5) Group reputation

(6) Feeling of friendship

(7) Feeling of co-operation.

(8) Feeling of nationality.

(9) Devotion towards parents.

(10) Development of moral values and

(11) To help others ie; feeling of generosity.

The social environment develops the higher qualities of life and certain skills which are essential for jobs and occupations. Apart from these personality development, they are provided the awareness of major social and national problem e.g. human population explosion and environmental pollution. It is a fact a child has acquired the awareness and developed the consciousness of small family and its adverse effects on his life from the very beginning of his development. Similarity it is an urgent need to provide the awareness of environmental pollution and to develop consciousness about it. They should know the adverse effects or bad consequence of environmental pollution on his life as well as on society and nation form his infancy to adult age. The objectives of environmental education have been discussed stage wise. It is the responsibility of home, family, school, community and society to provide the learning situation at their own field to provide the awareness of pollutions to develop consciousness about its adverse effects. Thus, social environment may contribute significantly in the development of a child.
2.12.3 ROLE OF GOVT. AGENCIES:

Besides enacting the above laws, the Indian government has also established the following institutions, which are involved in some way or the other in sustainable development in the country.

- Ministry of Environment and Forests
- Department of Science and Technology.
- Department of Agriculture and Cooperation.
- Department of Biotechnology.
- Department of Ocean Development.
- Department of Space.
- Department of Non-conventional Energy Sources.
- Energy Management Centre.
- Council of Scientific and Industrial Research.
- Central Pollution Control Board/State Pollution control Boards
- Central Forestry Board.
- Indian Council of Forestry Research and Education.
- Forest Survey of India.
- Wildlife Institute of India.
- Botanical Survey of India.
- Zoological Survey of India.
- National Land Use and Wasteland Development Council.
- National Wastelands Development Board.
- Indian Board of Wildlife.
- National Museum of Natural History.
- Centre for Environmental Education.
- Institute for Himalayan Environment and Development.

In its effort towards preventing and controlling pollution, and promoting sustainable development the Indian government is undertaking the following activities.

- Water and air quality monitoring stations in selected areas.
- Use-based zoning and classification of major rivers.
Notification and enforcement of standards for polluting industries through the Central and State Pollution Control Boards.

Rules for manufacture, storage, transportation, and disposal of hazardous substances.

Onsite and offsite emergency plans for preparedness against chemical accidents.

Fiscal incentives for installation of pollution control devices.

Ganga action Plan to prevent pollution of the river and restore its water quality.

Identification of critically polluted areas and of highly polluting industries.

As part of sustainable development, the following activities relating to conservation of forests and wildlife are also taken up by the Government of India.

Adoption of a Forest Policy (1988) with the principal aim of ensuring ecological balance through conservation of biological diversity, soil and water management, increase of tree cover, meeting the requirements of the rural and tribal population, increase in productivity, efficient utilization of forest produce, substitution of wood and people's involvement for achieving these objectives.

Under the Forest (Conservation) Act, 1980, stringent provisions for preventing diversion of forest land for any other purpose.

Setting up of the National Wasteland Board to guide and oversee the wasteland development programme by adopting a mission approach for enlisting people's participation, harnessing the inputs of science and technology and achieving interdisciplinary coordination in programme planning and implementation.


Establishment of National Parks and Sanctuaries covering about 4 per cent of the country's area.

Eco-development plans for sanctuaries and National Parks.

Identification of bio-geographical zones in the country for establishing a network of protected areas including seven Biosphere Reserves set up so far.
□ Management Plans for identified wetlands, mangrove areas and coral reefs.
□ Formulation of a National River Action Plan.

To give boost to sustainable development, the Government of India is also paying special attention to land soil in the following ways:
□ Surveys by the All India Soil and Land Use Survey Organization.
□ Treatment of catchment in selected river valley projects and integrated watershed management projects in catchment of flood prone rivers.
□ Assistance to States to control shifting cultivation.
□ Assistance for reclamation and development of ravine areas.
□ Drought Prone Area Programme.
□ Desert Development Programme.

Environmental Impact Assessment is another important activity initiated by the Government of India as part of sustainable development.

□ Establishment of procedures for environmental impact assessment and clearance with regard to selected type of projects requiring approval of the Govt. of India.
□ Prior clearance of projects require diversion of forests for non-forest purposes under the Forest (Conservation) Act, 1990.
□ Formulation of environmental guidelines for projects in various sectors.

Other activities of the government that contribute to sustainable development are:
□ Eco-task forces of ex-servicemen for ecological for creating environmental awareness through non-governmental organizations.
□ Surveys and research studies.
□ Training programmes, workshops and seminars for building up professional competence and for creation of awareness.
2.12.4 ROLE OF NGOs:

Role of Non Governmental Organisations in Environmental Education:

The 9th edition of the World Wide Fund for Nature (WWF) - Indias Directory, titled Environmental NGOs in India - 2008 has been released. The directory, which is a comprehensive information-bank, takes into account Non Government Organisations in all the States and Union Territories working towards environmental protection, conservation and awareness.

It provides vital information about the groups engaged in the cultivation and nurturing of interest in environmental protection and the conservation of nature and natural resources.

There has been a substantial increase in awareness of environmental problems in the country, which has also been accompanied by an increase in the number of Non Governmental Organisations (NGOs) working to promote sustainable development and proper environmental management.

The spectrum of Missions as provided by the different NGOs range from promoting environmental education, conducting awareness camps, safeguarding environment through social mobilization and community participation, biodiversity and wildlife conservation, promotion of renewable energy and various other research activities and movements.

Produced every alternate year, the directory is the single largest information base on NGOs working in the field of environment, sustainable development, and nature conservation in India. This edition carries complete information of almost 2300 NGOs in the country.

Although non governmental organizations have been in existence for a long time, it is only recently that their role as well as their organizational significance is being realized. Their strengths include small size, flexibility of action, high motivation and willingness of their numbers to work with minimal return, dynamism and the capacity of handling issues with sensitivity. Considering the variety and intensity of the societal problems we face today,
one has to appreciate the fact that the government can’t satisfy all the needs effectively. Beside many of our problems need personalized touch which the government is unable to do so. The NGOs are playing a significant role in environmental protection and further their objectives can be strengthened. NGOs with specific aims and objectives have been working with the people and for the people from years together. Their concern is for the betterment of the society in general. These NGOs today have understood the need of the time and are busy in channelising their energies towards environmental preservation.

**Nehru Centre for Environmental Studies at Ahmedabad (1984):**

In Nehru Centre for environmental studies at Ahmedabad, C.P. Ramaswami Iyer Institution for southern states in 1988 and Rashtriya Paryavaran Jagruti Abhiyan in 1986 were established. These Institutes undertook a responsible task to train the resource persons to teach Government officials and people from Voluntary organizations. Training was given in regional languages also.

**World Wild Life Fund-Indian chapter (1976):**

This organization along with its regional sister concerns undertook the task of teaching young environmentalists. They provide information as well as material to children who ask for it. Varied youth organizations have forums to carry out awareness programmes, train resource persons and carry out varied campaigns related to conservation of natural resources. These forums activated people towards becoming environment conscious. India too has a long history of the work done by the NGOs towards protection of the nature, conservation of forests and wild life.

**Chipco Movement:**

Mass Scale falling of trees to build Kosi Dam in the Terai region of Gadwal disturbed its ecology. Sunderlal Bahuguna an eminent scholar environmentalist and a staunch activist founded and headed the CHIPCO organization and the movement. This organization looks into the problems of the people there, rehabilitates them, gives them means of livelihood. This
organization is active in the Alaknanda river valley and Terai regions in Gadwal.

**Vanrai Project:**

Vanrai is another such organization which carries out multiple activities in Maharashtra with conservation of forests as its base. Sri Mohan Dharia, former central minister and active environmentalist established this organization in 1986. He believes that a balance has to be maintained between man, animals and nature development. Creation of environmental awareness is one of the major activities conducted by the organization. More attention is paid to utilization of local man power and local material towards creating as unsustainable economy with sustainable environmental preservation.

**Silent People’s Movement:**

Silent People’s movement of Rajasthan, Greening movement of Kerala, and Paryavaran Sanrakshan Manch of Maharashtra have tried to combine business while stopping the environmental degradation. Work, job satisfaction and monetary gains of the local people are looked after by these activists. In doing so, they also green their surroundings and protect ecology.

**Gyan Prabodhini:**

Gyan probodhini, Pune encourages students to carry out surveys in this field. This organization was the first one to start a project Nirmalya Prakalp and it’s success encouraged many others to follow it.

Baba Amte will well be remembered for his Anandvan and Medha Patkar who is single handedly fighting for Narmada Bachao Sangathan. Maneka Gandhi is another crusader who is doing her best for the animals in collaboration with Society for Prevention of Cruelty against Animals (SPCA). Justice M.C. Mehta, the Magasaysay award winner and his court of justice. Various non-governmental organizations are working with school children. Environmental education has emerged much after the issues and problems in environment were recognized and debated the following paragraphs discuss
emergence of environmental education. Apart from the non governmental organizations the government both at the national and international level has made efforts to improve the environment.

Non-governmental Organizations (NGOs) have for a long time debated and questioned the direction of industrial development that is resulting in unsustainable development. They are inspired by Mahatma Gandhi's assertion, "Nature has enough for everybody's needs, but not for everybody's greed."

Because of the pressure exerted by the NGOs, the government established ministries and agencies to clean up the mess created by indiscriminate industrialization and the resultant economic growth. But much of their work related to controlling the damage rather than preventing the damage. For example,

- Greenpeace India, in April 2003, succeeded in forcing a multinational company to take back 1416 drums filled with 290 tons of hazardous mercury waste from its thermometer factory in Tamilnadu to the United States. This largest hazardous waste transfer from India marked the end of a long struggle by the locals and environmental NGOs charged that mercury vapour released from the factory ruined the health of the workers and the community and caused lasting carnage to the environment during the factory's 18 years of operations. The management of the company at last, arranged to ship the hazardous mercury and related wastes back to the United States. The consignment including glass cullets, finished and semi-finished products and sludge left Tamilnadu and headed for the hazardous waste recycling firm located in the US.

