CHAPTER-I
INTRODUCTION

1.1 INTRODUCTION

Education is the most important invention of mankind. It plays a vital role in the development of individual as well as social uplift. National development and its productivity are very much related to the quality of education. Education enables citizens realize their rights and responsibilities. Education is as basic to civilization, and social survival, as reproduction and nutrition are essential to biological evolution. Education of man does not begin in at school, it begins at birth. It ends not when he graduates from the universities but at his death. Hence education is life long process. Education helps the person to overcome several obstacles to lead his daily life, with satisfaction. Education prepares a person to fit to the environment by giving strength of adjustment issues.

According to Education Commission 1964-1966 Dr. D. S. Kothari states his report with the statement that “The density of India is now being shaped in her class room”. It is true because the magnitude of any nation depends upon its students as the students are the pillars of the nation. No child is born with skill that enables him to function in his particular roll. Thus, school plays an important role in all round development of the child.

Education is a fundamental means to bring any desired change in society. This can be attained only if schools become real centers of learning. Education not only helps in the development of personality of the child but also determines his future.

“Education is the most powerful weapon which you can use to change the world”.-Nelson Mandela

“Education is not preparation for life; education is life itself.” -John Dewey

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

There is a Chinese proverb, “If you plan for one year, plant rice, if you plan for ten years, plant trees and if you plan for 100 years, educate people.” If we want to protect and manage our planet earth on sustainable basis, we have no other option, but to make all persons environmentally educated.

1.2 CONCEPT OF ENVIRONMENTAL EDUCATION

The concept of Environmental Education was first formalized by the International Union for the Conservation of Nature and Natural Resources (IUCN), in 1970 at a meeting in Nevada, USA. At that meeting, Environmental Education was defined as a process of recognising values and classifying concepts in order to develop skills and attitudes necessary to understand and appreciate the interrelatedness among man, his culture and his biophysical surroundings. Environmental Education also entails practice in decision-making and self-formulating of a code of behavior about issues concerning environmental quality.

Environmental Education is a necessary tool for making appropriate decisions concerning the solution and prevention of environmental problems. 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 manmade surroundings which includes
the relation with his population, pollution, resource allocation, transportation, technology and urban and rural planning to the total human environment. Environmental Education must utilize diverse learning environment and a broad array of educational approaches to teaching learning about and from the environment with due stress on practical activities and first hand experiences. It should help learners to discover the symptoms and real causes of environmental problems and this to help 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, should be interdisciplinary discipline and make possible a holistic and balanced perspective. Environmental Education has the target population that includes students, teachers, doctors, engineers and common man. The Environmental Education include opportunities to acquire the knowledge, values, skills, attitudes, commitment and improve the environment and to create new patterns of behavior of individual group and society as a whole towards society. Therefore, it requires that appropriate action takes place in the behavior to protect and improve the environment. Environmental Education programme includes development of correct values and attitudes towards environment.

In 1969, Dr. William Stapp at the University of Michigan published the first definition of Environmental Education. Environmental Education is aimed at producing a citizenry that is knowledgeable concerning the biophysical environment and its associated problems, aware of how to help solve these problems and motivated to work toward their solution. (Stapp et al., 1969)

The American states conference on Education and Environment in America 1971, defined Environmental Education as follows: “Environmental Education involves teaching about value judgments and the ability to think clearly about complete problems about the environment which are as political, economical and philosophical as they are technical”. (Krishnamacharyulu and Reddy, 2005)

At an International conference of UNSESCO held at Tbilisi in 1977 defined Environmental Education as an integral part of the education process. It should be centered on practical problems and be of an inter-disciplinary character. It should
aim at building up a sense of value, contributing to public well being and concern itself with the survival of the human species. Its force should reside mainly in the initiative of the learners and their involvement in action and it should be guided by both immediate and future subjects of concern.

NCERT (2000) has recommended Environmental Education as a separate discipline at elementary level on 21st January 2003, the United Nations Environment programme launched state of the environment reports for south Asia, one targeting policy makers and the other written by youth. The south Asia state of the environment report identifies five key environmental issues. Livelihood security, environmental disasters, industrialization, urbanization and biodiversity loss. The major recommendation of the international conferences on Eco-Restoration held at Dehradun and New Delhi was to express great concern at the rapid degradation of both terrestrial and aquatic ecosystems throughout the world that has caused loss of biodiversity and various goods and service of the natural ecosystems and therefore, to incorporate tools of environmental evaluation and to ensure community participation.

1.3 NEED AND IMPORTANCE OF ENVIRONMENTAL EDUCATION

The need of environmental education is to educate the people of all ages on environment for making decisions which are compatible to environment. Environmental Education is a necessary tool for making appropriate decisions concerning the solution and prevention of environmental problems.

People need to learn ways to perceive environmental problems and opportunities acquire information for forming and evaluating alternative solutions and develop the cultural skills for living according to chosen alternatives.

The need for environmental education has also been formally acknowledged at both the national and international levels. Environmental consciousness should be developed teaching in schools and colleges. This aspect will be integrated in the entire educational process.

