UG S2 - 03
(IDC)

FOUR YEAR BACHALOR'S DEGREE COURSE

(CBCS in Accordance with NEP 2020)

SEMESTER - II

ENVIRONMENTAL EDUCATION

EDUCATION

Indira Miri School of Education

KRISHNA KANTA HANDIQUI STATE OPEN UNIVERSITY

COURSE INTRODUCTION (UG ED S2 02)

This is the interdisciplinary course for UG ED second semester. Here, in this course, you will be able to understand basic concept about environment education. This course contains 11 units.

BLOCK INTRODUCTION

In this course, the *First Unit* deals with the meaning of environmental education, its nature and scope. The *Second Unit* discusses on methods of environmental education. The *Third Unit* deals with the environmental movements in India. The *Fourth Unit* discusses on media of Environmental education. The *Fifth Unit* deals with environmental education programmes for different levels of education. The *Sixth Unit* explains about environmental degradation. The seventh unit gives a detail description about environmental pollution. The *Eight Unit* gives a detail elaboration on *the conservation and protection of environment. The ninth Unit* deals with a detail discussion on *Environmental Protection and legal provisions . Again in the Tenth unit* a reflection is tried to thrown on Sustainable Development. *In the eleventh Unit* a detail discussion is done on *Environmental Education, its problems and prospects with special reference to Assam.*

While going through a unit, you will notice some along-side boxes, which have been included to help you know some of the difficult, unseen terms. Some “ACTIVITY’ (s) have been included to help you apply your own thoughts. Again, we have included some relevant concepts in “LET US KNOW” along with the text. And, at the end of each section, you will get “CHECK YOUR PROGRESS” questions. These have been designed to self-check your progress of study. It will be better if you solve the problems put in these boxes immediately after you go through the sections of the units and then match your answers with “ANSWERS TO CHECK YOUR PROGRESS” given at the end of each unit.

Unit 7: Environmental Pollution **112-132**

Meaning of environmental pollution, types of environmental pollution- air pollution, water pollution, land or soil pollution, solid waste pollution, noise pollution, radio-active pollution.

UNIT 8 : Conservation and Protection of Environment **133-151**

Concept of conservation and protection of environment, legal and Constitutional provisions for conservation and protection of environment, role of individual and society towards environmental conservation and protection; concept of sustainable development, characterstics and education for sustainable environment

UNIT 9: Environmental Protection and Legal Provisions **152-166**

Meaning of Conservation and Protection of Environment,Characteristics and Objectives of Conservation and Protection of Environment, Categories of Conservation and Protection of Environment, Legal Provisions for Conservation and Protection of Environment, Constitutional Provisions for Conservation and Protection of Environment.

UNIT 10 : Sustainable Development **167-177**

Concept of Sustainable Development, Characteristics of Sustainable Development , Need of Sustainable Development, Education for Sustainable Development, Environmental Education Emphasised at Higher Secondary Level,How to Make Environmental Education Effective at Secondary School Level in India, Programme of Environmental Education at the Higher Educational Institutes.

UNIT 11 : Enviornmental Education: its Problems and Prospects with special reference to Assam **178-192**

Problems of environmental education, specific environmental problems in Assam, its prospects, provisions of environmental education in Assam.

UNIT 1: MEANING OF ENVIRONMENTAL EDUCATION

UNIT STRUCTURE

1.1 Learning Objectives

1.2 Introduction

1.3 Meaning and Nature of Environmental Education

1.3.1 Definition of Environmental Education

1.3.2 Characteristics of Environmental Education

1.4 Aims and Objectives of Environmental Education

1.5 Guiding Principles of Environmental Education

1.6 Scope of Environmental Education

1.7 Let Us Sum Up

1.8 Further Reading

1.9 Answers to Check Your Progress

1.10 Model Questions

1.1 LEARNING OBJECTIVES

After going through this unit you will be able to-

- discuss the meaning and nature of environmental education
- explain the characteristics, aims and objectives of environmental education
- identify the guiding principles of environmental education
- explain the scope of environmental education.

1.2 INTRODUCTION

With the advancement of science and technology mankind has progressed well. But this has drastically changed man's relationship with environment since the prehistoric time to the present day advanced period. The industrial and scientific revolutions have led to rapid changes in our environment. Continuous exploitation of nature has put mankind in a crucial state of environmental crisis. But, the fact is that, the welfare and existence

disturbance in ecological balance.

Man is a unique and dominant species that has been interfering with the environment in various ways, such as, clearing forests, breaking grasslands, digging, drilling, mining minerals etc. Although, in the beginning, the environment of early men consisted of only physical aspects of the planet earth, with the advancement of society men extended their environment through social, economic and political functions. Of late, humans' have exploited some of the valuable natural resources like mineral oil, natural gas, coal etc. Man's interference with environment has often led to extinction of certain animal species, disturbing the ecological balance in nature. The term environment includes all those external forces that have influenced the conditions which affect life, nature, behaviour and growth, development and maturity of living organisms. It consists of the sum total of the stimulation that an individual receives from conception to death. Thus, environment is an inseparable whole and is constituted by the interacting systems of physical, biological, and cultural elements which are inter-related to each other.

Education is an independent field of study or discipline which is concerned with the process of development, i.e., teaching-learning, training and instruction. It aims at the physical, social, emotional, and intellectual development of the child. The chief concern of all educationists is with the environment of men. But humans cannot exist or live in isolation from the other forms of life and also from plant life. So, the educationists should be concerned with the environment of all types of biological population. Environmental education is that branch of education which provides sufficient knowledge and understanding about the problems of environment. It contributes towards solving them, and also develops attitude and values conducive to environmental protection and understanding of interdependence of nature and people.

Environmental education aims at generating widespread awareness of environmental problems. It not only educates the world population about the natural environment and its problems, but also aims at developing knowledge, attitude and skills necessary to protect the natural balance in

Working Meeting on Environmental Education in the School Curriculum held under the auspices of UNESCO in Paris in 1970 remarked.

"Environmental Education is the process of recognizing values and clarifying concepts in order to develop skills and attitudes necessary to understand and appreciate the inter-relatedness among man, his culture and his biophysical surroundings. It also entails practice in decision making and self-formulation of a code of behaviour about problems and issues concerning environmental quality."

The Finnish National Commission in a seminar held in 1974 stated:

"Environmental Education is a way of implementing the goals of environmental protection. Environmental education is not a separate branch of science or subject of study. It should be carried out according to the principle of lifelong integral education."

The Report of a Conference of African Educators held at Nairobi in 1968 stated:

"To create an awareness and an understanding of the evolving social and physical environment as a whole, its natural, manmade, cultural, spiritual resource, together with the rational use and conservation of the resource for development."

Mishra (1993) opines that, "Environmental education appears to be a process that equips human beings with awareness, knowledge, skill, attitude and commitment to improve the environment."

According to R.A. Sharma (1996):"Environmental Education refers to the awareness of physical and cultural environment and perceive its relevance for real life situation. The problems and issues are to be identified. The imbalance of environment are to be improved in view of sustainable development."

All the definitions mentioned above would remain incomplete, unless the definition formulated in the Tbilisi Conference held at Georgia in the USSR in October, 1977 under the auspices of the

- Environmental education identifies the imbalances of environment and tries to improve it in view of sustainable development.
- It explains the co-existence of both living and non-living organisms and their contribution to the nature for its sustenance.
- Environmental education develops skills, attitudes, feeling and values needed to preserve and maintain environment.
- It utilizes educational approaches methods and techniques of teaching to identify the real causes of environmental problems and gives importance on recognizing the interrelatedness of man with his cultural and biological surroundings.
- Environmental education involves both theoretical and practical aspects of environment to improve the imbalances and prevent the deterioration or pollutions.
- It appears to be an educational process that generates in learners positive value towards eco-equilibrium of a pollution free environment.

CHECK YOUR PROGRESS



Q 1: Fill in the blanks :

i) Environmental education is a ..... branch of study.

ii) Environment is ..... under which a person, animal or a plant lives.

iii) Environmental education educates the world population to protect the nature in ..... environment.

iv) Environmental education should be_____ discipline making possible to teach it from a holistic perspective.

Q 2: What is meant by Environmental Education?

.....

mankind and the duty of every generation to leave this planet as a befitting place for mankind to live infinitely.

- To enjoy life and prosper peacefully by respecting the laws of nature.

1.5 GUIDING PRINCIPLES OF ENVIRONMENTAL EDUCATION

According to Tbilisi Conference USSR (1977) the guiding principles of environmental education are:

- The environment has to be considered in its totality natural as well as built, technological and social, economic, political, moral, cultural, historical and aesthetic.
- Environmental education should be a continuous life process which begins at the pre-school level and continues through all formal and non formal stages.
- Environmental education should be interdisciplinary in its approach. The specific contents of each discipline should play a specific role in making possible a holistic and balanced perspective.
- Environmental education should emphasize active participation in preventing and solving environmental problems.
- Environmental education should examine major environmental issues from local, national, regional and international point of view so that learners get insights into environmental conditions in other geographical areas.
- Environmental education should focus on current and potential environmental situations, while taking into consideration the historical perspective.
- Environmental education should explicitly consider environmental aspects in the planning for development and growth.
- Environmental education should emphasize the complexity of environmental problems and thereby the need to develop critical thinking and problem solving skills.
- Environmental education should be able to promote the value and

of environmental education and its relationship with other subjects and environmental education as a discipline.

- **Concept of Ecology and Environmental Pollution:** Ecology is the study which deals with the relationships of life forms with each other and with their surroundings. Pollution refers to the contamination of the environment-air, water and land with harmful wastes resulted from human activities. Environmental pollution has badly affected the whole biosphere and has become a major world-wide threat. This area includes concept of ecology and ecosystem, quality of environment, pollution and degradation, environmental pollution- air, water, land and noise, human ecology and environmentalism, interdependency in environment- food chains and food web flow of energy and biochemical cycles.
- **Concept of Educational and Psychological Environment:** Education aims at the physical, social, emotional and intellectual development of the child in which environment has a significant role. In effective educative process, teacher must know his student and the environment. This is one of the very important areas in the scope of environmental education which includes concept of educational environment, growth and development, psychological environment and mental health, population explosion and environment.
- **Concept of Environmental Management:** Environmental management is the process to improve the relationship between man and environment so that the quality of both the environment and human society may be improved. This improvement of relationships between man and environment may be achieved through check on destruction activities of man, conservation, protection, regulation and regeneration of nature. This is a very broad area come under the scope of environmental education. It includes meaning and nature of environmental management, teacher education and environmental education, role of media in environmental education, social forestry and environmental education, problems and remedies of environmental education and evaluation of environmental education.