Lobbying and advocacy is the primary and central objective of NGOs, especially in India. It is here, that networks associations and institutions become critical for effective and sustained advocacy on environmental issues.

An environmental group, Eco-Greens focuses its efforts primarily on protecting the natural world from toxic wastes, radiation, air pollution, and other hazards, as well as promoting eco-development that is the use of renewable-resource technologies for energy and industry.
The Greens in Germany are another dominant group taking up environmental concerns. According to this group, which focuses on Green politics and calls for a new world order, “The worldwide ecological crisis worsens from day to day; natural resources become more scarce; chemical waste dumps are subjects of scandal after scandal; whole species of animals are exterminated; entire varieties of plants become extinct; rivers and oceans change slowly into sewers; and humans verge on spiritual and intellectual decay in the midst of industrial consumer society. It is a dismal inheritance we are imposing on future generations.”

Greenpeace, the largest international environmental group, aims at educating the people on the connection between militarism and ecological damage. It is a fact that military maneuvers directly endanger the environment. This group conducted a number of public actions to educate people about the dangers of new missiles.

NGO community is relatively small in its distribution as environment is a new phenomenon in India. There is not much variation in activity between national, regional and local NGOs. The environmental activities taken up by these NGOs can be listed as follows:

- Study, research and survey work
- Seminars, workshops and symposia
- Documentation, publication and clearinghouse facilities
- Formation of groups
- Training and awareness creation
- Protest actions
- Protection and conservation activities
- Legal aid counseling
- Monitoring

A large number of the NGOs working in the field of environment and sustainable development are, however, involved in education, awareness creation, training and research. Only a few of them are taking up campaigns against deforestation, pollution, large dams etc. Not many NGOs are working on problems like river drainage systems, population control, the impact of liberalization policies on environment and so on.
Unfortunately, even if some of the NGOs are keen on adopting a more integrated ecosystem-based approach, they face too many hurdles in executing these programmes. Some of these obstacles are:

- Lake of scientific inputs
- General apathy of the society be it government officials, politicians or people
- Interference and resistance from vested interests
- Low participation of people
- Funding that is not encouraging

Many NGOs involved with environment and sustainable development in India, have been working various issues. There were numerous local protests against land being submerged by large dams; against pollution of watercourses, rivers, and lakes etc. Movements against Tehri project in Uttar Pradesh and Sardar Sarovar Project across River Narmada exemplify the grit and determination of the NGOs involved with sustainable development.

The environmental movement in India started with Silent Valley Movement in Kerala, where in Kerala Shastrashastra Sahitya Parishad, an NGO, working on science education deputed a multidisciplinary team consisting of a biologist, nuclear physicist, and electronics engineer, an economist and an agricultural scientist, to study the feasibility and impact of this project and declared that if the dam were to be built the first calamity would have deleterious effects like destruction of shoreline, vegetation and the disappearance of several precious species of flora and fauna. This movement, the first of its kind in India, revealed the following:

- There is a difference between academic knowledge and the day-to-day experiences of the people.
- Alternatives have to be considered, and publicized to protest against a particular option.

Kerala State government and the Kerala State Electricity Board that promoted the Silent Valley Project based their propaganda on the fact that the dam would provide electricity, irrigation, jobs etc., and the people in the adjoining districts firmly believed that the Silent Valley Project would be a panacea for all their problems.
2.13 EE AND LEGISLATION:

The Indian government has enacted certain laws for environmental protection and Sustainable Development. These are:

- The Environmental (Protection) Act, 1986.
- A Notification on Coastal Regulation Zone, 1991.

2.14 EE-TYPES AND OBJECTIVES (FORMAL & NON-FORMAL EDUCATION):

The international Conference of UNESCO (1977) held at Tbilsi, formulated the following objectives for both formal and non-formal education at all levels:

1) To develop an awareness of environment and sensitivity (feelings and attitudes) to the total environment and its allied problems.
2) To help in acquiring knowledge and variety of experience of the environment and associated problems.
3) To develop a basic understanding of structure, processes and problems of environment and interdependence of environmental components.
4) To help in acquiring skills for identifying and solving environmental problems.
5) To develop attitudes, asset of values and feelings of concern for the environment and encouragement or motivation for active participation in protection and improvement of environment.
6) To provide an opportunity for an active participation or practice at all levels in working for the solution of environmental problems.

7) To develop an ability for evaluating environmental components and educational programmes in terms of ecological, economic, social, cultural, aesthetic and educational factors.

2.15 ENVIRONMENTAL EDUCATION AND MASS MEDIA:

Environmental awareness is provided through instructional materials. The instructional material is designed by the experts or teachers for different levels of teaching-learning situations. The methods and effective presentation of the content, but the main purpose of teaching learning is to communicate the content with the help of appropriate media or multi-media approach. The word of mouth media is limited to size of students and distance between teacher and taught, but print and non-print them. The need of the day is to provide environmental awareness and understanding to the general mass of people. The multi-media approach is used by the government and non-government organizations for the awareness of environmental problems.

The introduction of media has evolved an alternative system of education, is known as distance-education. The print media used in correspondence education. Non print media, i.e., radio and television is used in distance-education.

The point is that every one of us needs to be educated environmentally because every one of us has the potential to destroy environment even though it may be at micro-micro level. Let us remember that at some stage micro level becomes macro level. If the individual sensitized, the society and the government are sensitized, after all what is a society or a government, it is but an extension of an individual. It is here, mass media will be of biggest help.

Sensitizing the people about environment, is one of the surest ways to save environment, particularly if they develop a stake. Besides, involvement of people can act as an early warning system, and public reaction for specific environmental issues, would be available to the government of the day. Here non-governmental organizations can play a very distinctive role.
Second point relates to the perceptions of the target groups. These vary a lot. The perceptions of tribals of adivasis who, more often live in harmony with nature, are far different from slum-dwellers or urbanities, who, without their realizing, are in constant conflict with nature. The perceptions of a villager about firewood, which he collects daily from the forests to keep himself warm and for cooking his meal are far different from a planner. Similarly, the perception of a villager who lives just outside a National park under constant threat of being attacked by a tiger, is far different from a person who has been a shikari all his life but has now turned a conservationist because he has left hardly any tigers to shoot. All these aspects have to be taken into account when we design a media campaign to save forests and the wildlife.

Thirdly in this country, our task is indeed both very complex and stupendous on account of our diversity. India is a living museum of ecological diversity, and there is not an ecological situation that is not found in India from tropical to arctic, and everything in between. There is, therefore, considerable location specificity in environmental matters in India on account of varying ecological situations, superimposed on which are the socio-economic and cultural considerations. Therefore, any one environmental package will not work, although broad principles may be the same. The locational considerations based on material relevant to the region must enter such a decentralized approach. Thus if we want to reach the people at large, we cannot have just one module, one message, or one language, but multiplicity of these.

The widening TV network, particularly colour TV can be of immense help in mass dissemination through the length and breadth of our country. This also opens the possibility of using video programmers and in turn would lead to the development of software and training. Programmers as also national hook up on environment. In the latter case, serials, with some sort of a central and continuing character(s), could help to disseminate some common environmental messages. However, from the extent of circulation and readership of newspapers, number of TV and radio stations and sale of sets
etc. it is clear that our media are not as yet truly mass media. We have to go along way to make them so as also make them people’s media.

Fourthly, India is predominantly rural in character, and in a village the two most influential people who are generally listened and heard are the Head Master of the school and village Headman. In absence of the location specific programmes at the village level and mass media reaching every individual, let us not forget the importance of the spoken word in the Indian context, word of mouth is still relevant, like the bullock cart which still hauls substantial volume of goods in comparison to haulage through rail, road and air. Word of mouth makes the campaign very personal because side by side you can discuss and remove your doubts, if any. This is not so in media like TV or radio which are impersonal. It may therefore, be better to sensitize the teachers, village level extension workers, farmers, etc. in the first instance. We need to train them because all of them are essentially oral communicators. The conclusion that emerges is that in view of the diversity inherent to the situation, while encouraging mass India like TV and radio, we should not ignore the importance and relevance of the spoken word. That the original decision on silent valley was reversed, shows the power of the traditional methods (newspapers, magazine, etc.) including the word of mouth.

Fifthly realism demands that a mix of traditional media involving low technology and modern media using sophisticated technology need to be used to spread the message of environment, rather than depend on only one of the methods at the expense of all others. Under the Indian setting each medium has a role to sensitize different category of target groups. Spoken word and pronto media will not disappear in India in the foreseeable future even with the emergence of powerful and modern technology like TV and radio. Let us not forget India is both developed and developing at the same time. It is a rich country with poor people.

Sixthly environment is still a grey area and we are all in a learning phase.
Lastly, one can point out the Indian environmental ethic is of harmony and not conflict with nature. We need to blend this ethic with modern science and technology. If we approach environment through this route, it would indeed appeal to our people.

2.16 EE AND ENVIRONMENTAL PROBLEMS:

Population Explosion:

The world population is the total number of living at a given time. The estimated total population of the world is 6,756,200,000 as on 11-2-09 (Ref: U.S. Census Bureau, Population Division).

The 2008 rate of growth has almost halved since its peak of 2.2% per year, which was reached in 1963. World births have levelled off at about 137-million-per-year, since their peak at 163-million in the late 1990's, and are expected to remain constant. However, deaths are only around 56 million per year, and are expected to increase to 90 million by the year 2050. Since births outnumber deaths, the world's population is expected to reach nearly 9 billion by the year 2040.

The villages are gradually depopulated and squatter settlements, slums and shanty-towns, notorious for vice criminality, prostitution, squalor, poverty, insanitation and disease etc., are on the rise. Thomas Robert Malthus (1926) in his 'Essay on the principle of population' had warned that rapid population growth is the real cause of poverty among nations. Paul Ehrlich (1972) had identified population explosion to be at the root of all forms of environmental degradation.