Environmental Education promotes attitudes of concern for the quality of the biophysical environmental, which will motivate citizens to participate in solving
biophysical environment problems. Environmental education and research are necessary because many environmental problems that cannot be solved by Government alone can be solved by individual, and the individuals must be educated to know what needs to be done. With enormous ignorance of vital environmental problems it is disheartening to realize that in many countries including India, lot of time and money are being spent on environmental destructive activities than constructive ones.

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

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

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

Environmental Education is required to promote among citizens of all the countries in the world, the awareness and understanding of their environment, their relationship to it, and the concern and the responsible action necessary to assure their survival and to improve the quality of human life on earth. More than anything else, Environmental Education seeks to develop, from the individual to the population level and for every cultural, geographical, age and intellectual group, an awareness of the complex, dynamic interrelationship between man and his total environment and the need for sustainable development.

1.4 GOALS OF ENVIRONMENTAL EDUCATION

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

i. To improve the quality of environment.

ii. To create an awareness among the people on environmental problems and conservation.

iii. To create an atmosphere so that people participate in decision making and develop the capabilities to evaluate the developmental programmes.

1.5 AIMS AND OBJECTIVES OF ENVIRONMENTAL EDUCATION

Generally, the aims of Environmental Education fall into three groups:

i. Cognitive aims: These include imparting 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.

ii. Normative aims: These relate to the inculcation of ecological awareness which will be conductive to the creation of modification of value models
enabling the individual and the group of identifying the factors that upset the environment equilibrium and protest against them.

iii. **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.

1.5.1 **Objectives of Environmental Education**

Environmental Education is not just classroom learning but about all learning activities intended to inform people about the environment and its management. This involves specific actions to improve environmental quality. It can develop a sense of responsibility and empower people to feel that they can make a difference by being actively involved in measures to improve environmental outcomes.

i. **Awareness**- To create an overall understanding of the impacts and effects of behavior and lifestyles on the local and global environments. The underlying assumption to the above approach is that Environmental Education must not only increase knowledge about the environment but it should also help to develop environmentally responsible attitudes and values, a commitment to work for change and a wide range of skills for resource management and environmental issues. The need for collaborative planning and shared decision making with the community is essential for achieving these.

ii. **Knowledge**- To help individuals, groups and societies gain a variety of experiences in, and a basic understanding of the knowledge and action competencies required for sustainable development.

iii. **Attitude**- Environmental Education helps individuals and social groups to acquire social values, strong feelings of concern for the environment and the motivation for actively participating in its protection and improvement.

iv. **Skills**- To help individuals, groups and societies acquire the action competence or skills of environmental citizenship in order to be able to identify and anticipate environmental problems and work with others to resolve, minimize and prevent them.
v. **Evaluation ability**- Environmental Education helps individuals and social groups to evaluate environmental measures and education programs in terms of ecological, political, social, aesthetic and educational factors.

vi. **Participation**- To provide individuals, groups and societies with opportunities to be actively involved in exercising their skills of environmental citizenship and be actively involved at all levels in working towards sustainable development.

Therefore, the objectives of the Environmental Reduction are to generate awareness, knowledge, attitude, skills, evaluation ability and participation to help social groups and individuals.

**1.6 GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION**

Environmental Education must involve everyone, because of its nature and importance. Environmental Education cannot be confined to any one group in our society. It is a responsibility for everyone-Government, industry, the media, the educational institutions, community groups—as well as individuals.

Environmental Education must continue all through the life. Information about environmental problems is always improving, as we learn from our past experiences and mistakes and as we develop and apply better environmental technologies, the knowledge must be transferred immediately.

Environmental Education must be holistic and interrelated with other subjects. We need to think broadly and understand systems, connections, patterns and causes. The challenges are social, scientific, cultural, economic and ethical aspects, all of which must be considered for their effective management.

There must better communicative links between those people working and learning on environmental issues and between various groups dealing with environmental issues.

Environmental Education must be practical. One of the most fundamental defining characteristics of effective Environmental Education is that it must lead to actions which result in better environmental outcomes and nor simply the accumulation of inert knowledge or impractical skills.
Environmental Education must be in harmony with social and economic goals and accord equal priority.

Effective Environmental Education must also encourage the pursuit of environmental goals in a way that acknowledges other powerful and legitimate social and economic goals. It should not be taught in a vacuum, or simply equip people to pursue an agenda on the margins of society.

Environmental Education needs to incorporate this reality by providing people with the knowledge, understanding and capacity to influence mainstream society in a way which progresses environmental objectives along with other legitimate social and economic objectives.

1.7 PRESENT STATUS OF ENVIRONMENTAL EDUCATION

Environmental Education has been a gift of International conventions, education policies and judicial activism. It has not come out as a result of the recognized internal need of the system. It has been internalized either by the curriculum planning agencies or implementing educational institutions through institutional mechanisms. Without special effect for internalization, it has turned out to be an un-welcome insistence with meager resource allocation and budgetary commitments. The school system comes out with a core curriculum taking into consideration the needs of the society at particular time. This gets revised from time to time, but incrementally. Basing on the required skills, the higher education system provides trained teachers who could be employed in the schools to transact this curriculum. Though the teachers have a specialized professional orientation, they are expected to transact certain core subjects which are multi disciplinary in nature. The syllabus gets integrated into languages, social studies, general science and mathematics. Any addition into this realm requires a special concerted effort with clear financial and institutional infrastructure.