- Environmental education is that education which provides sufficient knowledge and understanding about the problems of environment. It aims at generating widespread awareness of environmental problems.
- Environmental education is nothing but teaching a man how to interact with the surrounding world so as to improve his or her own world. Thus, it is a medium and a process of education that covers man's relationship with his natural and man-made surroundings.
- Environmental education discusses the effects of population explosion, industrialization, pollution etc. on environment and identifies the imbalances of environment and tries to improve it in view of sustainable development. It involves both theoretical and practical aspects of environment to improve the imbalances and prevent deterioration and pollution. The guiding principles of environmental education are:
  - Environment in its totality
  - As a life long process
  - As an interdisciplinary approach
  - Focus on complexity of environmental problems
  - Emphasize active participation in preventing and solving environmental problems
  - Develop environmental sensitivity, knowledge etc
- The scope of environmental education includes concept of environmental education, concept of ecology and environment, concept of educational and psychological environment, and concept of environmental management.



1.8 FURTHER READING

1) Akhatar, P. and others (2008) : Environment and Population Education, Assam Book Depot., Guwahati.

2) Barua, J. (2009) : Paribesh AruJanasankhya Siksha, Chandra Prakash, Guwahati.

(iv) To provide opportunities for active participation in working for prevention and solution of environmental problems.

Ans to Q No 5: (i) Environmental education should consider environment in its totality

(ii) Environmental education should be a life-long process

(iii) It should be considered an interdisciplinary approach

(iv) It should focus on current environmental problem

(v) It should utilize various educational opportunities for teaching about environment and its protection etc.

Ans to Q No 6: (i) concept of environmental education

(ii) concept of ecology and environmental pollution

(iii) concept of educational and psychological environment, and

(iv) concept of environmental management.



1.10 MODEL QUESTIONS

A) Very Short Questions (Answer each question in about 50 words)

Q 1: What is meant by environment?

Q 2: What is meant by ecology?

Q 3: What should be the role of education for sustaining the environment?

Q 4: What is meant by sustainable development?

Q 5: What is meant by environmental management?

B) Long Questions (Answer each question in about 300-500 words)

Q 1: Define 'Environmental Education' and write a note on its characteristics.

Q 2: What are the aims and objectives of environmental education? Discuss the role of education in the development of environmental awareness.

Q 3: What is environmental education? Discuss its nature and scope.

Q 4: What is the need and importance of studying environmental education in the present day context? Explain citing examples.

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the laymen. In this unit, we will discuss about different methods of environmental education.

2.3 TEACHING OF ENVIRONMENTAL EDUCATION

Environmental education is considered as most significant programme for making people aware of the environmental degradation. People can be made aware through teaching and organization of different programme. Teaching of environmental education involves both practical (hands-on) and theoretical (understanding) aspects. The major objectives of environmental education are creating awareness, changing attitude and bringing people into action towards environmental conservation and protection. It covers cognitive, psychomotor and affective domains of teaching-learning. The strategies of teaching and learning are wide ranging, based on its contents and components, levels of education and the objectives of environmental education. For teaching environmental education, the different methods may be very helpful.



LET US KNOW

Teaching of environmental education covers cognitive, psychomotor and affective domains of teaching-learning. The strategies of teaching and learning are wide ranging, based on its contents and components, levels of education and the objectives of environmental education.

2.4 DIFFERENT METHODS USED IN ENVIRONMENTAL EDUCATION

Teaching of environmental education is a not an easy task. It is as complex as teaching other significant topics or discussing some serious issue. To discuss such critical issue, it is essential to adopt significant means by the teachers. There are different methods of teaching, the teacher can follow different methods for imparting knowledge on environmental education to the students. The methods used by the teachers are discussed here-



CHECK YOUR PROGRESS

Q 1: What are the types of interaction involved in discussion method?

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2.4.2 Project Method

Another important method of environmental education is Project Method. It is any purposeful activity. Project is an activity undertaken by the pupils for the solution of a problem. The activity undertaken leads to learning. Some basic principles of the project method are:

- **Activity:** The project should involve activity which is either mental or motor.
- **Purpose:** Activity should be purposeful; it should be a felt need of the pupils.
- **Experience:** Project undertaken should provide varied type of experience to the pupils- manipulative, concrete, mental etc.
- **Reality:** Project undertaken should provide real experiences.
- **Freedom:** The pupils should be free to undertake the different activities connected with the project.
- **Utility:** The activity undertaken should be useful.

Project method helps the students to acquire knowledge about particular topic through their active involvement. It not only help them to gather knowledge but also ensures self-learning. Basically in project method, students are given some particular topic or area to work on. Through observation, interview and other means students gather data on the selected theme and prepare their project followed by analysis. The report may be hand-written or typed, or it may include charts, models, pictures etc. They can take help of their teachers as well as parents to accomplish the project.

The role of the teacher is to help the students throughout the

the process of science learning.

Problem solving is the act of defining a problem, determining the cause of the problem, identifying, prioritizing and selecting alternatives for a solution and implementing a solution.Problem-solving method that aims at presenting the knowledge to be learnt in the form of a problem. It begins with a problematic situation and consists of continuous, meaningful, well-integrated activity. The problems are test to the students in a natural way and it is ensured that the students are genuinely interested to solve them.

In this method, students are given some problem, which they need to solve by finding alternative solutions. The report is presented followed by the solutions. In environmental education, the students can be given some problems like-water pollution, noise pollution, the students through finding alternative solutions to this problems, can gain depth of the such serious problems. Therefore, in environmental education teaching, problem solving is considered the most important.

LET US KNOW



Problem solving is the act of defining a problem, determining the cause of the problem, identifying, prioritizing and selecting alternatives for a solution and implementing a solution.

CHECK YOUR PROGRESS



Q 2: Write three characteristics of problem solving method.

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2.4.5 Dramatization

Drama, as we all know, is primarily a living experience. It helps the child to expand the boundaries of his life space, enables him to express his imagination, concepts and feelings about events and happenings. Acting is a wonderful way of learning.Dramatic teaching is integrated into many different types of curriculum especially in the lower level of education. It is a method which refers to a collection of teaching tools that include traditional drama techniques like improvisation, storytelling, role playing and games. Dramatization technique emphasizes on engaging students through interactive activities. There are many ways to use dramatization teaching methods in the classroom. Teachers can use it to help students gain deeper insights into topic, build on concepts and themes. Moreover it is also used as a means to test student knowledge. A dramatic performance unfolds with a plot. The enactment of a play illumines the responsibilities of democratic citizenship; provide children with an understanding of the problems of community living, and a realization of the importance of participating in community activities. It can convey the concepts of good environment and the abuse of environment.

The role of a teacher is very significant in using dramatics as a method of teaching environmental education. He/she may ask his students to prepare scripts on environmental problems, prepare costumes, do the art work necessary for staging, plan a programme and send invitations and make all necessary arrangements. Thus, by engaging in a play, children explore in their own way, the activities and relationships of human living and acquire the much needed information and skills. Environment is a serious issue, and it's very essential to make children from grassroots level. Dramatization technique helps the children to realize its importance.

In the observation method, awareness of the environment is provided through the perception of the students. It involves the observations, imagination and ability of discovering the cause and effect relationship among environmental components. Thus, it provides the learners a real exposure to environmental education. Field trips also develop the ability to appreciate natural environment and the ability to interpret one's own experiences and observations. For developing feelings of co-operation, group activities or team work etc., fieldtrip is one of the best methods of teaching environmental education.While organizing field trips, certain points should be considered important to make teaching learning effective. They are as follows:

- the specific objectives should be formulated
- to realize these objectives, ways and means should be identified
- a schedule containing date, time, number of students, duration and financial aspects should be finalized
- the means of transportation and time schedule should be finalized
- the visiting organizations should be contacted for the necessary arrangement

The success of field trips depends upon the selection of places and schedule of observation by the students. Every student should prepare a report about his observations. Every field trip should be followed by group discussion to highlight the environmental components.



LET US KNOW

Field trips is a method which develops the ability among students to appreciate natural environment and the ability to interpret one's own experiences and observations.

environment related issues like-scarcity of water in the cities, water pollution in sea, disposal of garbage etc.

- Project Method is a purposeful activity. Project is an activity undertaken by the pupils for the solution of a problem.
- Some basic principles of the project method are- Activity, Purpose, Experience, Reality, Freedom and Utility.
- The role of the teacher in project method is to help the students throughout the project by selecting an appropriate subject; formulating objectives of the project, checking students' progress regularly, suggest modification etc.
- In problem solving method, the students are expected to observe, understand, analyze, interpret and find solutions, and perform applications that lead to a holistic understanding of the concept.
- In this method, students are given some problem, which they need to solve by finding alternative solutions. In environmental education, the students can be given some problems like-water pollution, noise pollution, the students through finding alternative solutions to this problems can gain depth of such serious problems.
- Observation method helps us to know better as well as to establish a harmony with the nature. This will help the young students to realize the importance of environment and how can we save it from disasters.
- Observation under the careful guidance of teacher, on the immediate natural surroundings, geographic facts and relationships prove invaluable for the teaching of environmental education.
- Dramatic teaching is integrated into many different types of curriculum especially in the lower level of education.
- It is a method which refers to a collection of teaching tools that include traditional drama techniques like improvisation, storytelling, role playing and games.
- Fieldtrip is a trip made by student and teachers to see and study something naturally, culturally, socially or geographically significant.
- Field trips also develop the ability to appreciate natural environment and the ability to interpret one's own experiences and observations.



2.8 MODEL QUESTIONS

A) Short Questions: (Answer each question in about 150 words)

Q 1: Write short notes on Teaching of environmental education.

Q 2: Discuss project Method. What are its characteristics?

Q 3: What are the role of teacher in problem solving method?

Q 4: Write the importance of fieldtrip.

B) Long Questions: (Answer each questions in about 300-500 words)

Q 1: Discuss any two effective methods of teaching environmental education.

Q 2: How dramatization helps in eradicating environmental degradation? Discuss from your point of view.

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3.3 MEANING OF ENVIRONMENTAL MOVEMENT

Any socio-political movement for the conservation or improvement of the state of the environment is defined as environmental movement. Some other popular terms like 'green movement' or 'conservation movement' are also alternatively used for the same. These movements favour the sustainable development and management of natural resources. The movements apply various public policies to protect the environment from different dangers. Major concerns of the movements are ecology, health and human rights, awareness, protection of the future consequences etc. Most of the environmental movements are highly organized and institutionalized. Environmental movements are started by local people that brought a global impact as a whole.