Water Pollution:

Eighty per cent of all diseases in human beings can be attributed to polluted water. In India 70 per cent of available water is polluted water. (Basu, 1986) Industrial effluents, sewage, garbage, bio waste, chemicals of many kinds including artificial fertilizers, pesticides, herbicides, detergents and even animal carcasses mix with water making it unsuitable for human use and
disrupt aquatic ecosystems. Sea water is being polluted by ship wreckage, eruption of under sea volcanoes, and due to oil drilling in sea berths.

Air pollution:

Emissions from factories and industries, automobiles exhaust, rail engines, airplanes, and other internal combustion engines that burn fossil fuel, thermal power plants, quarry and mining activities, nuclear fallout's, dust and particulate matter etc., pollute the air. Breathing polluted air causes respiratory diseases like tuberculosis, bronchitis, allergy, emphysema and aggravates asthma.

Acid Rain:

Air pollutants like oxides of sulphur and nitrogen react with water vapor and oxygen in the air to form Sulphuric acid & Nitric acid respectively. These acids fall to earth either in the wet form with rain water and in other forms of precipitation or deposited as dry gases. Acid rain turn water in lakes and rivers acidic, thereby reducing the size and diversity of fish population. Vegetation is destroyed. It causes corrosion of outdoor equipment, building and works of art especially in urban areas. Acid rain also leaches nutrients from soil reducing its fertility.

Smog:

Due to temperature of inversion effects, sometimes, smoke, sulphur dioxide and carbon monoxide and other effluents of fossil fuel combustion, mix with cold fog to form smog. Smog is highly toxic and harmful to life. During the 1950s some 4000 people were killed due to smog in London.

Greenhouse Effect:

The glass of a greenhouse allows sunlight to stream in freely but blocks heat from escaping, mainly by preventing the warm air inside the greenhouse from mixing with outside air. In a similar fashion gases like carbon dioxide, methane, water vapour, oxides of nitrogen, chlorofluorocarbons (CFCs) emitted from different sources on earth are
transparent to incoming solar radiation but trap heat near the surface of the earth by more efficiently absorbing the longer wavelength infrared radiation released by the earth. This results in global warming up and the phenomenon is called greenhouse effect.

Mathematical models show a modest increase between 3.0 degree centigrade and 5.5 degree centigrade in earth’s surface temperature. Change in precipitation and temperature could threaten natural ecosystems. Agricultural production and human settlement patterns.

Depletion of Ozone layer:

The ozone layer in the stratosphere extending between 25-35 kms, in the atmosphere serves as a shield protecting the planet from harmful effects of ultraviolet radiation’s. This layer is however thinning out due to the widespread use of a group of chemicals called chloro fluoro carbons (CFCs). These chemicals are used in aerosol sprays, refrigerators and room air conditioners as refrigerating liquid and in blowing of plastic foams etc.,

Noise Pollution:

Automobiles, trains, aeroplanes, industry, machinery, factory sirens, market places etc. Are the major sources of noise pollution. A jet engine during take off produces noise pollution of highest degree. It has been observed that on exposure to rock music guinea pigs suffer loss of hearing. Continuous exposure to rock music guinea pigs suffer loss of hearing. Continuous exposure to high levels of sound (those exceeding 90 decibels) results in emotions distress, rise in blood pressure, tension, increased heart beat and may lead to loss of hearing.

Radio Active pollution:

Radio active emissions like Alpha, Beta, Gamma rays and Neutrons emitted from accidents in nuclear power plants, atomic explosions, nuclear testing, radio isotopes, radio active wastes of unclear reactors, X-ray machines
and even picture tubes of television, electron microscopes and cell phones are sources of radio active pollution.

**Deforestation:**

Forests are vital to human existence as they provide fuel, fodder, timber food and medicine. They also check soil erosion, clean air by using up carbon dioxide in photosynthesis help in rainfall, serve as wind breakers during storm and cyclone in coastal areas, provide habitat for wild animals and above all provide recreation for mankind. National Forest Policy stipulates that on the average 33% of the land area should have forest cover. But forests are continuously being denuded to meet increasing demand of people for grazing of live stock, timber, fuel, agriculture, shifting cultivation, urbanization, mining, quarry operations and for construction of hydroelectric projects, hill roads, industries.

**Extinction of Species:**

As per International Union for Conservation of Nature and Natural Resources (IUCN) report India has about 45,000 species of plants and 65,000 species of animals out of nearly 5-10 million species are required for preservation of gene pool so essential, for our survival. In discriminate hunting of animals have also resulted and accelerated species extinction. The present species loss per year is 10,000 times greater than the naturally occurring background extinction rate that existed prior to the appearance of human beings. “The Red data Book” of IUCN and the ‘Greer Book’ of Botanical Survey of India enlist endangered/rare species. Launching of Man and Biosphere Programme (MAB) and ‘World Conservation Strategy’ have helped conservation of species through “in situ” and “ex situ” methods.

**Depletion of Natural Resources:**

The Natural resource of the earth, particularly the non renewable ones like fossil fuels and minerals are being depleted at a fast rate causing severe concern, since their regular supply is vital for sustainable development. By 2000 AD all silver mines and easily mined earth is like a space ship with
respect to its being non sustainable. It may be self extinguishing if it exhausts the natural resources on which it depends.

**Land Use:**

Due to demographic pressure land is under stress, on account of agriculture, industrialization, urbanization, railways and highways etc., in our country extreme imbalance in land use can be seen. Soil fertility is going down as a result of excessive use of chemical fertilizers, nitrates and in some cases by excessive irrigation.

**Soil Erosion:**

About 175 million hectares of land constituting 53 percent of India’s total land area is susceptible to serious soil degradation due to desertification, salination, alkalination, water logging deforestation and overgrazing. The country loses about 5-6 thousand million tons of top soil every year at a rate of 10 tons/year. At this rate the entire top soil may be lost in about 250 years (Kanwar, 1978) Without top soil, which has taken several hundred years for its formation, land becomes barren and is the starting point of desertification.

**Energy Crisis:**

Energy is required for cooking, transport, running industries and lighting buildings and the streets. Although per capita consumption of energy in developing countries is 4-7 times less than developed countries, rapid growth in energy consumption is now occurring in these countries compared to developed countries, since these countries are seeking to industrialise to raise their living standards.

**Ecological Disruption:**

The subtle and fragile relationships in an ecosystem can be disrupted due to external factors like human intervention. Any change in an ecosystem that is imposed form outside often triggers off a chain of reaction that dismay sometimes be irreversible. All the environmental problems described above are cause as well as manifestation of an ecological crisis in environment.
Extinction of 'Dodo' birds and the threat from hydro electric power projects are two classic examples that amply illustrate the ecological imbalance due to human intervention. Introduction of high yielding cereals, large scale monoculture and introduction of wide spectrum of insecticides etc., have exacerbated the ecological crisis.

There are number of non governmental organizations working in the area of Environmental Education. They try to bring awareness, build an understanding, inculcate an attitude towards environmental issues and their solutions, they also initiate action with the help of law.

2.17 EE – PRESENT STATUS :

Present status of Environmental Education:

The review committee (1977) on “Curriculum of Environmental Education” has stressed the need for more environment based education. The committee has recommended that curriculum of physical and bio sciences and life sciences should be made environment oriented with emphasis on environmental problems.

The EE content is inter disciplinary in nature. Therefore, it can be adequately designed and included in the course curriculum of teacher educational programs. The review of courses indicates that main emphasis has been given on physical and biological components of the environment. The problems, interrelationship and interdependence of these components have been emphasized in the environmental studies. The main focus of environmental education is to improve the quality of environment and also the quality of man. It involves-physical, social, biological and cultural environment. The organizational climate of a school is the significant factor which contributes in the development of child personality.

A Center of Environmental Education has been set up at Ahmadabad where the educational teaching material and aids are developed. Audiovisual materials for media mobile exhibitions are organized by the experts. The regular courses are organized for various institutions imparting training senior
executives and administrators. The foundation course are developed for Civil Service candidates in their area of work.

Department of education has established two Centers of Excellence in the country. They generate knowledge and methodology of training in the areas of Tropical Ecology at Bangalore and Environmental Education at Ahmedabad. The education department has prepared guidelines to help in sound rural development of youth. The main purpose is to identify root cause of ecological problems as related to human activities and solve the local environmental problems.

Environmental Information System was setup in 1982 under the department of Education Plan Program. There are ten such centers and diverse areas of environment, established in specialized institutions in the country.

There are more than 200 non-governmental organizations which are engaged in environmental education awareness and training youths and different areas such as pollution control, rural development, wild life conservation, aorestation, floristic & faunal studies, waste utilization and eco development.

Recently the university departments are organizing seminars and workshops on EE to develop the course content for teachers education programs. The board of studies of the Universities are planning and designing the course content which is to be taught to the students of Education. The course is to be designed at two levels – first is the “Core course of environmental education”, and second is the “Specialized course” related to physical and biological sciences content. The core course of EE is compulsory for all B.Ed. students and specialized course content is the part of teaching methodology course.

2.18 ENVIRONMENT AS A MEDIUM OF LEARNING:

It is right to say that a primary school child has been so much burdened with books that he has no time to enjoy the thrills of childhood. He was made to work on his books as though he is an adolescent and is forced to scamper around fun and frolic without actually participating in them. How sad his plight is still more pitiable if he studies in school early in the morning and
returns home late in the afternoon soon after that, he hurriedly eats his victuals 
and goes straight to study for as he has a lot of home work to finish.

At the class I to IV level children would acquire knowledge in an 
incidental and informal way and would be able to retain it permanently 
contrasted with this cramming difficult words given in the science and social 
studies books does not result in permanent learning. Moreover learning 
through environment is very enjoyable and fruitful. One other benefit that 
would learn many desirable attitudes and would also develop observational 
skills and scientific approach.