1.8 ENVIRONMENTAL EDUCATION (EE) CURRICULUM AT DIFFERENT LEVELS OF SCHOOL EDUCATION

The National Policy on Education-1986 (renewed in 1992 p.36) stated “There is a paramount need to create a consciousness of the environment. It must
Environmental consciousness should inform teaching in schools and colleges. This aspect will be integrated in the entire educational process” Accordingly, the National Curriculum should highlight the measures for protection and care of the environment, prevention of pollution and conservation of energy.

The United Nations Education Scientific and Cultural Organization (UNESCO) and United Nations Environment Program (UNEP) created three major declarations that have guided the course of Environmental Education. At the elementary school level, Environmental Education can take the form of science enrichment curriculum, natural history fieldtrips, community service projects, and participation in outdoor science schools. Environmental Education policies assist schools and organizations in developing and improving Environmental Education programmes that provide citizens with an in depth understanding of the environment. These activities and lessons help address and mitigate “nature deficit disorder,” as well as encourage healthier lifestyles.

Environmental Education has been introduced in school curriculum at pre-school level, elementary level and higher secondary level both in State Board Schools and in Central (CBSE) Schools. Both the State Board Syllabus and the CBSE syllabus are prepared in accordance with the National Policy on Education (1986).

1.8.1 Environmental Education Curriculum at Primary level

At this stage it is important to build environmental awareness giving real life situations. The child is sensitized to his immediate surroundings where he is taught to keep his surroundings clean. He is thought the art of healthy living. At elementary level, the focus is stressed towards the environmental cleanliness. The role of environment is brought out through story telling and singing songs. For classes III to V Environmental Education exists as a separate subject under the name of environmental studies. The syllabus presents the same content laying greater focus on the participation of learners in activities so as to develop skills, proper habits and positive attitudes.
The contents and concepts covered are as follows.

- Familiarization with one’s own body.
- Awareness about immediate surroundings.
- Need for food, water, air, shelter, clothing and recreation.
- Importance of trees and plants.
- Familiarization with local birds, animals and other objects.
- Interdependence of living and non-living things.
- Importance of cleanliness and sanitation.
- Importance of celebration of festivals and national days.
- Awareness of sunlight rain and wind.
- Caring for pet animals.
- Awareness about air, water, soil, and noise pollution.
- Need for the protection of environment.
- Knowledge about the source of energy.

1.8.2 Environmental Education Curriculum at Upper Primary level

The major concepts deals at upper primary level are

- Adaptation of living beings in environment
- Natural resources
- Water cycle
- Food chain
- Importance of plants and trees in keeping the environment clean
- Classification of plants
- Role of plants and animals in environmental balance and soil conservation
- Ecosystem
• Necessity of clean air for healthy living
• Effects of environmental pollution
• Dependence of the community on the environment
• Necessity of wildlife protection
• Impact of deforestation
• Impact of Industrialization on environment

Co-scholastic activates includes organization of plays cultural programs, debates, mock parliament, discussions and community activities may help further in achieving the objective.

1.8.3 Environmental Education Curriculum at Secondary level

The environmental concepts both are at concrete and abstract levels. The Environmental Education contents included in science and technology and social science are largely retained with some realignment and readjustment. Concepts of conservation and sustainable development are emphasized projects, field visits and activities find a prominent place, with a view to developing skills, attitudes, habits and values leading to desired environmental action. At Secondary level, both in CBSE pattern and in State Board School pattern the course materials are built on fundamental understanding of ecological and bio-geographical principles.

The concepts covered at Secondary level are:

• Bio-sphere
• Greenhouse effect
• Ozone layer depletion
• Use of fertilizers and pesticides
• Wildlife protection
• Management of domestic and industrial waste
• Pollution of noise, air, water and soil and control measures
• Ecosystem
• Management of non-degradable substance
• Sewage disposal and cleaning of rivers
• Environmental laws and acts
• Environmental concepts also extend to subject areas like languages and social sciences which reinforce learning and internalization of all such concepts.

1.8.4 Environmental Education Curriculum at Higher Secondary level

This is the stage of diversification. Students opt for either the academic stream or the vocational stream. The treatment of concepts becomes deeper and more discipline oriented since the content caters to the demands of the concerned subject. Majority of the concepts are found in the textbooks of biology, chemistry and geography, which are optional subjects. Students opting for any one of these subjects would accordingly benefit in different aspects of Environmental Education (EE).

The coverage of Environmental Education concepts include

• Environment and sustainable development
• Atmospheric pollution - global warming
• Greenhouse effect
• Acid rain
• Ozone layer depletion
• Water pollution – International standards of drinking water
• Importance of dissolved oxygen in water
• Biochemical oxygen demand
• Ecology
In general, at higher secondary level, only those students selecting science subjects like mathematics, physics, chemistry and biology are exposed to Environmental Education. They are all more concerned with population ecology and the role of science and technology in eliminating or minimizing the various environmental problems. The Arts students are inadequately exposed to Environmental Education.