3.4 CHIPKO MOVEMENT

The Chipko movement was a forest conservation movement started in 1970s in Uttarakhand and then at other parts of the foothills of Himalayas. It led many future environmental movements all over the world. This non-violent movement inspired many similar eco-groups to slow down deforestation, expose injustices, increase mass awareness to save trees, increase ecological awareness etc. The movement practiced methods of Satyagraha where both male and female activists from Uttarakhand played a vital role. Some of the famous women who fought for the protection of forests were Gaura Devi, Sudesha Devi, Suraksha Devi, Bachni Devi, Dev Suman, Mira Behn, Sarala Behn, Amrita Devi and others. This ecofeminism movement aimed to protect and conserve the trees and forests from being destroyed. The word 'Chipko' means 'to embrace'. The villagers hugged the trees and protected them from wood cutters. It was based on Gandhian philosophy of peaceful resistance to achieve the target. The movement was first started in the Chamoli district in the year 1973.

The first Chipko action took place in 1973 and got popularity in many districts of the Himalaya in Uttar Pradesh. The villagers hugged the trees

Protests were done in different villages like Chamoli, Mandal etc. throughout the region. But, one of the major protests occurred in 1974 near the village of Reni, where more than 2,000 trees were marked to be cut. But, the women of the village, led by Gaura Devi, refused to move out of the forest and forced the loggers to withdraw. The incident prompted the state government to form a committee to investigate the status of deforestation in the Alaknanda valley and ultimately banned the commercial logging in the area for 10-year. The Chipko movement emerged as a peasant and women's movement for forest and environmental rights, though the protests were decentralized and autonomous. In 1978, in the Advani forest of Tehri Garhwal district, another famous activist Dhoom Singh Negi fasted to protest the auctioning of the trees and other resources of forest. There the local women tied sacred threads around the trees and read from the Bhagavad Gita. In other areas, chir pines that produce resin were bandaged to protest their exploitation. In Pulna village of Bhyundar valley (1978), the women confiscated the tools and other equipment of the loggers' and issued receipts for them for claiming after leaving the forest. Between the years 1972 to 1979 approximately 150 villages were involved with the Chipko Movement. It resulted in 12 major and many minor protests in Uttarakhand.

Chipko Movement was the outcome of many decentralised and local autonomous initiatives. Its leaders and activists have primarily the village women, acting to save their means of subsistence and their communities. The women were also supported by the men and some of them have given wider leadership to the movement too. The incident also inspired other rural women, who in 1970's launched such similar movements in different parts of India. They actively participated in the movement to stop deforestation and its future consequences. The movement created different project-oriented protests. It included the entire ecology of the region and started the Save Himalaya Movement. Bahuguna marched 3,100 miles across the Himalayas to bring the movement to prominence between 1981 and 1983. Later many protests were observed on the Tehri dam on the Bhagirathi River and various mining operations were also seen. More than one million

rationally'. The Appiko movement was highly inspired by the famous Chipko Andolan of Uttarakhand in the Himalayas where the natives saved the trees by hugging them. The villagers of Uttara Kannada district of Karnataka also launched a similar movement to save their forests. In 1983 (September), the movement was basically started by the representatives of a 'Yuvak Mandali'. This group observed that in some easily accessible areas, there was an excessive concentration of trees reserved for felling which again caused excessive damage to other trees too. To save the Western Ghats, the villagers of Salkani including all men, women and children hugged the trees in the Kalase forest. In Kannada, 'hugging' means 'appiko'. This movement created a new awareness among people.

Various techniques were used in Appiko Movement to raise awareness among people. For this foot marches in the interior forests, slide shows, folk dances, street plays, lectures, meetings etc. were organized. The Movement also made an attempt to promote afforestation on denuded lands of the region.

The villagers took interest in growing saplings and decentralized nurseries. In 1984-1985, 1.2 million seedlings were grown by people in the Sirsi area. It was done with the help and cooperation of the forest department. The department supplied the plastic bags for growing saplings. Appiko activists have grown saplings only to meet their own needs only.

The villagers also initiated a process of regeneration in barren common land. The Yubak Samiti took the responsibility for the project and the whole village was united to protect this land basically from grazing, lopping and fire. Again, the forest department focused in resorting the mechanized planting of exotic species. It used a huge amount of fertilizers on these plantations though this was quite harmful for the soil and the trees in the area. These two techniques were mainly performed under the movement: firstly, the forest department's method which is a capital intensive, and secondly, the techniques of the local people of growing through regeneration which is a natural process for sustainable development of the soil.

Another activity in the Appiko Movement was related to the rational use of the ecosphere through introducing alternative energy sources which

Silent Valley gained an epic dimension, when the Save Silent Valley Movement stirred by different NGO's, scientific communities and conservation activists with social awareness resulted in the decision to abandon a hydroelectric project in that area. At first the decision was made by the British government to build a dam across *the river*, which originates from the forest. Sairandhri, a place near the Kunthipuzha River was identified as an ideal site for electricity generation in the year 1928. But the project was not implemented at that time. In 1951, the state government first conducted a survey for hydroelectric project and in the year 1973 the Planning Commission of India approved the plan of the project. That created the controversy on whether to opt for the conservation of nature or to promote development.

The Silent Valley harbours approximately 108 varieties of Orchids, various medicinal plants, some rare flowering plants, 23 mammalian species, 3 endangered species like Tiger, Lion-tailed Macaque, and Nilgiri Langur. To protect an evergreen tropical forest, the Silent Valley, a social movement was started in 1973 by the Kerala Sastra Sahithya Parishad (KSSP) and an NGO led by school teachers. Save Silent Valley movement was started to save the valley from being flooded by a hydroelectric project. The river Kuntipuzha flows 15 km southwest from Silent Valley. It takes its origin in the lush green forests of the valley. In 1970 Kerala State Electricity Board (KSEB) proposed a hydroelectric dam across the river which runs through Silent Valley. It submerged 8.3 sq km of the evergreen forest. The Planning Commission approved the project at a cost of about 25 crores.

After the announcement of dam construction it created a great concern about the endangered lion-tailed macaque and the issue was brought to public attention. Romulus Whitaker was probably the first person to draw public attention to the remote area. In the year 1977 the Kerala Forest Research Institute conducted a study on the area and proposed to declare it as a biosphere reserve.

The KSSP effectively aroused public opinion by publishing a techno-economic and socio-political assessment report on the Silent Valley hydroelectric project. They published a campaign booklet titled 'The Silent Valley Hydroelectric Project – A Techno-Economic and Socio-Political

the Tehri Dam. Today, the virgin forests and the unparalleled beauty of the national park bear silent testimony of the achievement of some environmentally conscious individuals and their combined efforts.



CHECK YOUR PROGRESS

Q 3: Where is the Silent Valley located?

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Q 4: Who inaugurated the Silent Valley National Park?

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Q 5: Give the meaning of the term 'Chipko'

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Q 6: Name some women activists of the Chipko movement.

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3.7 CHILIKA BACHAO ANDOLAN

Chilika is Asia's largest brackish water lake which lies on Bay of Bengal in Orissa with an area of 1,200 sq. km. This water lagoon has been a source of livelihood for the poor people residing in more than 100 fisher hamlets surrounding the lake covering the districts of Puri, Khurda and Ganjam of Odisha. Millions of migratory birds from the far corners of the world can be seen here in winter. Chilika is a major attraction for nature lovers too. But over the last few decades the area experienced conflicts and violence.

Chilika Bachao Andolan was a movement by the people, mostly fishermen, who posed a successful resistance to the Integrated Shrimp Farm Project (ISFP). It was a joint venture of the Tata Iron and Steel Company and Government of Orissa for prawn cultivation and export. Due to a rise in demand of shrimp exports to USA, Japan and European countries, Indian industrialists and politicians tried to grab the opportunity to increase their

On 29th May, 1999 over five thousand fishermen began to demolish all the illegal prawn farms. Surprisingly, the police supported all prawn barons and shot 3 fishermen dead and injured many other protesters. It was done even after receiving the order of the Supreme Court (1996) to remove all farms within 1000 metres of the lake. Again, India is a signatory to the Ramsar International Treaty on wetland preservation where the lake Chilika is identified as one of the world's most important water bodies because of its unique ecosystem. In October 1992, the central government refused to grant environmental clearance to the Tata Project. In November 1993, a judgment came from Division Bench of the Orissa High Court to protect the Chilika Lake Ecosystem. The movement is a part of a wider campaign by the NFF against the industrial acqua-culture. The Chilika (Regulation of Fisheries) Bill, 2011 has been pending for 10 years, following opposition from local fishermen. The Bill was first proposed in 2001 and has provisions to make the illegal shrimp farmer get legal status to promote non-traditional fishing in the lake. Even today, the issues are not resolved. The situation is same as it was seen before two decades, and the fishermen are still fighting for their livelihoods, the environment is being polluted and the protests remain ignored.



CHECK YOUR PROGRESS

Q 7: Who started formally the Chilika Bachao Andolan?

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3.8 NARMADA BACHAO ANDOLAN

Narmada Bachao Andolan is one of the most powerful mass-movement that started in 1985. It was started against the construction of a huge dam on the Narmada river. It is India's largest west flowing river which supports a large group of people with distinguished culture and tradition ranging from the indigenous and rural population. The proposal of Sardar

Medha Patkar. Patkar had been organizing protest marches against the dam since 1985.

NBA directly opposed dam construction and proposed various alternatives for development including decentralized methods of water harvesting. They demanded World Bank accountability for the displacement of millions of people. The activists also campaigned against paying taxes and denied the entry of any government official into villages. Lori Udall of the Environmental Defense Fund worked with a U.S. Congressional Committee to have an oversight hearing on Sardar Sarovar dam, where Patkar could testify against the dam in 1989. In addition to working with the Environmental Defense Fund, the NBA also worked with numerous other human rights, environmental, and solidarity organizations including the 'Narmada International Action Committee', 'Friends of the Earth', and 'Japan's Overseas Economic Cooperation Fund'.

In 1989, Baba Amte, another prominent social activist and moral leader, led a 60,000 person anti-dam NBA rally in Madhya Pradesh that faced submersion. After a year later in 1990, thousands of villagers marched to the town of Badwani, threatening to drown in the dams rising waters rather than be relocated and their slogan was 'No one will move, the dam will not be built'.