Children in class I to IV therefore should be taught only literacy and 
numeracy and that too for part of the school day for the rest they should be left 
to play or taken out an excursion to a nearby grove, cornfield, form, river or pond and observe animals, fisher, birds, p.ants, flowers etc. this would not 
only help children study many things about their environment but would also 
give them an opportunity to walk in the open to breathe same salubrious air, to 
watch the shimmering rays of a genial sin or to hark at a kohl singing form the 
branch of a blooming tree. Believe me all this is learning much better and 
more permanent than the lessons included in the present books of science and studies.

These observations would help children acquire knowledge according 
to their felt needs knowledge which would not stifle or stultify their originality as book learning most often does: pupil while on excursion are free to dart 
from one object to another and examine and explore it and discuss about it. Thus excursion substitutes passive receptivity of the class-room with joyful experiential and active learning.

The teacher may also use this occasion to help children learn new 
words which describe man and his environment. This opportunity can also be 
used for teaching children literature on nature prescribed in their course.

Beside the teaching of children literature there are many other learning 
out comes attainable through the exploration of environment; one very 
important among them is the development of the senses and sensibilities of the 
child. Apart from senses, children’s sensibilities also develop while they 
observe their environment the beauty of nature. Sensibilities develop in them 
because the children experience the beauty of nature and not read about it
within the leaden walls of a placid classroom and this experience is the 
backbone of their emotional development, for emotions cannot be taught like a 
geometrical theorem a chemical formula or any cognitive paradigm. Emotions 
relate to heart i.e. to feelings and therefore, the methods of developing heart 
that develop emotions and sensibilities. And when one's sensibilities have 
been developed one would lead a happier and contented life.

One other important objective of studying the environment is that 
student can learn through it a lot of Botany, Zoology, Sociology, History and 
Economics. There are trees of one or the other kind in energy part of our 
country. They may also later learn the economics significance of trees and 
forests in our daily life in terms of fruits, medicines, timber and other products 
such as rubber etc. obtained from them. Similarly, students can learn a lot 
about different animals and birds.

The environment is thus used to learn 'from' and 'about' it. The 
concepts of established disciplines are closely related to the environmental 
observations. This is also known as environmental approach and also includes 
the development of (i) positive attitude towards environment and (ii) 
environmental awareness (Saxena et al. 1983). In this approach, environment 
serves as a laboratory and a resource center.

2.19 EE AS A DISCIPLINE AND NEED :
“Environmental Education” has been discussed thoroughly at several 
National and International Seminars , Workshops and Conferences . The 
eminent educationists have recognized the urgent need of Environmental 
Education, but only some have clear idea, meaningful purpose and 
understanding . Environmental education is inter-disciplinary in nature 
which can be resolved by employing inter-disciplinary approaches. 
Therefore, the concept of discipline, rationale for environmental education and 
its content have been discussed as under.

Meaning of discipline:
A discipline in the generally accepted sense means “a field of study 
which has a well defined content and technique of its own together with a 
unique system of values”. It is implicit in this concept of a learned discipline
that its constitute an important part of man's cultural heritage and that its pursuit results in a specific enrichment of the human mind. When new directions of thought emerge from man's struggle, efforts with life and environment through his creative mental efforts and acquire in time a degree of stability in a new discipline, but during the course of its development it involves its own distinct characteristics and acquire status in the intellectual world. Some times two or more branches of knowledge merge at their upper reaches and this merger at the highest point works downwards to the lower levels and may even alter the whole pattern of the parent discipline or disciplines. The newly involved pattern sometimes proves its validity in practice and may become a nucleus for a new discipline.

There may be a social and professional activity which on account of its importance becomes an area of application for several disciplines and this common area in course of time may come to be recognized as an independent field/discipline of study.

Characteristics of a discipline:

Every discipline has some specific features by which it may be distinguished from others. Every discipline has the following characteristics:

1) Own content
2) Related professional and social activities
3) Own method of study
4) Own field of research and
5) Own methods of research

Rationale for Environmental Education as a discipline:

Environmental education is a powerful instrument to maintain ecological balances that equips human beings with awareness, knowledge, skills, attitudes, and commitments to improve the quality of environment.

EE has its own independent content like other disciplines. The following structure of discipline of the EE would appear to emerge:
1) **Concept of Environmental Education**: It comprises of concept of education, environment, its components and meaning of environmental education and relationship with other subjects and EE as a discipline.

2) **Ecology and Environmental pollution**: It comprises of ecology, ecosystem, quality of environment (Pollution and degradation), environmental pollution, human ecology and environmentalism and interdependency in environment (food chains, food web, flow of energy and bio-chemical cycles)

3) **Educational and psychological environment**: It includes concept of educational environment, growth and development, psychological environment & mental health and population explosion and environment.

4) **Environmental management**: It includes meaning of environmental management, teacher (education and EE, role of media in EE, social forestry and EE, problems and remedies of EE and evaluation of environmental education (EE).

The core content of EE is highly inter-disciplinary in nature but difference lies in the level of objectives. The purpose of other subject is to provide the awareness of environment and environmental studies, but environmental education has to develop cognitive, affective and psychomotor abilities and efficiencies.

2.20 **TEACHER TRAINING PROGRAMMS FOR EE**:

The fact that there is a need for teacher training in E.E. and E.A. has been emphasized many times (UNESCO 1981; Saxena 1983) This is due to the fact that E.E. is basically interdisciplinary and applied in nature. Dealing with interdisciplinary problems is something new and it requires different kinds of skills. Perhaps it will require a different kind of teacher training programme for the new teachers and an orientation programme of those already in service. In this type of programme, first of all a kind of sensitivity towards environment is to be aroused. Secondly, the teachers are to be exposed to the classroom. These coupled with emphasis on the use of software
and hardware, are necessary elements of such a programme. It may be relevant to point out here that such programmes concern teachers of all the subjects related to basic sciences and social sciences. The other implications are related to change of curriculum, methods of teaching and evaluation tools. With regard to curriculum, it implies its development according to local environmental needs and problems. The objectives of such a training programme may be summarized as:

1. To improve upon the existing environmental awareness of the participants.
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 problem.
4. To provide training in dealing with environmental issues in the class by (i) translating the implications and (ii) developing environmental awareness.

It is suggested that an in service E.E. programme must have the following characteristics (Mitzel, 1982):

❖ The programme should deal with basic science as needed but it should not be science dominated.
❖ It should be appropriate for teachers with a wide variety of backgrounds and interest.
❖ It should encourage teachers to environmentalize their teaching.
❖ It should have a strong motivational impact on the participants.
❖ It should bring teachers into direct involvement with the particular environments under consideration.
❖ It should make a serious effort to envisage teachers in exploring their personal assumptions, values and feelings about society and self and the relationship of these to the natural world.
Sutman (1980) propagates five principles on the basis of which teacher-training programmes may be developed and organized. These are:

❖ Experience related to an understanding of practices that will assure better the survival of the human race and improvement of their quality of man's environment must receive high priority in all.

❖ Appropriate basic content from the natural and social sciences must be understood before the teacher can deal effectively with environmental concerns. This means that environmental emphasis should occur towards the end of the pre-service teacher education programme.

❖ The teacher education programme should include appropriate content and experiences to develop and understanding of some environmental concepts, it should not be developed of the assumptions that all the environmental concepts have been developed earlier.

❖ The time of teacher education programme should be together of ideas and a consideration of how environmental issues can be incorporated into the school curriculum.

❖ It should include additional experience related to the survival of technological society and to the human race in general.

Taking these as guidelines, teacher-training programme may be chalked out and implemented. Various modes of training have been used, which are (Saxena, 1983): (i) Face to face training (ii) Self-learning Modules. (iii) Mass Media (iv) Correspondence Course.

It has been suggested that such programmes may be woven around some themes. Some workshops on environmental approach of teaching have been organized at Regional College of Education, (NCERT), Bhopal during last few years and by many other organizations such as SIE's. Sarla Rajput (1985) emphasizes approach, where as Mukhopadhyay (1983) lays down a detailed criterion for choosing the effective strategy.

The Indian Context:

It can be seen that Environmental Education, Environmental studies and Environmental approach all three are important but in different contexts. E.A. is important to help achieve universalization of education. It gains more
importance when we encounter the physical facilities available in the schools. We are aware that majority of schools have little or no equipment available and they have to bank upon local resources and community. In such a situation E.A. is the only meaningful and sensible answer for promoting functional education. This approach is likely to succeed because the requirements of primary education are vast and E.A. does not need much additional resources for its implementation. Any approach that does not take into account the realities of the situation is not likely to succeed. The other important feature of E.A., as has been pointed out earlier, is that it can also be adopted with the existing syllabus. The only change we need for its successful use is the change in the thinking of the teacher. Once the teacher is convinced that he and his environment are the best resources at his disposal, the purpose is half served. What remains is his orientation in the skills that are employed in use of Environmental Approach.

Developing positive attitudes towards environment is easy at primary level as it is formative stage for the children. This can be achieved by relating concepts with environment as is done in E.A.. Trees, river, local places of historical importance can easily be related to various concepts of science and social studies. At higher level of education one tends to take more generalized view of the things.

E.E. has rapidly gained importance because of deteriorating environment including deforestation, pollution of water resources, increase of sulphurdioxide, carbonmonooxide, carbondioxide and other harmful substances in air, decreasing layers of ozone and depletion of basic resources. In the past it was through that EE is relevant to the big cities only. Now it has been realized that problem of environmental pollution and depletion of resources in not limited to cities only but encompasses rural areas as well.

The only difference is in the nature of problems. The inclusion of ingredients of planning and management are important for policy makers and plan enforces, whereas the general public requires information necessary to encounter every day problems. This kind of information shall generate environmentally literate citizenry. Perhaps as we move up in education from primary to secondary and so on, EE has increasing importance. Whereas the importance of EA and EE at lower level is that it requires the application of
fundamental principles of different subjects such as Physics, Chemistry, Biology, Statistics etc. For example, impurities of water can be detected, their extent measured and impurities be removed using principles of Chemistry, Mathematics and Biology.