1.9 POLLUTION AND ITS TYPES

The word pollution is derived from Latin word “pollutionem” which means to soil or defile. Pollution may be defined as “an undesirable change in physical and chemical or biological characteristics of air, water and soil that may harmfully affect the life (or) create a potential health hazard of any living organism”. “Collin water 1971 defined as pollution as “any change in the physical, chemical or biological factors”.

The substance which causes pollution is called pollutant. The pollutant may be a solid, liquid or gaseous substances present in such concentration as may be or tend to be injurious to the environment.

The pollution has been classified on the basis of environment.

They are:

1. Air pollution
2. Water pollution
3. Soil pollution
4. Noise pollution etc.,

1.9.1 Air pollution

Air is a natural resource available in the atmosphere, necessary for every living organism for the process of respiration.

It is an atmospheric condition in which certain substances are present in concentrations which can cause undesirable effect on man and his environment. These substances include gases, particulate matter, radioactive substances etc.
Gaseous pollutant includes oxides of sulphur (mostly \( \text{SO}_2, \text{SO}_3 \)). Oxides of nitrogen (mostly \( \text{NO}, \text{NO}_2 \) or \( \text{NOx} \)) carbon monoxide, volatile organic compounds (mostly hydrocarbons) etc., particulate pollutants include smoke, dust, soot, fumes, aerosols, liquid droplets, pollen grains etc.

**Sources of Air pollution**

The sources of air pollution are natural and man made

**Natural sources:** The natural sources of air pollution are volcanic eruptions, forest fires, sea salt sprays, biological decay, photochemical oxidation of terpenes, marshes, pollen grains etc.

**Man made sources:** Man made sources include thermal power plants, industrial units, vehicular emissions fossil fuel burning, agricultural activities fertilizers plants, paper and pulp mills, automobiles etc., are the sources of air pollution.

**Effects of Air pollution**

**Effects on human health**

Years of exposure to air pollutants adversely affect the natural defenses and can result in lung cancer, asthma, chronic bronchitis, emphysema (damage to air sacs leading to loss of lung elasticity and acute shortness of breath), eye irritation etc.

**Effects on materials**

Because of their corrosiveness, particulates can cause damage to exposed surface. Presence of \( \text{SO}_2 \) and moisture can accelerate corrosion of metallic surface due to formation of sulphuric acid. Metal parts of buildings vehicles, bridges, wires and metallic railway tracks are affected.

**Effects on plants**

Air pollution affects plants by entering through stomata destroy chlorophyll and affect photosynthesis.
Effects on aquatic life

Air pollutants mixing up in rain can cause high acidity in fresh water lakes. This affects aquatic life, especially fish.

Other important effects of air pollution are

i. Green house effect

ii. Ozone layer depletion

iii. Acid rain

i) Green house effect

This is the warming that results when the earth’s atmosphere traps the sun’s heat. Carbon dioxide, methane, nitrous oxide, and other atmospheric gases, which allow sunlight to reach the earth but prevent heat from leaving the atmosphere, create greenhouse effect. These heat-trapping gases are often called greenhouse gases. Fuel burning and other human activities are increasing the amount of greenhouse gases in the atmosphere. Many scientists believe such an increase intensifying the greenhouse effect and raising temperature worldwide. This increase in temperature called global warming may cause many problems.

Effects of global warming

- Global Temperature increases.

- Rise in sea level with the increase in global temperature. Sea water will expand.

- Effects on human Health-The global warming will lead to changes in the rainfall pattern in many areas, thereby affecting the distribution of vector bone diseases like Malaria, Filariasis, Elephantiasis etc.,

ii) Ozone layer depletion

The earth is protected from the sun’s ultraviolet radiation by a layer of ozone high up in the stratosphere. Without this layer of ozone, life would have been impossible. But, again, due to human intervention there is a disruption of the ozone
layer caused by chemicals called chlorofluorocarbons (CFCs). These are pollutants that destroy the ozone layer in the upper atmosphere. CFCs are used in refrigerators and air conditioners and to make plastic foam insulation. As CFCs thin the ozone layer, more ultraviolet radiation reaches the surface of the earth. Overexposure to such radiation causes more problems.

**Effects of ozone layer depletion**

- The destruction of the ozone layer causes increased incidence of skin cancer and cataracts.

- It is considered a pollutant at ground level and constitutes a health hazard by causing respiratory diseases like asthma and bronchitis.

- Easy absorption of UV rays by the lens and cornea of eye will result in increase in incidents of cataract.

- Yield of vital crops like corn, rice soybean, cotton bear, pea sorghum and wheat will decrease

- Aquatic life badly affected by ozone depletion.

**iii) Acid rain**

It is a term for rain and other precipitation that is polluted mainly by sulfuric acid and nitric acid. These acids form when gases called sulphur dioxide and nitrogen oxide react with water vapour in the air. These gases come chiefly from the burning of coal, gas, and oil by cars, factories, and power plants. The acids in acid rain move through the air and water and harm to environment over large areas.