In May of 1990, NBA organized a 2,000-person, five-day sit-in at Prime Minister V. P. Singh's residence in New Delhi, and finally convinced the Prime Minister to reconsider the dam project. In December 1990, five to six thousand men and women began the Narmada People's Progress Struggle March, marching over 100 kilometers accompanied by a team of seven-members, including Medha Patkar. They were stopped by the Gujarati police and the confrontation lasted for nearly two weeks. The non-violent marchers were beaten, arrested, and dragged into trucks in which they were driven miles away.

On January 7, 1991, the seven-member team began an indefinite hunger strike. It created a pressure on Washington. As a result the World Bank announced to make an independent review of the Sardar Sarovar projects. It may have been the first time in the history of the World Bank that

efficiency and utilisation of existing dams.The long struggle in the Narmada valley has resulted finally in suspension of the work on the Sardar Sarovar dam project through the movement as well as the Supreme Court's intervention. NBA questioned and compelled the World Bank that supported the dam with a huge loan to review the Sardar Sarovar project. It also exposed the fraud in the environment compliance reports and corruption in the rehabilitation leading to a judicial inquiry. There are more than two lakhs people in the area of this single dam with the best of agriculture and horticulture and all community life going on with temples, mosques, trees, schools, buildings etc.NBA has been effective in its multiple strategies at the various executive, legislative and judicial level, campaigning against the destruction and displacement caused by large dams and for the rights of the affected people in that area.



CHECK YOUR PROGRESS

Q 8: Who led the Narmada Bachao Andolan?

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3.9 LET US SUM UP

- It is very important to create environmental awareness among people. The existence of human beings is not possible if we don't protect the environment. The movements started by different activists were conducted only to save our nature and our future.
- We discussed various movements here. All the movements had some definite objectives. The activists used various methodologies to reach the goal of protecting the environment.
- Different steps taken by the movements provide us knowledge about protecting our own nature and surrounding without violence. We can learn about different peaceful activities to save the environmental interest.
- Again, it is very important to study the impact of various activities of



3.12 MODEL QUESTIONS

A) Very Short Questions (Answer each question in about 50 words)

Q 1: When was Chipko movement started?

Q 2: What are the different objectives of Appiko movement?

Q 3: What is the full form of NBA?

Q 4: Who is Bahuguna?

Q 5: Which company established prawn factory in Chilika?

B) Short Questions (Answer each question in about 150 words)

Q 1: Name some famous environmental activists.

Q 2: What was the primary concern of Save Silent Valley Movemet?

Q 3: Mention some methodologies of NBA?

C) Long Questions (Answer each question in about 300-500 words)

Q 1: Discuss elaborately about the Chipko movement.

Q 2: Explain the methodologies of Appiko movement.

Q 3: Discuss elaborately the causes and consequences of the following movements-

(a) NBA

(b) Chilika Bachao Andolan

(c) Save Silent Valley.

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- describe how exhibitions and models can be used for teaching purpose
- discuss the role of audio visual aids for environmental education.

4.2 INTRODUCTION

In Unit 1 of this course you have studied the concepts, principles, scope and methods of teaching environmental education. You have understood that the basic objectives of teaching environmental education is not simply to study the environment but to generate the concerns for the environmental related problems. As such, the activities which can create concerns for the environment related problems should be inculcated through different forms of education. For this, we can take the help of media as channels of education to disseminate information in the classroom as well as among the common people (masses) and thereby make the educational programmes more effective and meaningful. This unit deals with different types of media that can be used effectively in the teaching learning processes of environmental education.

4.3 CONCEPT OF INSTRUCTIONAL MEDIA

The use of instructional media is an essential component in the teaching learning process. It contributes to the efficiency as well as effectiveness of the teaching learning process. Media is a supplementary devices by which the teacher, through the use of more than one sensory channel, can clarify concepts, establish and correlate accuracy, interprete and appreciate. It increases knowledge, arouses interest and enriches the imagination of children. Different media serves different functions. Media may be classified into two general categories:

(i) Print media and

(ii) Non print or modern electronic media

The print media include books, newspapers, magazines etc. Print media is the most important medium in the mass education scheme. The chief advantage of print media is that it is adaptable to many different learning

magazine serves a great purpose as educators of the masses.

A school or a college magazine is similarly an important part of the social life of the school or college. It creates a literary atmosphere and both encourages and develops writing habits among the student community. Every educational institution should have a magazine for the development of literary abilities of the students. The magazine should be properly planned and published under the supervision of teachers. A magazine can be a very effective instrument in——

- enriching the learner with news about the outside world, heritage and culture of the society he or she lives in;
- spreading messages of environmental education;
- fostering moral and spiritual values among the students;
- providing the means of proper utilisation of leisure time;
- developing national and international understanding and
- acting as the source of entertainment by exposing the children to puzzles, riddles etc., which are also helpful to develop critical thinking and reasoning power.

Thus, magazines are very important media which are read and reread and circulated or stored away for further reference.

4.5 SEMINARS

A seminar is both a method and a medium of teaching. In conventional lecture methods, the interaction flows from the teachers to the learners in an un-directional manner. But, in a seminar, each member of the group, whether he is a teacher or a student, has the scope to interact with each other. Overt verbal interaction among the members of the group is a must for all the participants in a seminar. A lecture may be good or bad depending on the skill of a teacher. Similarly, interaction sessions of a seminar also require skillful display on the part of a teacher in its organisation and conduct, if it has to achieve the objectives for which it is organised.

give independent thoughts to the content of the write ups and concretize their reactions to it, clarify the doubts, if any, consult others who have expertise and so on. This increases the quality of participation in a seminar.

4.5.2 Advantages of Seminar as a Medium of Environmental Education

Seminars are essential and suitable for developing higher cognitive abilities like application, analysis, synthesis, evaluation, problem solving and decision making. Its advantages may be summarised in the following manner:

- A general seminar provides the opportunity to assemble a good number of experts from different fields of education and various aspects of environment, and may help in finding some methods to tackle the problems.
- The students can present their thoughts clearly, concisely and logically in an academic setting which may prove very effective and can create tremendous impact on managing the environmental problems at the local or regional level.
- By participating in a seminar one can learn how to work in small groups and make the people aware about how to save the environment.
- A school seminar of students and teachers can play a very important role in influencing the young minds on how to behave responsibly to save the environment and follow healthy practices, to control pollution, to save water, to recycle waste material, to use natural resources judiciously and so on.

relationship, appraisal of existing environmental conditions etc.

Every workshop is organised to achieve certain objectives. These objectives are related to cognitive and psychomotor aspects. In the cognitive objectives attempts are made to provide knowledge on theoretical aspects. Psychomotor objectives are related to practical aspects like skill development to perform a task independently, to train persons for using different techniques, approaches etc.

4.6.1 Functions of Workshop

(i) Workshop is used to seek, explore and identify the solution of a problem, to permit extensive study of a situation, its background and social implications.

(ii) It is used for giving awareness and training of new practices and innovations in different fields.

(iii) It provides an opportunity to prepare specific professional, vocational or community service functions.

4.6.2 Procedure for Organising a Workshop

The procedure for organising workshop can be divided into two phases—pre-active and active. The steps of both the phases are as the following:

Pre-Active:

(i) Define the goals: Every workshop must have a goal. Without a clear goal, there is no point in getting people together.

(ii) Decide the target group: Decisions regarding the target group is very important because it directly relates to the objective. It is expected that workshop participants contribute actively to the workshop discussion and tasks.

(iii) Points to be discussed: A list of the main points for discussion should be prepared. These points should break down into details. Time allotment for each exercise should be fixed.

(iv) Develop a follow-up plan: The only way to find out if the workshop was a success is to have an effective follow up plan.

4.7 EXHIBITIONS

In exhibitions a group of objects and materials are displayed according to a deliberate plan. The exhibitions that are arranged in schools are usually planned to communicate something to parents, public and students.

Through exhibitions environmental issues and problems can be highlighted. It can be displayed with the help of still pictures, illustrations, charts, maps, models, diagrams, etc. A well designed exhibition may act as a motivating and vitalizing factor for actively participating in environment improvement and protection.

Exhibition should be an annual affair of the school and the idea of holding an exhibition should be planned at the beginning of the year. Teachers must guide and lead the pupils in the preparation of possible exhibits. Subject-wise arrangements of the items and effective labeling are very important.

The following points should be taken into consideration while arranging objects of exhibition –

- Too many exhibits should not be kept crowded in a room.
- The exhibits must be kept in a well-lighted place.
- It is better to put one single idea in an exhibit.
- Labels should be short and simple, easily understood.
- Explanations for the exhibits must be brief as far as possible.
- Colourful and moving exhibits attract attention of the people.

The Values of exhibition can be listed as the following (Sampath, 1987) :

(i) It is one of the effective modes of mass communication and instruction on a large scale.

(ii) Self activity is fostered on the part of those who take part in the exhibition. Special talents become known and creativity is fostered.

(iii) The outcomes of different activities and processes are very well understood by pupils.

(iv) Pupils learn the art of expression while explaining exhibits and

interest which could be utilised to the fullest advantage.

- Model preparation develops creative ability of the students. Any student constructing a model will definitely learn more than what he will learn if exposed to a similar model prepared by a teacher, because of the direct experience involved.

In environmental education, a number of projects for preparing models can be assigned to students in school situations, such as—making herbarium, making models of domestic and wild animals, mountains, course of a river etc. Thus, the teacher can sensitize the students for improving the quality of environment by preparing models of different objects which are related to environment.



CHECK YOUR PROGRESS

Q 7: What is a workshop?

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Q 8: Mention the necessary steps of a workshop in pre-active phase.

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Q 9: List the points necessary for arranging exhibits for exhibition.

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Q10: List five values of an exhibition.

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Q 11: In what way can models be effective in teaching?

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4.9 AUDIO-VISUAL AIDS

Audio-visual aids or technological media are instructional devices which can be heard as well as seen. The aim of teaching with technological

- The expert should prepare lessons in such a way that all concepts can be easily understood by the students through listening.
- Presentation of the lesson should be made attractive.
- Lessons on environmental education can be easily broadcasted in the form of questions and answers, where the subject experts and the students both come together and discuss the subject.
- A radio broadcast once recorded can be retained in the library and can be repeatedly aired whenever needed.