Emphasis on EE means tackling of the problem at various levels such as development of curriculum for colleges and universities, training of specialists, teachers and teacher educators developing non-formal adult education programmes and finding appropriate solution of environmental problems. Chiras (1982) deals with three models for analyzing environmental issues. These are (i) population Resources / Pollution, (ii) cause and effect analysis and (iii) Ethical analysis. On this basis, the risk of environmental issues can be assessed. It is emphasized that EE is not against development but for its proper management.

**Teacher Education – Recommendations of NCERT:**
EE has to be a prominent part of the foundation component and also an elective subject in all pre-service teacher education courses.
A detailed design of in-service programmes covering various aspects of content and methodology, competencies to transact the subject, to prepare the teaching-learning materials, to evaluate the learning outcomes need to find place in the agenda of District Institutes of Educational Training (DIETs), Colleges of Teacher Education (CTEs), Institutes of Advanced Studies in Education (IASEs) and State Councils of Educational Research and Training (SCERTs).
Appropriate design of in-service teacher education programmes through open, distance and online learning modes will have to be formulated to cover large numbers of teachers located in rural, tribal and remote areas.
The teacher education methodology has to emphasise competencies to participate in interactive group discussions, problem solving sessions, contextual transaction of the content, demonstration-cum-discussion, concept-centered teaching and experiments, project work, conduct of co-curricular activities, field study, and the use of information and communication technology including multimedia. In addition, the student-teachers need to acquire skills in organising exhibitions on various environmental issues,
undertaking action research on environmental problems, conducting field and laboratory observation, undertaking case studies of innovations, disseminating the success stories and using school-based and community based approaches. Use of low-cost/no-cost materials available in local environment, audio-video materials, materials related to information and communication technology have to be encouraged in schools depending on the facilities available.

2.21 EE AND SCHOOL CURRICULUM :

Making Environmental Education as part of School Curriculum:

The following are the factors that support the inclusion of Environmental Education as a part of school curriculum:

1) Environment Education facilitates learning experiences from simple to complex. When children look at a bird, they see its multi-coloured plumage, eating figs, insects etc., flying and so on. This makes them aware of the habits of birds. Similarly they can see other phenomena like rainbow, stars and learn several facts. In this process of proceeding from simple to complex, children learn different aspects through the medium of Environmental Education.

2) Environmental Education helps children to proceed from abstract to concrete ideas. When children learn about valleys, ravines or gorges, from books, they imagine things and only have vague or abstract ideas about these aspects. But when the children are shown the hills, they can see valleys, ravines or gorges for themselves, and have a definite or concrete view about these things. Similarly, when children are told about different trees, they can only visualize in different ways and have a vague idea about these trees. But when these children are shown these trees, they have a concrete view of these trees.

3) Environmental Education facilitates learning experiences from the empirical to the rational. Children can observe a phenomenon, touching, feeling and testing it empirically and draw their own conclusions and rational explanations. For instance, they may check a number of Banyan trees and Neem trees and then conclude that the
leaves of the Banyan trees are simple while the leaves of the Neem trees are compound, with both having chlorophyll. They can also conclude that plants make their own food in the presence of sunlight (photosynthesis), and that sunlight is essential for the survival of plants.

4) Environmental Education enables the children to conduct their own investigations and draw their own conclusions, maximizing the habit of self-instruction and discovering things for themselves. Children, on exploring, observing and assessing the phenomena around them not only engage in self instruction, but also have the feeling that they have discovered something new, and enjoy it.

5) Environmental Education programmes give a lot of excitement and pleasure to the children. This can especially be seen when the children’s faces light up while picking up flowers and insects. In short, Environmental Education brings a lot of joy to the students.

**Environmental Education & School Curriculum**

Environment education in schools can be taught either as a separate subject or could be integrated with other subjects, as it is an interdisciplinary subject. It should cover the natural world, the social world as well as the physical world. While the children should be made aware of the physical world. While the children should be made aware of the environment in the primary classes, technical knowledge and practical training should become part of the environmental education in the higher classes. As environmental education is an interdisciplinary subject, it would be ideal if it is integrated with the other subjects. This can be achieved by integrating it with the following subjects in the given manner.

**Chemistry**:

**Water**: Pollution, deforestation, population explosion, water scarcity and exploitation of groundwater.

**Air**: Air pollution, role of trees in checking air pollution through production of oxygen, greenhouse effect, ozone layer depletion, acid rain, nitrogen cycle, role of industries in air pollution.
Botany:
Role of trees in pollution prevention, checking ozone depletion, preventing soil erosion, growth of economy, natural processes of controlling pests and use of chemical pesticides.

Zoology:
Wildlife- its protection and preservation, need for conservation, food chain, biodiversity, balance of nature.

Physics:
Energy-its conservation, alternative sources of energy, biogas plants, solar power, windmills, noise pollution, harmful effects of radiation.

Geography : Forests, minerals, industrial pollution, desertification, river systems.

History : Hazards of wars and nuclear warfare.

Languages: Various aspects of EE can be taught in Language subjects.

While teaching environmental education, the following aspects should be borne in the mind -

- Environment should be considered in its totality – natural and manmade, social and technological.
- It should be a lifelong process, beginning with the school and continuing throughout life.
- It should be interdisciplinary, drawing on the contents of other subjects.
- The environmental issues should be examined from the local, national and regional and international points of view so as to enable the students to get the proper perspective and become familiar with the conditions and problems in other geographical areas.
- There should be focus on the current and potential environmental issues.
- Stress on the value of local, national and international cooperation in solving environmental problems.
- The learners should have a role in planning the learning process.
• The learners should be helped to discover the symptoms and real causes of environmental problems.

• Use diverse learning environments with stress on practical activities.

Environment, a global concept today, is not a subject if study but an approach to learning. It helps people in overcoming prejudices and programming learning experiences ranging from simple to complex. Environmental education makes the child’s education problem-based and makes it understand the environment and the dangers of pollution. The curriculum of environmental education is socially relevant as it educates the child on how unplanned and indiscriminate development endangers our own existence on this planet.

Environmental Education as Core Curriculum:

In the normal practice of curriculum planning, each subject is independent of the other subjects, with each subject having its own textbook and curriculum. This approach may be regarded as ‘atomistic’ as disciplines form discrete and separate parts. In this atomistic approach, however, some basic problems arise when Environmental Education is incorporated in the curriculum. The main problem is that introduction of Environmental Education results in less time for other subjects. This problem, of course, is to of other approaches too that are described above. Taking into consideration the problems of implementing Environmental Education in the school curriculum, Fensham and May (1979) suggested that Environmental Education should play the role of nucleus curriculum, as is being performed by science education at present. To develop the core curriculum, one may start with the characteristics of Environmental Education that form the basis of this core, taking guidelines from the Tbilisi Conference, the following characteristics emerge:

• Environmental Education is oriented towards a problem

• Environmental Education is concerned with realistic situations
- Environmental Education aims at elaborating the alternatives that exist for situations and skills of choosing between them
- Environmental Education includes action as an integral component
- Environmental Education uses real environment of the school and its surroundings as a context
- Environmental Education involves the clarification of values
- Environmental Education aims at increasing the ability that students have to contribute to improving their own environmental situations.

With the help of these characteristics we can identify how science and other subjects are contributing to Environmental Education.

The Approaches of Teaching Environmental Education may also be classified in terms of the varied emphasis in the curriculum, as follows:

- Emphasis on Skills
- Emphasis on Themes
- Emphasis on Environment as Medium of Learning
- Emphasis on Problem-Solving

Steps to be taken by the Curriculum Makers in Different Countries:

Environmental education plays a dual role, reproducing certain aspects of the current society and preparing students to transform society for the future. These roles may not be mutually exclusive. However, without the commitment to sustainable development, curricula have tended in the past to reproduce an unsustainable culture with intensified environment and development problems rather than to empower citizens to think and work towards their solution. The role of formal environmental education in building society is to help students to determine what is best to conserve in their cultural, economic and natural heritage and to nature values and strategies for
attaining sustainable development in their local communities while contributing at the same time to national and global goals.

Curriculum has to be reoriented to place the notion of citizenship among its primary objectives, in tune with the goals stated above. This would require a revision of many existing curricula and the development of objectives, content themes, teaching, learning and assessment processes that emphasize moral virtues, ethical motivation and ability to work with others to build a sustainable future.

Such an orientation would bring more attention to the humanities and social sciences in the curriculum. The natural sciences provide important abstract knowledge of the world, but do not contribute to the values and attitudes that must be the foundation of sustainable development. Increase study of ecology is not sufficient to reorient environmental education towards sustainable development. Studies of the biophysical and geophysical world are necessary to understand sustainable development. The traditional primacy of nature study, and the often apolitical contexts in which it is taught, need to be balanced with the study of social sciences and humanities. Learning about the interactions of ecological processes would then be associated with market forces, cultural values, equitable decision-making, government action and the environmental impacts of human activities in a holistic and interdependent manner.

The central goals of environmental education must include helping students learn how to identify elements of unsustainable development that concern and how to address them. They need to practice thinking, which helps them in finding alternative ways of achieving development and living, more sustainable consumption and production patterns, and learning how to negotiate and justify choices. These are the skills and abilities that underlie good citizenship, and make environmental education for sustainable development part of a process of building an informed, concerned and active populace.

To reorient the curriculum towards sustainable development, the following structural reforms in elementary education are necessary.
• There is a need to reexamine the centralized mandating of courses and textbooks in order to allow for locally relevant learning programmes. Local decision-making can be facilitated through the reform of centralized environmental educational policies and curricula, and the formulation of appropriate syllabi and assessment policies.

• There is a need to develop new ways of assessing the processes and outcomes of learning.

UNESCO's First Inter-Governmental Conference on Environmental Education, Tbilisi (Georgia) USSR, 1977

The participants of this conference included delegates from 66 Member States, observers from two non-Member States as well as representatives from 8 agencies and 20 international non-governmental organizations.