**Effects of acid rain**

- It causes deterioration of buildings especially made of marble, example monuments like Taj Mahal.

- It damages metals and car finishes.

- Aquatic life especially fish are badly affected by lake acidification.
Control of Air pollution

- Minimizing activities which cause pollution like transportation and energy production.
- Using low sulphur coal in Industries.
- Using mass transport system, bicycle etc.,
- Using non conventional sources of energy.
- Planting more trees.
- Reduction of pollution at source.

1.9.2 Water pollution

‘Water is life’ is a common saying because all organisms including man need water for various Purposes. Water is used by man for drinking, bathing, washing, navigation and in running factories and hydro-electric stations. Water has property to dissolve many substances in it. Therefore it can easily pollute. “Water pollution can be defined as “Any physical or chemical change in water quality that adversely affects living organisms or makes water unsuitable for desired uses.”

Causes of Water pollution

Pollution of water can be caused point source or non point source. Point sources are specific sites near water which directly discharge effluent into them. Major point sources of water pollution are

- Industries
- Power plants
- Underground coal mines
- Sewage treatment plants and
- Oil wells etc.

Non point sources of water pollution are scattered or diffuse, having no specific location where they discharge into a particulate body of water. Example Agricultural run-off, run of from roads, streets etc.
Effects of Water pollution

- Oxygen demanding wastes:- Dissolved oxygen (DO) is the amount of oxygen dissolved in a given quantity of water at a particular temperature and atmospheric pressure. Lower DO may be harmful to animals especially fish population.

- Waterborne diseases like cholera, dysentery, typhoid, jaundice etc. are spread by water contaminated with sewage,

- Pollutants such as heavy metals, pesticides, cyanides and many other organic and inorganic compounds are harmful to aquatic organisms.

- Excess of fluoride in drinking water causes defects in teeth and bones called fluorosis

Control of Water pollution

- Sources Reduction - The best way to reduce pollution is to avoid producing it.

- Ozonification - The ponds can be injected with ozone, so that the organisms get enough oxygen to live

- Drinking water should be boiled, cooked and drunk.

- Bleaching power in required quantities should be used to disinfect the drinking water.

- The sewage should be treated with “Sewage treatment plants”

- Pesticides insecticides should be used sparingly in agriculture.

- Cooling towers should be used in industries to control thermal pollution.

- Use of nitrogen fixing plants to supplement the use of fertilizers.

- Separate drainage of sewage and rain water should be provided overflow of sewage with rain water.
1.9.3 Soil pollution

Pollution of land mainly affects the soil due to accumulation of undesirable organic and inorganic materials disposed off as a result of human activity. The other possibility of land being polluted is through agricultural activities, disposal of municipal and industrial wastes etc. Thus the soil loses its fertility and characteristics and finally attains unsuitable condition for plant growth and life of microorganisms.

Causes of Soil pollution

- Dumping of various types of materials especially domestic and industrial wastes causes soil pollution.

- Domestic wastes include garbage, rubbish materials like glass, plastics, metallic cans paper, fibres, cloth, rags, containers, points varnishes etc. leakages from dumping sites and sewage tanks are harmful and toxic which pollute the soil.

- Industrial wastes are the effluents discharged from chemical industries, paper and pulp mills, textiles mills, refineries, pesticides and fertilizer industries, pharmaceutical industries, cement industries mining industries etc. Thermal power plants generate a large quantity of Fly ash. Huge quantities of these wastes are dumped on soil, thus contaminating them.

Effects of Soil pollution

Soil pollution severely affect human beings as well as animals as it results in decreased agriculture production and the consequent food shortage. The chemical fertilizers and pesticides that are used to increase agricultural productions not only degrade the soil through their excess used by also enter the food chain and effect the health of the people who consume that food.

Control of Soil pollution

- Effluents should be properly treated before discharging them on the soil.
• Use of pesticides and insecticides, and fertilizers should be controlled and minimized.

• Cattle dung should be used for methane generation.

• Effluents should be properly treated before discharging them on the soil.

• Microbial degradation of biodegradable substance is also one of the scientific approaches for reducing soil pollution.

The farmer should be educated on the harmful effects of the excess use of chemical fertilizers and other farming practices that are harmful to the soil.

1.9.4 Noise pollution

The unpleasant and unwanted sound is called Noise. Noise may not seem as harmful as the contamination of air or water, but it is a pollution problem that affects human health and can contribute to a general deterioration of environmental quality.

Sources of Noise pollution

The main sources of noise are various modes of transportation (like air, road, rail, transportation), industrial operations, construction activities and celebrations (social religious functions, elections etc.) electric home appliances.

Effects of Noise pollution

Noise causes the following effects.

• Interferes with man’s communication - In a noisy area communication is severely affected.

• Hearing damage - Noise can cause temporary or permanent hearing loss. It depends on intensity and duration of sound level.