Merits:

- Radio is a popular media. It is less expensive as compared to other means and is available throughout the country.
- Radio helps in the development of both formal and non formal education.
- As an agency of adult education, radio is of immense importance for a nation. Through radio programmes many illiterate adults of the rural areas have been made literate.
- To spread awareness among the people, through programmes on health and hygiene, agriculture, environmental education etc., radio programmes are very helpful.
- Radio programmes can be prepared in the local languages according to local needs and background of the people.
- Radio broadcast can be listened to even while one is doing some manual work. Distance learners can listen to programmes from wherever they desire to do so.
- Radio technology is comparatively cheap. Production of programmes is simpler compared to other electronic media.
- The programmes can be repeated whenever needed.

Limitations:

- Radio broadcast is a one way communication. The educational value of radio broadcasting depends on the sense of hearing.
- As there is no face-to-face interaction between the listener and

- Television is the most potent instrument for educating the masses. India is large country with varied climatic conditions, a large and ever growing population and vast tracts of inaccessible remote locations. Television as a mass media can play a major role in the educational set up of our country.
- Television reduces dependency on teacher. The students can learn from television with their own efforts and they need minimum help from teacher.
- ETV makes educational opportunities equal throughout the country. The students in the rural and backward areas of the country can get the same quality education as their counterparts in the urban areas.
- If television is used in a large scale, it can provide education throughout the country at a minimum cost.
- Different problems of environmental education can be presented nicely through a television programme. It may also be used for developing awareness about the environment among the common people.
- Educational television can be used for the in-service training of teachers in non-school hours. NCERT is telecasting their programmes per week for the teachers to improve their skills.
- It brings live demonstration of objects, events and natural disasters like earthquake, tsunami, volcanic eruptions etc. to the classroom immediately after they occur.
- It saves time and effort as no special classroom preparation like a dark room, projection equipments etc. are necessary for telecasts.

Limitations:

- Television is essentially a one-way communication from teacher. It does not provide the facility of interaction or discussion, and hence does not provide for immediate feedback on learners' reactions, queries or doubts.
- The cost of teaching by television is more than normal

teaching purposes. These films can be background films or direct teaching films. They help to promote a skill, an attitude or to convey certain facts, information, phenomenon or theory.

Role of a teacher in using films as a media:

(i) **The teacher selects the Film:** The teacher should take care to select a film which would help him to realise his objectives. It should be integrated with other learning experiences he/she is providing. For that, he should select the best film available and must be familiar with the content of the film.

(ii) **Arrangement of the Screening:** The teacher should make proper seating arrangement, check lighting, and ventilation, and test the projector of the film, in advance.

(iii) **Preview Film:** The teacher should go through the instructional manual and guidebook, which accompany the film. He should prepare the students by providing the necessary background information and keep the student ready.

(iv) **Presenting the Film:** The film should be presented at the right moment integrating it with classroom teaching. If necessary, the screening could be stopped to just recapitulate in between. At the end of the film, a brief conclusion with the students interaction should be conducted.

(v) **Evaluation and Feedback:** There should be immediate evaluation, either oral or written feedback. The teacher should immediately correct the misconceptions or errors, if any, in the light of the information obtained from the students.



CHECK YOUR PROGRESS

Q 12: Audio-visual aids are devices which can be ——— as well as ——

Q 13: Radio has been playing a major role in the field of ————

Q 14: Radio broadcast is a ——— communication.

Q 15: State five advantages of radio broadcast.

- In exhibitions different objects are displayed according to a deliberate plan. Through exhibitions environmental issues can be highlighted. A well designed exhibition may act as a motivating factor for actively participating in the improvement and protection of the environment.
- Models are three-dimensional representation of the real thing which is very helpful to explain the structure and functions of original things. It simplifies reality and evokes greater interest. It is helpful in providing correct concepts. Model preparation develops creative ability of the students.
- Audio visual aids are instructional devices which can be heard as well as seen. It helps in completing the triangular process of learning, i.e., motivation, clarification and stimulation. Radio plays a major role in imparting instruction to school children.
- School broadcasts should be on curricular subjects based on prescribed syllabus. Radio helps in the development of both formal and non-formal education.
- Educational television presents the learning contents in various subjects. TV is the most potential instrument for educating the masses. The students in the rural and backward areas can get the same quality education as their counterpart in urban the areas.
- A film is a multiple media of communication. It presents facts in a realistic way. Educational films motivate teaching. Films are specially planned to achieve certain educational objectives.
- The teacher should take care to select a film which would help him to realise his objectives.



4.11 FURTHER READING

1) Aggarwal, J. C.(2005). *Essentials of Educational Technology: Teaching Learning*. New Delhi: Vikas Publishing House.

2) Sampath, K et al. (1987). *Introduction to Educational Technology*. New Delhi: Sterling Publishers.

Ans to Q No 11: Models simplify reality, evoke interest, provide correct concepts and model preparation develops creativity.

Ans to Q No 12: heard, seen

Ans to Q No 13: communication

Ans to Q No 14: one way

Ans to Q No 15: It is less expensive, useful for both formal and non formal education, spread awareness among the people, programmes can be prepared in the local language and it can be repeated whenever needed.

Ans to Q No 16: ETV is a system that present learning content in various subjects produced by an agency.

Ans to Q No 17: It is essentially a one way communication, the cost of teaching is more, individual differences are not taken into consideration, lessons are not flexible etc.

Ans to Q No 18: multiple



4.13 MODEL QUESTIONS

A) Very Short Questions (Answer each question in about 50 words)

Q 1: What do you mean by the term media?

Q 2: What is the importance of social media?

Q 3: Why do you think that seminar should be organized for social awareness?

Q 4: What do you mean by educational television?

Q 5: Why do you think that radio is important for educational purposes?

B) Short Questions (Answer each question in about 150 words)

Q 1: What are the advantages and limitations of educational television as a medium of mass-awareness?

Q 2: What are the procedural steps for organizing exhibition? Discuss.

Q 3: Why do you think that educational films play the dominant role for creating awareness among the masses in a society?

UNIT 5 : ENVIRONMENTAL EDUCATION PROGRAMMES FOR DIFFERENT LEVELS OF EDUCATION

UNIT STRUCTURE

5.1 Learning objectives

5.2 Introduction

5.3 Formal Environmental Education in Schools

5.4 Environmental Education for Primary Level Education

- 5.4.1 Objectives of Environmental Education at Primary Level Education
- 5.4.2 Importance of Environmental Education at Primary Level Education

5.5 Programme of Environmental Education at the Secondary School Level in India

- 5.5.1 Objectives of Environmental Education at Secondary Level
- 5.5.2 Aspects of Environmental Education Emphasised at Higher Secondary Level
- 5.5.3 How to Make Environmental Education Effective at Secondary School Level in India

5.6 Programme of Environmental Education at the Higher Educational Institutes

5.7 Let Us Sum Up

5.8 Answer to Check Your Progress

5.9 Model Questions

5.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- describe about the environmental education at formal school stages
- identify the objectives of environmental education at primary school stage
- explain the importance of environmental education at primary school

physical, biological, social and cultural aspects of environment. The environment is linked with the life support system which is itself has six components- air, land, water, flora, fauna and sun light. These components have dynamic relationship. Man being the most important organism has great responsibility to maintain this dynamic relationship among the components of life support system.

2. **Real-life situations** that link environment to life, these conditions are location specific, thus problems and priorities of each area are different.
3. **Conservation** means utilisation of natural resources not only by the present generation but also by the future generations.
4. **Sustainable development** means meeting the needs of the present keeping in view the needs of the future generations. Since all the resources are finite, so, the efforts are to be made to utilise the resources wisely and intelligently.

Environmental Education in the formal school curriculum has been influenced by two national policy documents: The National Curriculum Framework 2005 of the National Council of Educational Research and Training (NCERT) and the directive of the Supreme Court in response to a 1991 petition filed by Shri M C Mehta to make all curricula environment oriented in December 2010. The key document illuminating the way forward for EE in the formal school system, as approved by the Supreme Court, is the Affidavit filed by the NCERT and which advocates the infusion approach. This means that an environment perspective is to be added to all subjects, from Standard I to XII. The Supreme Court of India in December 2010 has conveyed its acceptance of the NCERT's Affidavit outlining the method of implementation of EE in India. On the basis of National Curriculum Framework 2005, NCERT suggests the following method of implementation of Environmental Education in schools:

Classes	Mode of Transaction
I and II	Through Activities
III and V	Environmental Studies (EVS)
VI to X	Infusion Model
XI to XII	Project based study

At primary school stage the attempt is made to sensitize the child about environment. Emphasis should be mostly (75%) on building up awareness, followed by real life situation (20%) and conservation (5%). Teaching strategy includes audio-visual and field visits.

5.4.1 Objectives of Environmental Education at Primary Level Education

The National Curriculum Framework 2005 indicates the following objectives of teaching environmental education at primary level of education:

- To train children to locate and comprehend relationships between the natural, social and cultural environment;
- To develop an understanding based on observation and illustration, drawn from live experiences and physical, biological, social and cultural aspects of life rather than abstractions;
- To create cognitive capacity and resourcefulness to make the child curious about social phenomena, starting with the family and moving on to wider spaces;
- To nurture the curiosity and creativity of the child particularly in relation to the natural environment (including artifacts and people);
- To develop an awareness about environmental issues;
- To engage the child in exploratory and hands-on activities to acquire basic cognitive and psychomotor skills through observation, classification, inference, etc.
- To emphasise design and fabrication, estimation and measurement as prelude to the development of technological and quantitative skills at later stages; and
- To be able to critically address gender concerns and issues of marginalisation and oppression with values of equality and justice, and respect for human dignity and rights.

5.4.2 Importance of Environmental Education at

their life style influences the environment.



CHECK YOUR PROGRESS

Q 1: What percentage should be emphasised on building up awareness among children towards environment at primary level of education?

Q 2: Write two objectives of Environmental Education at Primary Level.

Q 3: Why is it important to teach environmental education at primary level?

Q 4: The spectrum of Environmental Education has four major interrelated components, i.e., ..., ..., ... and ..... (Fill in the blanks)

5.5 PROGRAMME OF ENVIRONMENTAL EDUCATION AT THE SECONDARY SCHOOL LEVEL IN INDIA

Secondary stage or level of education is an important stage for all students because in this stage students get the chance to acquire knowledge to make themselves better and responsible citizens. The future make-up of the young generation of society is known in this stage or level of education. This level of education is the bridge between the primary and higher education. Therefore, in this level all important issues relating to environment may be included in the curriculum. From the lower secondary school stage onwards, there should be increased knowledge of real-life situations, conservation and sustainable development. At lower secondary level, objective of environmental education must be real-life experience, awareness and problem identification. The contents to be used are those used at Primary School level supplemented with general science. Teaching, practical and field visit are to be organised.