The Declaration adopted at this Conference stated that Environmental Education should constitute a comprehensive lifelong education. The other points made at this Conference were:

• Environmental Education should be provided for all ages, at all levels and in both formal and non-formal education.

• The mass media have a great responsibility in making their immense resource available for this educational mission.

• Environmental specialists should be involved in the course of the students training and should be given a full sense of their responsibilities in this respect.

• Environmental Education should not be just one more subject added to existing programmes but should be incorporated into programmes intended for all learners.

• A practical education-oriented approach should be adopted towards the solution of the problems of the environment or at least make the pupils better equipped for their solution by teaching them to participate in the decision-making process, in Environmental Education.

• Stress was laid on the importance of environmental training of professionals.
• Member-States should encourage and develop the organization of museums and exhibitions in order to increase public awareness of environmental issues and of environmental education itself.

Curricular objectives of EE :

In accordance with the Belgrade charter (1975) and Tbilisi Workshop (1977), the curricular objectives of environmental Education are:

A) To help individuals and social groups acquire an awareness of and sensitivity to the total environmental and its allied problems along with their implications to humanity.

B) 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.

C) 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.

D) To help individuals and social groups to acquire the skills for solving environmental problems.

E) To help individuals and social groups evaluate environmental measures and educational programme in terms of ecological, economic, political, social aesthetic and educational factors.

The goal of environmental action is to improve all ecological relationships, including the relationship of humanity with nature and people with other we have noted that since the early 1930's elements of what environmental education today have been assimilated into the school curriculum. Nature study with a view to develop an appreciation for the elements in nature is the first to come as a course of study. But not until the fifties did we find that components of ecology and ideas about conservation and an overgrown human population growth was evident in the school programmes in the sixties and the seventies. However, all these scattered ideas
about nature and natural resources and their conservation and an overgrown human population have only recently been linked together under the umbrella of environmental education where the boundary lines of many an academic discipline combine as the problems of the environment grow to an unprecedented dimension. Environmental education has been incorporated at various levels of education. At elementary stage it is in the form of Environmental Science. At primary level it is part of Science subject, at the secondary stage it is the part of all the subjects and at the higher secondary stage, it is part of the biology text book. Environmental Science prepares well informed and responsible citizens. It aims at developing an understanding of physical and social environment.

Environment has been defined as the sum total of all conditions and influences that affect the development and life of organism. (Ambasht 88). The conditions and influences can be biotic or abiotic that is living or non living.

All living beings are directly or indirectly dependent on nature. So, it becomes a pre-requisite that, we should be aware about the extent to which homeostasis of nature works. Beyond equilibrium, there are back lashes, which certainly are undesirable. Our main goal is sustainable development. For sustainable development, we will have to train our young minds in their early years through environmental science as the objective of environmental science is to acquire awareness and knowledge, to develop attitudes, skills and abilities to participate in solving real life environmental problems. Environmental Science is important for sustainable development, which means, whatever exists today on planet earth, should be used very judiciously in a prudent manner, so that whatever we have today, should also persist in future.

Environmental Science at the primary stage is a subject from class I to IV which lays a basic foundation for science and social environment. Whatever instances or incidences are taking place around us directly or indirectly. As a result, they influence child’s growth and development. So, pupil must know about the environment. Students should be able to observe
flora and fauna around them, should be able to recognize and protect them from being harmed or destroyed. They should be able to know about the importance of air, water and food as well as how to stop air, water and food from getting more polluted. They should be able to develop the habit of cleanliness. They should be able to see and observe the gradually expanding components of human life. They should be able to know about natural phenomena, national festivals and they should take pride for their nation.

With the above mentioned objectives, Environmental science is introduced from the primary level. Environmental Education has to be taught through the environment itself where environment is used as the material for teaching.

2.22 EE AT SECONDARY LEVEL:

At the present time environmental education is not viewed as a separate discipline but an integral part of the total school curriculum. It has been said that environmental education emerged as the outcome of a reorientation of the various disciplines and of different educational experiences. This enables the learners to achieve an integrated perception of the environment and to act towards it in a way that is more rational and attune to social realities, now and in the future.

National Consultations on Environmental Education in Schools:

The Department of Education in science and Mathematics of NCERT has undertaken a project (1993) to analyze the school curricula developed by the council as part of the implementation of national policy on Education (1986). The analysis was done to identify the EE concepts and activities vis-à-vis the universal objectives of EE (Awareness, Knowledge, Skills, Attitudes, Participation) as agreed at the Tbilisi Conference (1977). This exercise also helped in the identification of the strengths and weaknesses of NCERT curricula in terms of expectations of EE.
The Department of science and Mathematics, on behalf of the NCERT, also undertook a UNESCO sponsored case study on Environmental Education in India. This opportunity provided insight into the present status of EE Concepts and training at the school levels, higher education and technical education. This would help in strengthening EE components at the school level.

The recent development such as, launching at world conservation strategy (1984), report of the world commission on Environment and Development-Our Common Future- culminated into Agenda 21 agreed upon by 170 nations and adopted at the United Nations Conference on Environment and Development held at Rio, Brazil during June 1992. The concept of sustainable development has become an integral component of EE activities. In fact, EE is rechristened as Environmental and Development Education in Agenda 21.

Agenda 21 takes into account all areas/subjects with bearing on global environment. It also covers different areas which could be employed to promote environmentally sound development. Some of the subjects are poverty, consumption patterns, demographic dynamics, deforestation, desertification and so on (Annexure I).

Each section on the various subjects suggests analysis of the specific problem concerning each subject and also gives possibilities for procuring resources to initiate and sustain suitable action.

Chapter 36 of Agenda 21 (Annexure II) is titled promoting Education, public Awareness and Training. The three programme areas described are:

- Reorienting education towards sustainable development
- Increasing public awareness
- Promoting training

Education has been considered as “critical for promoting sustainable development and improving the capacity of the people to address environment and development issues. While basic education provides the underpinning for any environmental and development education, the latter needs to be incorporated as an essential part of learning”.

In order to supplement the analysis of individual and institutional consultations it was decided to organise two face to face National Consultations on Environmental Education in Schools. The First Consultation on the academic aspects of Environmental Education (EE) in Schools was organised by NCERT on 13-14 February, 2004 in New Delhi. Seventy participants comprising eminent scientists, environmentalists, officials of central and state govt. departments dealing with environment, senior academicians attached to Departments/Centers of environmental studies, environmental science, environmental ecology, botany, regional development, geography, marine biology etc. of different universities, teacher educators, principals of teacher training colleges, prominent Non-Governmental Organisations (NGOs) and NCERT faculty took part in deliberations. The Second Consultation on the Implementation of EE in Schools was held on 13th March, 2004. Seventy-two officials comprising Presidents/Chairpersons of Boards/Councils of School Education, Directors of State Councils of Educational Research and Training (SCERTs), Directors of Education in the states, eminent scientists, environmentalists and NCERT faculty participated. 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. Various issues were deliberated upon in these Consultations through plenary presentation, open house discussion, interaction in groups and consolidation of recommendations.

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. In the detailed discussion that followed it was noted that National Curriculum Framework for School Education (NCERT, 2000) has already made recommendations of far reaching consequences with regard to EE for different stages of school education. Significant initiatives undertaken by the state level agencies in revising their curriculum and syllabus including EE over the years were also highlighted.

Wide ranging suggestions received through consultations include identifying the mission and objectives of EE, initiating proactive action and reforms in
curriculum and syllabus, pedagogy and classroom transaction, evaluation, teacher education and implementation strategies.

The viewpoints that emerged from interaction on various issues are highlighted below:

**Mission:**
The implementation of EE in schools needs to be undertaken in a mission mode. The mission could be stated as:

To prepare young minds to appreciate the importance of environment in a holistic manner, not only for human survival but for all life forms on Earth, to inculcate a positive attitude towards environment, and to encourage pro-active action for a sustainable future.

**Objectives:**
The overall objectives of EE are to develop in the learner:

- an awareness of the environment and its problems;
- basic knowledge and understanding of the environment and its inter-relationship with man including indigenous tradition and cultural practices related to the environment;
- habits, values, attitudes and emotions to maintain and promote 'quality environment' for human survival;
- skills to solve environmental problems;
- ability to assess the outcomes of environmental action and initiatives; and
- a sense of responsibility and urgency to ensure appropriate action to solve environmental problems.

EE, therefore, aims at cognitive, affective and conative behaviour modification. This is an action-oriented, project-centred and participatory process leading to development of self-confidence, positive attitudes and personal commitment to environmental protection and its improvement. Furthermore, the process needs to be implemented through an interdisciplinary approach.

The concept of 'man-nature interdependence' highlights the dynamic nature of the relationship between human beings and environment. This should be the cornerstone of bringing about an understanding of environment leading to action for sustainable development.
Curriculum and Syllabus:
EE should be a compulsory subject in the school curriculum. Accordingly, the syllabus at different levels of school education needs to be suitably reviewed in order to identify linkages and to avoid overlapping of contents.

Though the school syllabi caters to all the three domains of learning, viz. cognitive, affective and conative, during transaction due to various reasons only cognitive aspects are generally focussed on. There is a need to design projects and activities to activise affective ar.d conative domains of learning.

Pedagogy and Transaction:
Pedagogy will have to be based on local contextuality, the indigenous social perception of environment, cultural tradition, multi-disciplinary approaches and experiential learning strategies. Pedagogy has to come out of the confines of the school and extend itself to the active participation of parents, family and the entire community.

In Classes I-II, the entire transaction needs to be woven around the child's immediate environment, and it must also be built upon the child's inherent curiosity, observation and the ability to co-relate at that age.

At the higher levels, greater attention has to be given to additional practical inputs in the form of investigations, project work, co-scholastic activities and the like. There is a need to create separate time slot and space within the total Curricular frame-work for which details in the form of projects/activities to be undertaken by students and their gradation can be worked out. This experience could be evaluated both qualitatively and quantitatively through appropriate weightage assigned to each of these inputs.