• Physical and psychological changes - Continuous exposure to noise affects the functioning various systems of the body. It may result in hypertension insommmia (sleeplessness), gastro-intestinal and digestive disorders, peptic ulcers, blood pressure changes, behavioral changes, emotional changes etc
Control of Noise pollution

- Reduction in source of noise.
- Noise making machines should be kept in containers with sound absorbing media.
- Proper oiling will reduce the noise from the machinery.
- Use of sound absorbing silencers.
- Planting more trees having broad leaves in and around industry, schools, colleges to reduce noise pollution.
- Through law - Legislation can ensure that sound production is minimized at various social functions.

In India motor vehicles Act 1988 provides restriction on trucks using double sirens while passing through some localities.

1.10 INTERNATIONAL EFFORTS FOR ENVIRONMENTAL PROTECTION

i. Stockholm Conference (1972)

The United Nations Conference on the Human Environment (also known as the Stockholm Conference) was an international conference convened under United Nations auspices held in Stockholm, Sweden from June 5-16, 1972. It was the UN’s first major conference on International environmental issues, and marked a turning point in the development of International environmental politics.

The key issues addressed were the use CFC’s, which seemed to be responsible for the depletion of the ozone layer. Global Warming was discussed in this Conference.


The world community of States, assembled in Nairobi form 10th to 18th May 1982 to commemorate the tenth anniversary of the United Nations Conference on the Human Environment, held in Stockholm. Having reviewed the measures taken to
implement the Declaration and Action Plan adopted at that conference, it solemnly requests Governments and people to build on the progress so far achieved, but expressed its serious concern about the present state of the environment worldwide, and recognized the urgent necessity of intensifying the efforts at the global, regional and national levels to protect and improve it.

iii. Rio Declaration (1992)

The United Nations Conference on Environment and Development having met at Rio de Janerio from 3rd to 14th June 1992 for the first International Earth Summit, reaffirming the Declaration of the United Nations Conference on the Human Environment, adopted at Stockholm on 16th June 1972, and seeking to build upon it, with the goal of establishing a new and equitable global partnership through the creation of new levels of cooperation among States and key sectors of societies. The Summit was convened for addressing urgent problems of environmental protection and socioeconomic development at the Global level. The Rio Convention endorsed the Global Forest Principles and adopted Agenda 21 for achieving Sustainable Development in the 21st century.


The Kyoto Protocol is a protocol to the United Nations Framework Convention on Climate Change (UNFCCC or FCCC), aimed at fighting global warming. The UNFCCC is an international environmental treaty with the goal of achieving “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system”.

1.11 ENVIRONMENTAL PROTECTION IN INDIAN CONSTITUTION

The states responsibility with regard to environmental protection has been laid down under Article 48-A of our constitution, which reads as follows. “The state should Endeavour to protect and improve the environment and to safeguard the forests and wild life of the country”.

Environmental protection is a fundamental duty of every citizen under Article 51-A (g) of our constitution, which reads as follows. “It shall be the duty of
every citizen of India to protect and improve the natural environment including
forest, lakes, rivers and wild life and to have comparison for living creatures”.

Article 21 of the constitution in a fundamental right reads as follows: “No
person shall be deprived of his life or personal liberty except according to procedure
established by law”.

Article 48-A of the constitution comes under Directive Principles of safe
policy and Article 51-A (g) of the constitution comes under Fundamental Duties.

The state’s responsibility with regard to raising the level of nutrition and the
standard of living and to improve public health has been laid down under Article 47
of the constitution which reads as follows. “The state shall regard the raising the
level of nutrition and the standard living of its people and the improvement of public
health as among its primary duties.”

The 42nd amendment to the constitution in the year 1974 makes the
responsibility of the state Environment to protect and improve the environment and
to safeguard the forests and wild life of the country. The latter under fundamental
duties, make it the fundamental duty of every citizen to protect and improve the
natural environment including forests, lakes, river and wild life and to have
comparison for living creatures. Hence, environment protection and education on it
has the constitutional manmade.

1.12 ENVIRONMENTAL PROTECTION ACTS IN INDIA

Many acts have been introduced after 1947 (independence). Within two
years of Stockholm Declaration of 1972, Water act and Wildlife Protection Act were
passed in 1974. Within five years of Stockholm Declaration, the constitution of
India was amended to include protection and improvement of environment as
constitutional mandate. The protection and improvement of environment is now a
fundamental duty under constitution Act of 1976. Government of Indian has
established a National Committee on Environmental Planning and Co-ordination.
Some important legislation for the protection of environment in Indian is given
below:
5. Environment (Protection) Act, 1986

1.12.1 The Water (Prevention and Control of Pollution) Act, 1974

The Government formulated this Act in 1974 to prevent the pollution of water by industrial, agricultural and household waste water that can contaminate our water sources.

The main objectives of this Act as follows

- Prevention and control of water pollution
- Maintaining or restoring the wholesomeness of water.
- Establishing Boards for the prevention and control of water pollution.

1.12.2 The Air (Prevention and Control of Pollution) Act, 1981

The Government passed this Act in 1981 to clean up air by controlling pollution. It states that source of air pollution such as industry, vehicles, power plants etc., are not permitted to release particulate matter lead, Carbon monoxide, sulphur dioxide, nitrogen dioxide, nitrogen oxide, volatile organic compound or other toxic substances beyond a prescribed level.