At the higher secondary school stage emphasis must be conservation, assimilation of knowledge, problems identification and action skills. The content used may be science-based and action oriented work.

5.5.3 How to Make Environmental Education Effective at Secondary School Level In India

In order to make environmental education relevant and effective at secondary school level, the following steps need to be taken in incorporating environmental contents in the syllabus:

1. ***Reduce the number of concepts to be learnt:*** Let there be for every unit not more than 3 concepts to be learnt. This means that we consciously ensure the learning of these concepts and evaluate the extent of learning; at the same time not shutting the door to students who may want to learn more. If the methodology is interesting a child will learn beyond our expectation.
2. ***Make a clear distinction between concepts and facts that need to be learnt:*** Often these two are used in a mixed manner under the heading 'concepts'. By adding details which is pounce upon by textbook writers, may make teaching a difficult job for teachers.
3. ***Avoid repetition of topics and concepts:*** Class VI and VII Environmental Education syllabus has similar concepts on air, water and soil that continue to dominate at various other levels too. Similarly class VIII & IX have an overdose of ecosystems which start as forests etc in classes VII & VIII. These are topics that are also learnt in science and geography and taken together would rapidly lead to boredom for students.
4. ***Change the format of the presentation and details of the curriculum and make it more explicit in what is expected as; learning outcomes:*** Rather than suggesting activities, suggest clearly the learning outcomes. A list of vocabulary, skills that need to be mastered at each level is what the curriculum should have. The activities, examples should be left to the teacher to decide based on what is available in the students' environment.

Q 8: Write any two steps to make Environmental Education effective at Secondary School Level In India.

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5.6 PROGRAMME OF ENVIRONMENTAL EDUCATION AT THE HIGHER EDUCATIONAL INSTITUTES

Higher Educational institutes are involved in the promotion of information and in creating social attitudes that influence the normal life. Higher education includes universities and colleges, research and training centres, novel groups, employers, student organisations, quality, declaration organisations, governmental and executive organisations. These institutes connect the regions; go beyond disciplinary limits and with local and international scope of progress. They are vital in producing leaders and in creating history. Supreme Court is its judgement has made learning of the subject of environmental issues mandatory at the undergraduate level (1991). University Grants Commission has directed all affiliated institutions to compulsorily teach the subject for all the branches of engineering (2004). The Hon'ble Supreme Court directed the UGC to commence a foundation course at each stage of college education on environment. Consequently, UGC has implemented a six months compulsory course in environmental studies and made it mandatory in all the university colleges of India. UGC appointed an experts committee to look into the relevant questions and issues. Later a core module syllabus for environmental studies for undergraduate courses was prepared for all the branches of higher education. Higher Education Programmes over the years have made significant efforts to broaden the scope of environmental education to college students so that they can become responsible citizens, teachers, policy-makers and influential group.

At the global level Talloires Declaration in 1990 invited twenty-two university leaders in Talloires, France, to vent out their distress about the prevailing environmental conditions and the role of universities in creating

partnership between tertiary educational institutions of environmental security and organisation. Higher educational institutions should put efforts on promotion.



CHECK YOUR PROGRESS

Q 9: Talloires Declaration was made in .....

(Fill in the blanks).

Q 10: Who has directed to introduce environmental studies compulsorily in all the branches of engineering courses?

.....

.....

Q 11: Write any one programme offered by several universities on postgraduate education on environment.

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5.7 LET US SUM UP

- Environmental education programmes are essential to engage the people sustainability through education and lifelong learning. It is meant to ensure that people have the information and skills to lead an ecologically balanced life and a sustainable community.
- Considering the relevance of Environmental Education, as per National Curriculum Framework 2005 the new syllabi being proposed aim at generating among young learners an awareness of and sensitivity to the total environment in a holistic manner and the problems associated with it. It would also equip the future custodians of the earth with the requisite knowledge of the total environment, natural and social, the problems associated with it and the necessary skills for solving these in a positive and sustainable manner.

incorporating environmental courses in the General Education curriculum of higher education and preparing compendium of lessons on environment for higher education.



5.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: At primary school stage the attempt should be made to build awareness among the child about environment and in this regard, emphasis should be given seventy five percent out of the total activities of environmental education.

Ans to Q No 2: Two objectives of Environmental Education at the primary level are as follows:

a) To train children to locate and comprehend relationships between the natural, social and cultural environment;

b) To develop an understanding based on observation and illustration, drawn from lived experiences and physical, biological, social and cultural aspects of life rather than abstractions;

Ans to Q No 3: The primary education offers huge possibilities to find solution to environmental problems, as kids/children are very inquisitive for surrounding, they live in and if educated properly they will respect nature and behave in way that is appropriate from the viewpoint of protecting and improving the environment.

Ans to Q No 4: The spectrum of Environmental Education has four major interrelated components, i.e., awareness, real life situation, conservation and sustainable development.

Ans to Q No 5: At the higher secondary school stage emphasis must be conservation, assimilation of knowledge, problems identification and action skills. The content used may be science-based and action oriented work. There should be proper teaching, practical and field work.

Ans to Q No 6: The two objectives of Environmental Education at the secondary level are as follows:

Q 4: Where was the Talloires Declaration held?

B) Short Questions (Answer each questions in about 150 words)

Q 1: Write four objectives of Environmental Education Programme at primary level.

Q 2: Why is Environmental Education needed at Primary Level?

Q 3: Write the methods suggested by NCERT regarding implementation of Environmental Education at different classes of school education.

Q 4: Write four aspects of Environmental Education emphasised at Higher Secondary Level.

Q 5: What role does UGC play in introducing environmental education at higher education institutes?

C) Long Questions (Answer each questions in about 300-500 words)

Q 1: Discuss about the formal Environmental Education Programmes at School Level.

Q 2: How Environmental Education at Primary level can be implemented.

Q 3: Discuss how Environmental Education can be made effective at Secondary School level in India.

Q 4: Discuss about the programme of Environmental Education at the Higher Educational Institutes.

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environmental degradation. Today, every aspect of our environment is endangered. The air we breathe, the water we drink and the land on which we grow our food all have been exposed to pollution causing large scale environmental degradation. To over-come the resultant environmental crisis the world is coming together to use technology and resources to repair the damage already done to our environment and also to propagate the use of substitutes in place of certain harmful chemicals so that we can protect and preserve our environment.

6.3 CONCEPT OF ENVIRONMENTAL DEGRADATION

Environmental degradation is a wider and comprehensive term which refers to the lowering and the deterioration of the quality of the environment caused by both natural processes and human activities at local, regional and global perspectives. Environmental pollution is a component of the degradation that means an over-all lowering of the environmental qualities because of the adverse changes brought about by human activities. Environmental degradation is further complicated by rapid increase in population. The quick growth of urban population in the industrially developed cities has resulted in the pollution of air, water, and sound. It has now created a situation where air is unfit for breathing, water is unfit for drinking, and the soil is unfit for cultivation.

Thus, the present population explosion and industrial growth along with pollution have combined to cause large scale environmental degradation in the form of pollution of the natural resources. This pollution is largely a man made problem particularly in the developing countries of the world. Degradation of environment may result from human activities as well as natural disasters.



LET US KNOW

Environmental pollution and environmental degradation are used interchangeably by most people but in reality

harmful effects on various forms of life or property. The main types of pollution are - air- pollution, water-pollution, soil pollution etc.

6.3.2 Causes of Environmental Degradation

We know that environmental and ecological changes are the result of the changes brought about by science and technology in human life. With the advent of socio-economic, scientific and technological development there has been the serious problem of environmental degradation. In general, the causes of environmental degradation may be divided into two- physical or natural and human actions.

Physical or Natural: Environmental degradation is caused by certain natural phenomena. Some of these are as follows:

- **Soil Erosion:** The loss of soil or disturbance of the soil structure is called soil erosion. Soil erosion causes uprooting of plants resulting in deforestation, loss of pastures, expansion of deserts and increase in the frequency of droughts and floods. It also causes soil creep, earth flow, mudflow, landslides etc.
- **Earthquakes:** Earthquakes are tremors which are produced by the passage of vibratory waves through the rocks. The devastations caused by earthquakes to the life of man and property as well as to the ecosystem is very high. Earthquakes also lead to landslides, change in the course of rivers, loss of plants and animal life, destruction of dams and development of faults and fractures on earth's surface.
- **Volcanoes:** A volcanic explosion is an environmental hazard of the severest type, causing heavy loss to plant and animal life. It can also cause major hazards to people who live near them. Large plumes of ash and gas ejected high into the atmosphere can influence climate, sometimes on a global scale.
- **Floods, droughts and famines:** Floods and droughts are

Environmental Degradation due to human actions: Man has created an imbalance in the environment by exploiting it haphazardly to fulfill his needs. Thus, some of the important human factors which lead to environmental degradation are as follows:

- **Overpopulation:** The root cause for the change in the environment is the explosion of human population. Phenomenal increase in human population and the consequent increase in the use of fossil fuel and deforestation have resulted in the increase in green house gases such as carbon dioxide. Growing population has also adverse effects on human health and quality of life.
- **Industrialization:** Industrialization has led to rapid deforestation, unorganised mining, pollution etc. It has created disturbance in the eco-sensitive areas like ozone layer, tropical forests, and led to the extinction of several species of wildlife birds and plants. Industrialization produces a variety of pollutants such as gases, smoke, oil, plastic metallic waste, and acids etc which degrade the environment.
- **Urbanization:** Industrialization leads to the mushrooming of cities all over the world. Industries are mainly centralised in the urban areas and the attraction of job opportunities encourage migration of the rural population to the cities. It results in the growth of slums in the urban areas and highly productive agricultural land is encroached by urban houses, roads and industries. On the environment side, urban centers concentrate on much of the world's pollution and green house gas emissions. Thus, unplanned urbanization leads to degradation of human health and the quality of the environment, contributing to social, ecological and economic instability in many countries of the world.
- **Deforestation:** Deforestation has brought about environmental

practice by the car owners.

- Using low sulphur coal in industries.
- Use of organic manure instead of commercial fertilizer.
- Using non-conventional sources of energy.
- Planting of more trees, consumption of electricity should be reduced.

Water Pollution: Controlling water pollution is what some easier than controlling air pollution. Water pollution can be prevented and controlled by adopting several remedial measures. They may be mentioned below -

- Proper drainage system should be provided for separate flow of sewage water and rain water.
- Water control act may be adopted by the concerned authority.
- Agro-chemicals like pesticides and fertilizers should be reasonably and judiciously used in agriculture.
- Use of fertilizer in agriculture may be supplemented by nitrogen fixing plants.
- Polluted water may also be purified by using solar power.
- Pollutants present in water may be removed by using the method of water purification.