EE is not teaching-learning transaction alone. It has to become a way of life of all the stakeholders in the school, as also the community. Therefore, the process needs to permeate the school system and be reflected both in the physical environment of the school (eg: water and sanitation facilities, garbage management, green school campuses, energy conservation, etc.) and the attitudes and actions of all those who are part of the school education system — teachers, parents, administrative staff and the management.

Field activities like camping and trekking provide opportunity for students to experience nature first-hand, develop life skills and encourage their
spirit of adventure. Nature camps have proved to be an effective way of introducing children to the wonders of nature, awakening their concern for it and laying the foundations of a conservation ethics. Through the exercise of their sensory faculties, students learn the art of self-discovery. Leadership skill building and community living are important benefits that a student derives from such experiences.

Creatively planned use of facilities like botanical gardens, agricultural, fields, ponds, factories, museums, natural history museums, cultural heritage sites and planetaria can help to create an interest in environment and reinforce curricular learning. Opportunities for such visits must be actively explored and used by schools at all levels.

The transaction modalities of EE would include interactive mode, demonstration, discovery approach, project based methods, action oriented practicals, field visits, value clarification and community based approaches.

**Evaluation:**

Evaluation has to focus on cognitive, affective and conative learning in a balanced manner.

EE as a compulsory subject needs to be assessed through continuous evaluation, group evaluation, peer evaluation, institution based evaluation and external evaluation through appropriate grades.

**Implementation Strategy:**

EE offers an opportunity for community involvement. Investigative projects and action oriented problem-solving projects suited to age and ability of the learner need to be undertaken in partnership with the community. School - community mutuality needs to be established and strengthened through various modes. Parent-teacher associations could also play a major role in actualising the objectives of EE.

Institutions like DIETs, CTEs, SCERTs, IASEs, University Education Depts. and other Teacher Education Institutions, have to function as resource centers on EE. State and national level institutions would assist them in their professional activities.

For effective implementation of EE, the role of media is also important. Networking with different media agencies, organisations and institutions has to be established.
Appropriate training, orientation and awareness generation programmes for teachers, teacher educators, parents and educational administrators need to be undertaken simultaneously.

Formulation of implementation strategies, logistics and support system for introduction of EE as a compulsory subject in the school system, needs to be initiated at state and district levels.

Effective implementation of EE would require development of a comprehensive support system both within the school and outside the school system. This would include professional preparation of teachers, head masters and other functionaries; involvement of community, NGOs, electronic media and institutions/organisations dealing with areas and elements of environment.

The success of implementation of EE would depend on delineation of the roles and responsibilities of Directorates of School Education, the State Boards/Councils of School Education, SCERTs/SIEs, DIETs, CTEs, IASEs, University Education Departments and other Teacher Education Institutions in curriculum/syllabus planning, evaluation, monitoring and networking at the state level.

**Recommendations:**

1. EE as a compulsory subject needs to focus in a graded manner on all the three domains of learning i.e., cognitive, affective and conative.
2. In Classes I _ II, the curriculum for EE automatically becomes a part and parcel of language, mathematics and the Art of Healthy and Productive Living.
3. The existing syllabus of EE in Standards III to V needs to be reviewed for bringing in greater emphasis on students carrying out activities in their local environment and development of habits and values.
4. Teachers are required to be empowered and committed to function as curriculum constructors with confidence, appropriate resources and training support pre-dominantly at the primary level.
5. The content of EE in the syllabi of upper primary stage will have to be suitably reviewed with a focus on affective and conative components by providing additional inputs in the form of investigation, project work, co-scholastic activities and the like.
6. At the secondary stage, the focus of EE as a compulsory subject should not mainly be on knowledge and information processing but on acquisition of skills, development of attitudes and values and participation in actions through activities, projects, field interactions and co-curricular activities.

7. At the higher secondary stage, one full paper of EE for one of the semesters each year as part of the foundation course has to be made compulsory for both academic and vocational streams. At this stage, the focus needs to be on development of critical thinking ability, problem solving skills and participation in pro-active action in community settings.

8. Introduction of EE as a compulsory subject would require reformulation of curricula in other subject areas as well, in order to avoid duplication or replication and increase in curriculum load.

9. The school environment should be both a demonstration and a manifestation of the EE process.

10. Every child from the upper primary level onwards has to be provided with the opportunity to participate in at least one nature/outdoor field visit experience.

11. The content and transaction of EE needs to recognise, acknowledge, respect and celebrate all forms of diversity and local contextuality.

12. The content related to environmental issues and concerns needs to cover the range from the local to the global in a graded manner.

13. The pedagogy of EE will have to be based on local contextuality, indigenous knowledge, experiential learning strategies, multi-disciplinary approaches, project based methods and action oriented practicals.

14. EE has to be the concern of all teachers in all subject areas. Every teacher would have the capacity to design teaching-learning strategies in EE.

15. Regular and periodic renewal and updating of syllabus of EE is desirable.

16. Environmental values have to be suitably integrated with the curriculum, teaching-learning process and teacher education.
17. At the primary stage no formal evaluation is recommended. At the secondary and senior secondary level EE as a compulsory subject could be evaluated both internally and externally by awarding grades. Evaluation of affective and conative domains may be undertaken through group evaluation, peer evaluation, self-evaluation, institution based evaluation and periodic achievement surveys for impact study.

18. The syllabi for both the pre-service and in-service teacher education programmes require significant modification and changes. NCERT may prepare curriculum with EE component for teacher education courses.

19. Specific strategies will have to be designed for in-service education of teachers on the new approaches of EE.

20. Teacher education programmes of two years duration for secondary and higher secondary teachers, as recommended by the National Council for Teacher Education, need to be considered for imparting all the requisite competencies, skills, values and attitudinal changes in the learner.

21. Collaboration has to be established between NCERT, Indian Space Research Organisation (ISRO) and State Institutes of Educational Technology (SIETs) for teacher preparation through distance mode and production of multi-media materials.

22. Community involvement, particularly that of youth power, is crucial in the process of teaching-learning of EE. School - community mutuality needs to be established and strengthened through various modes. Parent-teacher associations could also play a major role in actualising the objectives of EE.

23. NCERT may develop a master plan for development of materials, training of key persons and master trainers in collaboration with national level and state level agencies/departments.

24. Teacher education institutions at different levels need to function as resource centres for EE in states and districts.

25. National electronic media like Doordarshan and Akashvani need to provide slots during prime time for generating awareness and building a climate for action to find solutions to environmental issues.

26. States will have to develop their own monitoring and networking mechanisms for implementation of EE.
Role of Environment Education Teacher:

Though Environmental Education is a relatively recent concept, it has been in vogue in our country since the ancient times. The Tiwari Committee in its report, in 1980, stressed the need for Environmental Education, in our country.

Teachers have a dominant role to play in environment education. Qualified teachers are required to meet the need of imparting truly ecological ways of thinking in specialized areas and while dealing with many complex relationships. Teachers have to develop a high level of specialized knowledge and pedagogical skill to impart information regarding new facts, relationship, threats and conflicts in the environment.

Teachers play a crucial role in forming, changing and establishing attitudes and values that are important for environmentally responsible behaviour. That is more important than their teaching is the nature of the lifestyle that they lead. Without a good teacher, the best curriculum and the best environmental didactics can remain without effect for each of the appropriate ecological example.

Teachers should take a leading role in pursuing the actions on environmental education, whether acting as individuals infusing environmental perspectives into their classes or collectively fostering environmental education through their educational institutions, professional societies, state infrastructure and local or national advocacy groups.

The role of an Environmental Education Teacher includes the following:

- **Planner:** Any effective teacher undertakes a lot of planning. The teacher of environmental education is no exception. He should prepare Lesson Plans and Annual Plans relating to environmental education.

- **Organizer:** any plan will meet with success only when it is implemented effectively. For this, the teacher of environmental education should tailor
his teaching according to the learning abilities of the students, and use the resources that are locally available, including the resource persons, to achieve his objectives.

- **Guide:** The role of a good teacher does not end with teaching alone. He should be a friend, philosopher and guide for the students. He should realize the needs, aptitudes and interests of the students and motivate them to take an active part in the environmental protection activities.

- **Explorer:** Environmental education is more an outdoor activity, while the theoretical part may be taught in the classroom, the students can get an actual feel of the subject only when they undertake some exploratory activities to understand the environment. For this, the teacher himself should be inclined towards exploratory methods of learning. To achieve this, the teacher can assign some projects to the students and make them feel the reality of environmental education.

- **Recorder:** The teacher should realize that environmental education is best imparted through experimental learning. For this he should undertake investigation, record the data and analyze the recorded date. By recording, the changes in the environment, he can impress upon the students the changes that take place in the environment.

- **Coordinator:** The role of a teacher of environment education is not confined to the classroom alone. As this is a subject that can be taught effectively in the actual surroundings rather than in the classroom, he should be able to bring together the different entities and resources concerned to achieve the objectives of environmental education.

- **Teachers Associations** can play a central role in the evolution of environment education. In the US specialized professional and research organizations like National Council for Geographic Education have established committees or taskforces that focus on sustainable development and the environment. In India, these efforts are led by NCERT at the Centre and its counterparts SCERTs at the State level.
For all these activities, teachers can seek assistance from institutions of higher education, professional organizations and State and Central departments.

**Responsibilities of Environmental Education Teachers:**

The Environmental Education Teachers have a formidable responsibility of ensuring that their educational offerings on environment, especially sustainable development, consistently meet the highest standards and serve students, parents and the community.

- He should correlate the topics of environmental issues while teaching his own subject matter.

- He should help individuals in providing awareness of and sensitivity to the total environment and its allied problems.

- He should create an awareness regarding renewable and non-renewable resources of environment.

- He should help his pupils to acquire basic understanding of the total environment, its associated problems and humanity's critically responsible presence and role in it.

- He should make the students understand the ecological balance by using play-way techniques.

- He should help his students to acquire social values, concern, and the necessary motivation for the active participation in the protection of environment.

- He should organize plays and other related activities on environmental conservation.