The main objectives of this Act as follows

- To provide for the prevention, control and abatement of air pollution
- To provide for the establishment of Central and State Boards with a view to implement the Act.
- To confer on the Boards the powers to implement the provisions of the Act and assign to the Boards of functions relating to pollution.
1.12.3 The Wild Life (Protection) Act, 1972

The wild life Protection Act was passed by the Indian Parliament to protect India’s wildlife. This act safeguards wild animals, birds and plants. Under the Wildlife Protection Act Indian Board of Wildlife was established which is chaired by the Prime Minister of India, and Wildlife Advisory Board were constituted for each state.

The main objectives of this Act as follows

- Restriction and prohibition on hunting and trapping of wildlife.
- Protection of rare and specified plant species.
- Preparation of lists of endangered, rare and threatened species by the Botanical survey of India (BSI) and Zoological Survey of Indian (ZSI).
- Preservation of biological diversity by setting up and managing National Parks. Wild life Sanctuaries and Biosphere reserves.
- Empowering zoo authority with control of zoo and captive breeding of the endangered species.
- Control of trade and commerce in some wildlife species, wildlife products and trophies.
- Setting up of guideline for issuing license for arms in surrounding areas of wildlife sanctuaries.

1.12.4 The Forest Conservation Act 1980

The forest conservation Act was enacted to safeguard forests and their conservation.

The main objectives of this Act as follows

- Protection and conservation of forests.
- To ensure judicious use of forest products.
The important provisions of these acts as follows

- To check deforestation this causes ecological imbalance and leads to environmental deterioration.

- Puts restrictions on the use of forest land for non forest purpose pr conversion of reserved forest into non-reserve forest, without a prior approval of the Central Government.

- Provides provision of compensatory a forestation of an equivalent area of non-forest land or double the area of degrades forest for the diversion of a forest land.

- Exercises control over shifting cultivation and encroachments on the forestlands.

- Provides protection to hilly catchment areas, steep and other areas which are under erosion and landslides, and forest areas to save natural biodiversity.

- Put restrictions on felling of trees above 1000m altitude.

- Provides provision for the constitution of an advisory committee to advise the Central Government with regard to matters connected with conservation of forests.

1.12.5 The Environmental (Protection) Act 1986

The act has been passed by the parliament of Indian to give effect to the decisions taken at the Stockholm Conference in June 1972, relating to protection and improvement of environment and prevention of hazards to human beings, other creatures, plants and property.

Objectives of this Act as follows

- Protection and improvement of environment (water, air, land)

- Prevention of hazards to all living creatures (human, plants, animals and property.

- Maintenance of harmonious relationship between human beings and their environment.
The Central Government may by rules provide for

- Standards of quality of air, water or soil for various areas and purposes
- Permissible limits of pollutants (including noise) for different areas
- Procedure and safeguards for the handling of hazardous substance.
- Prohibiting and restricting the handling of hazardous substance in different areas.
- Procedure and safeguards for preventing accidents, which may cause environmental pollution and remedial measures thereafter.

1.13 ENVIRONMENTAL MOVEMENTS IN INDIA

There are some environmentalists in the present time who have made a mark in our country through environmental activism. Sh. Sunderlal Bhahunguna, (environmentalists), known for the “Chipkomovement” and “Tehri Bachao Andolan” Smt. Mdkha Patkar (Social worker) and Ms.Arundhati Roy (writer ) known for their “Narmada Bachavo Andolan”, the Magasaysay awardee Sh.Rajendra Singh (water man) known for his water conservation efforts are some such contemporary figures. Salim Ali is a renowned ornithologist, famous for his work on Indian birds. In modern India, our late Prime Minister Mrs. Indira Gandhi was instrumental in introducing the concept of environmental protection in the Constitution of India as a fundamental duty while Mrs.Menaka Gandhi, formerly Environment Minister, has worked a lot for the cause of wildlife protection. Citizen’s report on environment was first published by Sh.Anil Aggarwal, the founder Chairman of Centre for Science and Environment. Even with many such key persons leading the cause to environment, India is yet to achieve a lot in this field.

1.14 NATIONAL POLICY ON EDUCATION AND ENVIRONMENTAL EDUCATION

Plan Scheme entitled “Environmental Education, awareness and training was continued during 11th Five year plan under the Ministry of Environment and Forests. The scheme aims at enhancing the understanding of people at all levels about the
relationship between human beings and the environment and to develop capabilities / skill to improve and protect the environment. It covers educational / teaching aids in the formal education sector and training and man power development in environmental education. It also promotes environment education through existing educational / scientific research institutions.

Since the adoption of the National Policy on Education 1986. Environmental Education (EE) has received a sharper focus in the school curriculum framework through Formal Education is the mandate of the Ministry of Human Resource Development (MHRD), the Ministry of Environment & Forests (MOEF) interacts with the MHRD, NCERT and State Development of Education to ensure that environmental components are adequately covered at the school level. The Ministry also interacts with the UGC to ensure coverage of these components at the college level education.