Soil Pollution: Survival and growth of the living organisms basically depend upon the equality of the land and soil. To check soil pollution and to improve the quality of soil the following steps may be taken -

- Farmers should be trained in the appropriate use of the fertilizer chemicals.
- Bio-gas may be produced from the organic waste products.
- Soil erosion by irresponsible cutting of hilly areas should be stopped by making laws.
- Use of DDT as insecticides should be restricted.
- Industrial water products and garbages of the urban areas should be properly disposed.

Noise Pollution: Noise or sound created in the environment may also be a state of pollution that causes physical and psychological

- Atomic energy should be used for peace and economic progress rather than for war and destruction.
- Waste products of the laboratory that contain radio-active elements should be properly disposed.
- Site of the nuclear power plans should be carefully selected.
- Awareness should be created on the global level with regard to these nuclear pollution and its possible danger.

Environmental degradation due to physical or natural factors: There are some physical or natural causes of environmental degradation such as earthquakes, floods etc. Earthquake is a natural hazard which causes great loss to life and property. Damage to life and property can be prevented by constructing earthquake resistant buildings in the earth quake prone-zones. Assam type houses are preferable in Assam as the state is located in the seismic Zone.

It is difficult to prevent and control landslides. The first step to prevent landslides is to stop deforestation. It can be minimised by stabilising the slope by draining the surface and sub-surface water and by providing slope support like wired stone blocks.

One can not entirely get rid of floods as it is a natural phenomenon. But, the impact of floods can be minimized by means of technological skill, better warning systems and various control measures adopted by the Governments.

Human action: The rapid rate of population growth, industrial expansion unplanned urbanization, agricultural development, deforestation etc. are continuously accelerating the frequency and magnitude of natural hazards and disasters. The quality of the environment should be maintained through environmental planning, people's participation, environmental status evaluation and environmental legislation and administration. Some atmospheric hazards are caused by human activities such as dams, deforestation etc. To avoid these atmosphere hazards, alternatives plans and projects may be introduced.

The Educational Management Plan tries to maintain the quality

garden.

- Population growth should be checked to prevent the environmental degradation.
- The quality of the environment should be maintained through environmental planning, people's participation, environmental status, and environmental legislation and administration.



CHECK YOUR PROGRESS

Q 3. Mention the different types of environmental degradation.

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Q 4. Mention briefly the cause of environmental degradation.

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Q 5. Mention any four ways of controlling air pollution.

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Q 6. What measures can be taken to prevent soil pollution?

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ACTIVITY 6.1

"Over population and environmental degradation are inter-related" -Explain.

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6.3.4 Role of Education for Environmental Awareness and Attitude Change

Education can be used as the powerful instrument of social change, social control and development in the modern society. The

study circle etc. should be organized on the local, regional, national and even international level.

Education is a potent medium through which human beings can express their fullest potential. It is of critical importance for changing the attitude and behaviour towards sustainability and responsibility. Both formal and informal education is necessary for empowering people so that they bear their responsibility towards environment and to address their concerns about sustainable development. It is also crucial for developing environmental awareness, attitudes and values, skills and behaviour required for sustainable development and for participating in and influencing the decision making process.

LET US KNOW



- Education in all its form is essential for fostering responsible environmental awareness amongst the people. Some measures can be adopted through education for providing awareness and developing the right type of attitudes and values towards the environment-

  - Environmental education is to be introduced in all educational institutions.
  - Interdisciplinary approach is needed.
  - Environmental issues may be incorporated with almost all branches of knowledge.
  - Population Education should be introduced.
  - Mass awareness programme should be taken up.



6.5 FURTHER READING

1) Mohapatra, Damodar : Environmental Education, Kalyani Publishers, New Delhi - 2002.

2) Reddy K.P. &Reddy D.N. :Environmental Education, Neelkamal Publication Pvt. Ltd. Hyderabad(2003)

3) Sharma, R.A : Environmental Education, R. Lall Book depot Meerut(2005)



6.6 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: Environmental degradation means the overall lowering of the environmental qualities on account of the adverse changes brought in by human activities in the basic components of the environmental to such an extent that these changes adversely affect all biological communities in general and human society in particular.

Ans to Q No 2: Environmental pollution means the lowering of the quality of the environment at the local level by human activities. On the other hand, environmental degradation means deteriorating the quality of environmental at the global, regional and local level by natural processes and human activities.

Ans to Q No 3: Environmental degradation is divided into two main categories such as - Hazards and events, environmental pollution.

Ans to Q No 4: Environmental degradation is caused by certain natural phenomena like - Soil Erosion, Earthquakes, Volcanoes, Flood, droughts and famines etc. Environmental degradation takes place due to many human activities like - Over population, Industrialization, Urbanization, Deforestation, Mining activities, Use of pesticides etc.

Ans to Q No 5: The four ways by which air pollution can be minimized are:

- Vehicular pollution being common in the towns and cities,

Q 4: How can we maintain the quality of environment?

B) Short Questions (Answer each question in about 150 words)

Q 1: What are the types of Environmental Degradation? Discuss each type briefly.

Q 2: How environmental education is different from environmental pollution?

Q 3: Suggest the ways and means to prevent water pollution.

Q 4: Mention the different steps to improve the quality of soil.

Q 5: Mention the role of education in the prevention of environmental degradation.

C) Long Questions (Answer each question in about 300-500 words)

Q 1: What steps should be taken for the prevention of degradation? Discuss.

Q 2: Discuss the various causes of environmental degradation.

Q 3: What should be the role of education for creating environmental awareness among the masses? Discuss.

*** ***** ***

meaning and different types of environmental pollution. Again, here we shall discuss the causes, types, and adverse effects of different types of environmental pollution. Further, we shall discuss how to prevent or control various environmental pollution discussed.

7.3 MEANING OF ENVIRONMENTAL POLLUTION

Man's attempt to conquer nature has upset the natural relationship between man and his environment. Man's reckless and indiscriminate exploitation of nature has disturbed the ecological balance between living and non-living components of the environment. By his reckless acts, man is not only threatening his own survival on this planet, but also the survival of other living organisms. It is needless to mention here that for normal and healthy living a conducive environment is required by all living beings, including humans, livestock, plants, micro-organisms and the wildlife. The favourable unpolluted environment has a specific composition. When this composition gets changed by addition of harmful substances, the environment is called polluted environment and the substances polluting it are called pollutants. Therefore, environmental pollution can be defined as any undesirable change in the physical, chemical or biological characteristics of any component of the environment (air, water, soil) which can cause harmful effects on various forms of life or property. According to the Environment (Protection Act), 1986 also "environment pollution" means the presence in the environment of any environmental pollutant.

Though environmental pollution is not a modern phenomenon but present environmental pollution is caused mostly by human activities. It is commonly agreed that pollution is, without doubt, the outcome of urban industrial technological revolution and rapacious and speedy exploitation of natural resources, increased rate of exchange of matter and energy and ever increasing industrial wastes, urban effluents and consumer goods.
The problem of environmental pollution is global and concerns all countries irrespective of their size, level of development or ideology. For example, if the nuclear test is carried out in one part of the world the fall out may be carried by winds to any other part of the world and such fall out of

effects on man and his environment. These substances include gases, particulate matter, radioactive substances etc.

Sources of Air Pollution:

There are two main sources of air pollution as follows:

- Natural Sources: These include volcanic eruptions, deflation of sands and dust, sea salt sprays, biological decay, wild or forest fires in natural vegetation etc.
- Man-made Sources: Man-made sources include thermal power plants, industrial units, vehicular emissions, fossil fuel burning, agricultural activities etc.

Apart from these, a variety of pollutants are released into the air from different sources. Some of them are as follows:

- Carbon Compounds: These are mainly carbon dioxide and carbon monoxide, the former released by complete combustion of fossil fuels and the latter by automobile exhausts.
- Sulphur Compounds: These include SO2, H2S and sulphuric acid, mostly released by fossil fuel (coal etc.), based power generating plants (Thermal plants) and industrial units (refineries).
- Nitrogen Oxides: These include chiefly nitrogen monoxide, nitrogen oxide, nitric acid and mostly released by automobiles, power plant and industries.
- Ozone: Its level may rise in atmosphere due to human activities.
- Fluorocarbons: These come from industries, insecticides spray etc.
- Hydrocarbons: These are chiefly benzene, benzpyrence, etc which are mostly discharged by automobiles and industries.
- Metals: These include chiefly lead, nickel, arsenic, beryllium, tin, vanadium, titanium, cadmium etc. present in air as solid particles or liquid droplets or gases. They are produced mostly by metallurgical processes, automobiles, seaspray etc.

Types of Air Pollution:

Regarding classification, air pollution is divided on two bases.

- It causes obstruction to vision of pilots and has caused air craft accidents.

Prevention and Control of Air Pollution:

Air pollution can be minimised by following methods:

- Using mass transport system, bicycles etc.
- Vehicular pollution can be checked by taking steps like regular tune-up of engines, replacement of more polluting old vehicles and installing catalytic converters etc.
- Shifting to less polluting fuels like hydrogen gas.
- Using non-conventional sources of energy like solar, wind etc.
- Using biological filter and bio-scrubbers.
- Siting of industries after proper Environmental Impact Assessment studies.
- Using low sulphur coal in industries.

7.4.2 Water Pollution

Water pollution can be defined as alteration in physical, chemical or biological characteristics of water making it unsuitable for designated use in its natural state.

Sources of Water Pollution:

There are two main sources of water pollution. These are as follows:

- Natural sources: Water pollutants include soil erosion, volcanic eruption, landslides, coastal and cliff erosion, floods, decomposition of plants and animals etc.
- Man-induced Sources: Water pollutants include industries, power plants, underground coal mines, urbanisation, and surface run-off from agricultural fields, cultural activites (religious fairs and pilgrimage) etc.

The main source of surface water pollution are-

- Sewage and other wastes generated in the cities and towns.
- Effluents and wastes generated by industries, especially chemical industries.