- He should assist individuals to acquire environmental problem-solving skills.
• He should initiate efforts and organize trips to zoos, national parks, polluted areas, polluted lakes and rivers etc.

• He should assist the pupils in evaluating environmental measures and education programmes in terms of ecological, social and aesthetic factors.

• He should take an active part in organizing seminars and workshops on environmental issues like global warming, ozone depletion, pollution etc.

• He should promote among students a sense of responsibility and immediacy regarding environmental problems to facilitate appropriate action to solve these problems.

• He should organize lectures on topics of environmental problems.

• He should teach the interdependence of living things as the relationship between the needs of society and the interaction with environment.

• He should discuss environmental issue along with simple teaching activities to drive home the significance of environmental resources.

• As individuals, teachers are responsible for pursuing opportunities for professional training to incorporate the principles of sustainable development in their courses.

• They can take the support of the non-governmental organizations too to ensure that their efforts embody diverse cultural perspectives.

• They can attempt some innovations to bring the corporate sector and the people in general into the educational experience.

• They can participate in workshops and seminars that help in finding appropriate uses for advanced information and communication technologies for teaching concepts like sustainable development.

• They can initiate or replicate successful attempts to make the classroom serve as a model of sustainability for the community.
• Professionals in higher education can play one of the most decisive roles through innovative programmes by finding ways to integrate interdisciplinary and systems approach in their undergraduate and graduate courses.

• Teachers in higher educational institutions should train a new generation of teachers who will be more effective at inspiring creative thinking and sound decision-making among their students.

• Through university-level research, the teachers of Environmental Education should break down the barriers between various disciplines and enliven their own teaching.

• They should search for every opportunity to engage their colleagues from other disciplines in their research and teaching activities.

**Competencies of Environmental Education Teachers:**

Teachers of environmental education should be familiar with the following teaching methods and be able to put them into action.

• Hands-on observation and discovery in the environment.

• Inquiry.

• Cooperative learning.

• Community-based action research and problem-solving.

• Investigating environmental issues.

• Simulation and models.

• Case studies.

• Problem-based learning.

• Project-based learning.
Teachers of environmental education should have a basic understanding of the theory, practice and history of environmental education. This knowledge provides a solid foundation on which the teachers can strengthen their teaching in the following aspects:

- Fundamental characteristics and goals of environmental education
- How environmental education is implemented
- The evolution of environmental education

Environmental education teachers should understand that environmental education takes place in a variety of settings and sources of support, with programme requirements and other factors varying from context to context. For this, the teacher should identify the individuals, organizations and agencies delivering environmental education programmes. A competent teacher of environmental education realizes that environmental education requires moving beyond the traditional methods of classroom teaching through the use of traditional disciplinary skills.

2.24 THE PRESENT STATUS OF THE SECONDARY CURRICULUM ON ENVIRONMENTAL EDUCATION IN ANDHRA PRADESH:

Text books of all the secondary school subjects were published by the Govt. of Andhra Pradesh in Telugu, Hindi and English media. The existing text books of various secondary school subjects were first published in between the years 1992 and 1998. The same text books are being reprinted every year by the Govt. as per requirements. Some lessons / part of the lessons were added / deleted in non-language subjects during the years 2002, 2003 and continuing the same content in the subsequent reprints up to 2008.

Environmental education- activity books titled “Manaprpancham”(our world) were developed for students of classes 1 to 10th by SCERT, Andhra Pradesh and published by Andhra Pradesh National Green Corps Society, Hyderabad.
in Oct. 2005. These books were supplied in bundles to all the recognized schools in the state at free of cost.

Content:

In text books of 8th class: Environmental education topics integrated in Telugu (4 lessons), Hindi (1), English (4 in EM & 7 in TM) and infused in Physical sciences (3 lessons), Biological science (2) and Social studies (2).

In text books of 9th class: Environmental education topics integrated in Telugu (2 lessons), Hindi (3), English (2 in EM & 5 in TM) and infused in Biological science (4 lessons) and Social studies (1).

In text books of 10th class: Environmental education topics integrated in Telugu (2 lessons), Hindi (5), English (7 in EM & 5 in TM), infused in Social studies (3 lessons) and in Biological science (1 lesson).

The components of the curriculum in environmental education- activity books titled “Manaprapancham” (our world) were developed as per directives of NCERT. These books failed to draw the attention of schools’ management, teachers, parents and students as they are non-examination books. Thus the main motto behind the publication of these books were overshadowed by the system of examinations.

Teaching-learning strategies:

Teaching-learning strategies are passive, dull and boring and the content being taught in the examination point of view to get more passes with highest scorings.

As per the orders of director of school education, all the recognized schools allotted two periods per week in the time tables of secondary classes to teach environmental education from the year 2006.

Exemplar activities are being neglected and if at all, restricted to classroom only.

Learning outcomes and Evaluation of the outcomes are being neglected completely by the teachers and students.

Enrichment material:

Environmental education- activity books titled “Manaprapancham” (our world) were developed for the classes 1 to 10th by SCERT, Andhra Pradesh and published by Andhra Pradesh National Green Corps Society, Hyderabad.
in Oct. 2005 and supplied to all the recognized schools in the state at free of cost.
Teacher’s manual on environmental education in Singareni schools was developed by WWF-AP and APNGC and published by the Singareni collieries management which was supplied to its teachers of all educational institutions at free of cost. Nature clubs are good resources to create environmental awareness among the students. APNGC advised the trained EE teachers to form Nature clubs in their respective schools and extending financial support to some extent for their well maintenance. All the Singareni Schools got established “Eco-clubs” under different names of environmental importance with students’ active participation under trained teachers’ guidance.

Teacher education and training:
SCERT, A.P. has been conducting state wide work-shops, training and refresher courses on EE to teachers of the different subjects periodically. Govt. of A.P. offered district wise training to very few selected teachers from each school with training support from A.P.N.G.C. Society, Hyderabad. Singareni Collieries Educational Society under the management of Singareni Collieries Company (a government company) offered training to 90 teachers from different subject backgrounds of its educational institutions spread in 4 districts.

A series of workshops & refresher-training courses for school teachers on EE are being conducted periodically from July 2003 to today. Teacher’s manual on environmental education in Singareni schools was developed by the management and supplied to its teachers of all educational institutions at free of cost. Conducting of work shops, training of teachers, refresher- courses and development of EE material for both teachers and students were supported by WWF-India, A.P. state office, Hyderabad and NGC, Hyderabad.

WWF designed training compendia for SCES teachers with the titles “Techniques for environmental education” and “Hand book on environmental education for teachers”.

2.25 EE-PROBLEMS OF IMPLEMENTATION:

Environmental Education— Problems of implementation:

Institutions offering environmental education require access to timely and credible information on the state of environment, extent of the problem, its impact on the human beings, and ways to resolve problems. In India, data and information are very often collected and managed by different agencies and there is lack of coordination and communication among these agencies in the sharing of information.

The development of environmental education in India has concentrated on the primary and secondary levels of the formal education system, with less attention paid to the tertiary and preschool levels. Too much emphasis has been placed on theoretical cognitive aspects, while affective components like values, attitudes etc. and techniques are still not given any attention. Many schools lack adequate infrastructure facilities, as well as adequately trained teachers and materials. The overcrowded school curriculum prevents schools from incorporating more field-based investigative type studies on the environment.

Some of the major problems facing Environmental Education in the country can be described as follows:

Resource Constraints: Lack of resources is one of the major problems that is being encountered in the promotion of Environmental Education in the country. This is true of other developing countries too. It is a fact that any Environmental Education programme require adequate resources, both in terms of money and personnel, if it is to be implemented successfully.

High Pupil-Teacher Ratio: As in many other developing countries, in our country too the student-teacher ratio is very high making it difficult for the teacher to adopt investigative and experimentation approach.
High Dropout Rate: Because of the high dropout rate in our education system, the teachers are left with no option but to begin the Environmental Education component from the primary classes to ensure that the students, even if they drop out later, are sensitized to the environmental problems.

Social Constraints: Sometimes the conclusions drawn from the study of Environmental Education may clash with the prevailing social, religious and political thinking. This clash in thinking may lead to undesirable confrontation too. Environmental 'education has no meaning and purpose if it is not accompanied by action. Ensuring this action is not easy.

Difficulty in Assessment: Assessment of the work done as part of Environmental Education is difficult as many a time it is difficult to think of a common yardstick to evaluate the work done under different projects.

Formal environmental education faces the following difficulties:

- A shortage of trained education officers in environmental education in the government to plan, organize, implement and monitor environmental education programmes in schools.

- A shortage of supporting staff and office equipment at the National Environmental Education Centres.

- Shortage of environmental education material for teachers and students.

- Weak monitoring system.

- Lack of good communication networks, cooperation and coordination within and among the various governmental and non-governmental organizations.

- Lack of government priorities or political will for environmental policy.

- Lack of recognition of communication as a valuable tool for policy, in part because of a misconception about communication as pertaining only to
media, rather than as a relation with different parts of the policy cycle, and also because of competing demands for financial resources.

- Lack of appropriate legislative framework, enforcement and institutional support.
- Limited resources like funds and suitable materials to address the environment and environmental education.
- Government control of mass media.
- Lack of commitment and involvement on the part of the people concerned.
- High turnover of staff in schools and government.
- Lack of focus on schools and emphasis on formal education.
- Excessive curriculum and lack of teacher training and resources.

2.27 EE-RATIONALE:

“Today’s child is tomorrow’s citizen”. We have had huge technological changes and we have also introduced computers in school education. But without a healthy environment how long will we be able to stay healthy? Is it possible to stay healthy in an unhealthy environment? A clean environment is a responsibility of all the citizens. Keeping this in mind it was decided that environmental science will be a subject at lower primary level. At upper primary level it will be a part of science. At secondary level it will be integrated with all other school subjects. Whereas at higher secondary level it will be a part of Biology syllabus.

In this chapter, we discussed all the components of EE which play a vital role at Secondary school level with Right Curriculum at Right Time by Right Persons and the present status of Secondary Curriculum on EE in A.P. State.