As far as school system in concerned teaching Environmental Studies (ES) as EVS (Science) and EVS (Social studies) at the primary stage is followed. The curriculum of general education for the upper primary and secondary stages, as per the National Curriculum Framework (NCF) covers all cognitive aspects of the environment although Environmental Education was not perceived as a separate subject. Training modules for pre-service primary school teachers for each region, in-service training of key resource persons and teachers and dissemination of information about Environmental Education through NCERT journals, e.g. School Science are the modes of transacting environment education in the schools by the NCERT.

1.15 ENVIRONMENTAL AWARENESS

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

Environmental awareness among people of all levels is highly essential to ensure our environment is safe to live and to protect the life on this planet from the adverse impacts of the human actions that cause environmental degradation.
Firstly, all Indian citizens should realize that by Article 51-A (g) of our constitution, it should be the fundamental duty of every citizen ‘to protect and improve the natural environment including forests, lakes, rivers and wildlife and to have compassion for living creatures’. The fundamental duty can be effectively performed only with sound awareness of the citizens.

Every third person in India drinks water that is not safe to drink. Nearly, a third of the population live in urban cities and towns and in the most of these places, even clean air to breath is a limiting factor. Lack of proper sanitation facilities clubbed with low awareness levels has been the major cause for health problems in rural India. Thus, there are several areas where awareness is required to make India environmentally safe develop on sustainable basis.

Environmental awareness is required for everybody, including the policy makers, executives, judiciary and the media also. A high level of awareness is needed to these groups as their influence on the environment and the society as quite extensive.

Mahatma Gandhi said, it is important to distinguish between the need and the greed, before we use our natural resources. It is this awareness that is the need of the hour.

1.16 ACADEMIC ACHIEVEMENT

Academic achievement is the educational goal that achieved by a student, teacher or institution achieves over a certain period. This is measured either by examinations or continuous assessments and the goal may differ from an individual or institution to another.

Academic achievement is the accomplishment or acquired proficiency in the performance of an individual in a given skill or body of knowledge. Academic achievement means “Knowledge attained and skill developed in the school subjects usually designated by test scores or by marks assigned by teachers or by birth” Achievement can be measured with the help of tests, verbal or written of different
kinds. Since academic achievement is the criterion for selection, promotion or recognition in various works of life, the importance academic achievement cannot be ignored. (Panigrahi, 2005)

The word academic achievement become more and more competitive quality of performance has became the key factor for personal progress. Parents desire that their children should climb the ladder of performance as high as possible. This desire for a high level of achievement puts a lot of pressure on student’s teachers, schools and in general on the educational system itself. In fact it appears as if the whole system of education revolves around the academic achievement of students through various other outcomes are also expected from the system. Thus a lot of time and effort of the schools are used for helping student to achieve better in their academic endeavors. The academic achievement is regarded as synonym of scholastic achievement.

Principles of Academic achievement of the students

- For affective education, the measurement of educational achievement is essential.
- An educational test is no more or less than a device for facilitating extending and refining a teacher’s observation of student achievement.
- Every outcome of education can be measured.
- The most important educational achievement is command of useful knowledge.
- Written tests as well suited to measure the student’s command of useful knowledge.

Thus, academic achievement is the result of achievement tests which measure accomplishment in a specified area of work.

According to Good (1959) “Academic achievement is accomplishment or proficiency of performance in a given skill or buy of knowledge.” It means performance in school or college in a standardized series of educational tests. The term is used more generally to describe performance in the subjects of the curriculum.
Factors affecting achievement

Some of the important factors that affect the academic achievement of the students at all levels are given below.

- Home is the first school for every student and parents are the first teachers. If the home environment is good automatically student’s nature in the school is good. Hence, the relationship with the family members, their educational standards atmosphere of the home, social status etc. will definitely influence the students academic achievement.

- After home, the students spend more time in the educational institution i.e., school / college. Hence the environment of the institution should be good and attractive both academically and administratively.

- Curriculum is also one of the factors for developing achievement. Curriculum should construct on the standards of the students.

- Intelligence also plays a vital role in developing achievement of the students. It is general observation that intelligent students stand in top positions in their achievement.

- Community is also an important factor for developing good achievement. Community has to provide the community centers such as library facilities resources centers, information centers etc.

- Apart from the above factors gender, caste, management of the institution, age, marital status, social environment and anxiety and stress of the student will also influence their level of academic achievement.

1.17 RESUME OF THE SUCCEEDING CHAPTERS

Chapter – II deals with a brief review of related research work done in the area of environmental awareness / achievement.

Chapter – III deals with present study, i.e., statement of the problem, need for the study, purpose of the study, operational definitions of various terms, scope of the study and objectives of the study, hypotheses to be tested and variables studied and delimitations of the study.
Chapter – IV deals with tools employed, methods of collecting data, and statistical techniques employed in the analysis of data.

Chapter – V deals with analysis of data, and a detailed discussion of the results of the present study.

Chapter – VI deals with summary of the investigation, major findings, conclusions, educational implications, recommendations and suggestions for further research.

Bibliography and Appendices are given at the end of the thesis.