- The discharge of nitrogen, phosphorus and other nutrients coming from various man-made sources stimulates the algae growth in these run offs and coastal zones to dangerous levels. This excess in algae is harmful to the local habitat and uses all the oxygen, killing off the native aquatic life. Nutrient pollution can also cause unusual outbreaks in fish diseases.
- Exposure to oil or its chemicals can alter the ecology of aquatic habitats and the physiology of marine organisms. Evidence strongly suggests that components of crude oil persist in the marine environment for years and are extremely toxic to the aquatic life.
- Pesticides are carried into water systems by rain water runoff and are sometimes even sprayed directly into waterways as part of pest-control. Pesticides are used for protecting the farmer's crops. When enough of these pesticides get carried into the water, they can have serious effects on our health as well.
- Dangerous chemicals used in mining processes are carried into rivers and lakes and have devastating effects on the water. When rain or surface water flows over exposed rock and soil, it can combine with naturally occurring sulphur to create sulphuric acid.
- Industry machinery is cooled by water from lakes and rivers. This water then returns to the water sources in a heated state. Fish and other organisms that have adapted to a particular temperature can be killed from thermal shock, and the extra heat can disrupt the spawning. Warmer water temperatures also reduce the oxygen content in the water, which increases the organism's susceptibility to disease, parasites, and the effects of toxic chemicals.
- Excess of fluoride in drinking water causes defects in teeth and bones called fluorosis.

Prevention and Control of Water Pollution:

tremendously since technology provided us with modern pesticides and fertilizers. They are full of chemicals that are not produced in nature and cannot be broken down by it. As a result, they seep into the ground after they mix with water and slowly reduce the fertility of the soil.

- **Waste Disposal:** Every human produces a certain amount of personal waste products by way or urine and faeces. While much of it moves into the sewer the system, there is also a large amount that is dumped directly into landfills in the form of diapers. Even the sewer system ends at the landfill, where the biological waste pollutes the soil and water. This is because our bodies are full of toxins and chemicals which are now seeping into the land and causing pollution of soil.
- **Accidental Oil Spills:** Oil leaks can happen during storage and transport of chemicals. This can be seen at most of the fuel stations. The chemicals present in the fuel deteriorate the quality of soil and make them unsuitable for cultivation.
- **Acid Rain:** Acid rain is caused when pollutants present in the air mixes up with the rain and fall back on the ground. The polluted water could dissolve away some of the important nutrients found in soil and change the structure of the soil.

Effects of Soil Pollution:

- Considering how soil is the reason we are able to sustain ourselves, the contamination of it has major consequences on our health. Crops and plants grown on polluted soil absorb much of the pollution and then pass these on to us. This could explain the sudden surge in small and long term illnesses.
- The ecological balance of any system gets affected due to the widespread contamination of the soil. Most plants are unable to adapt when the chemistry of the soil changes so radically in a short period of time. Fungi and bacteria found in the soil that bind it together begin to decline, which creates an additional problem of soil erosion.

7.4.4 Solid Waste Pollution

All solid and semi-solid wastes arising from human and animal activities and are discarded as useless or unwanted are included in the term 'solid wastes'. Solid waste is often called the third pollution after air and water pollution. It includes garbage, rubbish, ashes and residues, demolition and construction wastes, dead animals, radioactive wastes. The amount of solid waste produced in urban India is steadily and rapidly increasing.

Source of Solid Wastes:

Different sources of solid wastes pollution are:

- **Domestic Wastes:** Waste that arises from household activities of human beings includes garbage, rubbish and Ashes.
- **Industrial Wastes:** Wastes which arises from industrial activities includes construction and demolition wastes, discarded equipment and tools, mining wastes etc.
- **Agricultural Wastes:** These include agricultural residues and poultry and diary wastes. Further, agricultural wastes may also include packing and cans of fertilizers, pesticides and soil conditioners used in modern agricultural practices.
- **Commercial Wastes:** Wastes those arise from public places such as offices, markets, restaurants, streets etc. includes building wastes, garbage, hazardous waste, ashes and rubbish.

Types of Solid Wastes:

Different types of solid wastes are:

- **Biodegradable Wastes:** Wastes which can be broken down into simpler and harmless substances by nature in due course of time using biological means.
- **Non-Biodegradable Wastes:** Wastes that cannot be broke down into simpler and harmless substances by biological means. For example- plastics, polythene bags, glass objects etc.

7.4.5 Noise Pollution

Noise pollution is an excessive or annoying degree of noise in a particular area. High level noise is a disturbance to the human environment. Because of urbanization, noise in all areas in a city has increased considerably.

Sources of Noise Pollution:

Different sources of noise pollution are as follows:

- **Household Sources:** Food Mixer, Grinder, Vacuum Cleaner, Washing machine and Dryer, Air Conditioner, Straightners and curlers, Cooler, TV, iPods and Earphones, Loud speaker, Neighbour's Barking Dog.
- **Social Events:** Places of Worship, Discos and Gigs, Parties, Markets where people sell goods with, loudspeaker. When these events are not often, they can be termed as nuisance rather than noise pollution.
- **Commercial and Industrial Activities:** Printing Presses, Manufacturing Industries and Construction Sites.
- **Transportation:** Road Traffic Noise, Aircraft Noise, Noise from Rail Roads.

Causes of Noise Pollution

Different causes of noise pollution are:

- Poor Urban Planning
- Sounds from Motor Vehicles
- Sounds from Musical Instruments
- Car Alarms
- Office Equipment
- Factory Machinery
- Construction Work
- Barking Animals
- Appliances
- Audio Instruments
- Loud Speakers

blowing should be restricted especially in vehicle-congested areas.

- **Tree Plantation:** Planting more trees having board leaves.

7.4.6 Radio-active Pollution

Radioactive pollution, like any other kind of pollution, is the release of something unwanted into the environment and, in this case, the unwanted thing is radioactive materials. It is also called radiological contamination.

Causes of Radioactive Pollution:

There are many causes of radioactive pollution, such as:

- **Production of nuclear weapons:** Radioactive materials used in this production have high health risks and release a small amount of pollution.
- **Decommissioning of Nuclear Weapons:** The decommissioning of nuclear weapons causes slightly more radioactive pollution than in the production, however, the waste (alpha particles) is still of low risk and not dangerous unless ingested.
- **Mining of radioactive ore:** Mining involves crushing and processing of the radioactive ores and this generates radioactive waste which emits alpha particles.
- **Coal ash:** It may come as a surprise that coal ash can be very dangerous. Some coal contains more radioactive material than usual and is often referred to as 'dirty' coal; when this is burnt the ash becomes more radioactive as the radioactive particles do not burn well.
- **Medical waste:** A number of radioactive isotopes are used in medicine, either for treatment or diagnostics. These can be left to decay over a short period after which they are able to be disposed of as normal waste.
- **Nuclear power plants:** Nuclear power plants under current standards produce little radioactive pollution due to safety precautions that must be adhered to.

Q 6: How to control radioactive pollution?

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7.5 LET US SUM UP

In this unit we have discussed the following matters:

- Pollution is the process of making air, water, soil contaminated or dangerously dirty and not suitable for people to use.
- The classification of Environmental Pollution is a difficult task because the pollutants and the media through which the pollutants are transported are all interconnected and inter-related.
- In simple terms air pollution can be defined as any ambient condition in which substances are present at concentrations high enough above their normal levels to produce measurable effect.
- Water gets polluted by the contamination, of water bodies such as lakes, rivers, oceans, and groundwater, caused by human activities, which can be harmful to organisms and plants which live in these water bodies.
- Soil pollution, which can also be called soil contamination, is a result of acid rain, polluted water, fertilizers, deforestation, dumping of solid wastes etc., which leads to bad crops.
- All solid and semi-solid wastes arising from human and animal activities and are discarded as useless or unwanted are included in the term 'solid wastes'. Solid waste is often called the third pollution after air and water pollution.
- Noise pollution is an excessive or annoying degree of noise in a particular area. High level noise is a disturbance to the human environment.
- Radioactive pollution, like any other kind of pollution, is the release of something unwanted into the environment and, in this case, the unwanted thing is radioactive material.

- Particulate air pollution.

Again on the basis of types of sources of pollutants, air pollution can be further subdivided into four types such as-

- Automobile air pollution
- Industrial air pollution
- Thermal power plants pollution
- Nuclear pollution.

Ans to Q No 4: Two causes of soil pollution are:

- **Industrial Activity:** Most industries are dependent on extracting minerals from the Earth. As a result, the industrial waste lingers in the soil surface for a long time and makes it unsuitable for use.
- **Acid Rain:** Acid rain is caused when pollutants present in the air mixes up with the rain and fall back on the ground. The polluted water could dissolve away some of the important nutrients found in soil and change the structure of the soil.

Ans to Q No 5: Different sources of solid wastes pollution are:

- **Domestic Wastes:** Waste that arises from household activities of human beings includes garbage, rubbish and Ashes.
- **Industrial Wastes:** Wastes which arises from industrial activities includes construction and demolition wastes, discarded equipment and tools, mining wastes etc.
- **Agricultural Wastes:** These include agricultural residues and poultry and dairy wastes. Further, agricultural wastes may also include packing and cans of fertilizers, pesticides and soil conditioners used in modern agricultural practices.
- **Commercial Wastes:** Wastes those arise from public places such as offices, markets, restaurants, streets etc. includes building wastes, garbage, hazardous waste, ashes and rubbish.

Ans to Q No 6: Radioactive pollution may be controlled in the following ways:

- Care should be taken to check manmade radiation pollution at source.
- Nuclear reactor should be preferably maintained to avoid

UNIT 8 : CONSERVATION AND PROTECTION OF ENVIRONMENT

UNIT STRUCTURE

8.1 Learning Objectives

8.2 Introduction

8.3 Concept of Conservation and Protection of Environment

- 8.3.1 Legal and Constitutional Provisions for Conservation and Protection of Environment
- 8.3.2 Role of the Individual and Society towards Environmental conservation and protection

8.4 Let Us Sum Up

8.5 Further Reading

8.6 Answer to Check Your Progress

8.7 Model Questions

8.1 LEARNING OBJECTIVES

After going through this unit you will be able to:

- define the concept of conservation and protection of environment
- discuss the role of individual and society towards environmental conservation and protection and the legal and constitutional safeguards for environmental protection.

8.2 INTRODUCTION

Nature is the mother of all creatures on earth. The gradual growth of world population and over exploitation of natural resources without realising the future consequences has led to severe degradation of the environment. Man must realize that biological diversity is a 'gift of nature' to be nurtured and enjoyed and not to be destroyed. Man must learn to make rational adjustment with nature involving judicious exploitation and utilization of natural resources without disturbing the ecological balance and eco-system equilibrium. Therefore it is the need of the hour to take measures to conserve

natural resources of any area constitutes its basic capital and wasteful use of those resources constitute an economic loss. From the aesthetic and moral view point, conservation also includes the maintenance of nationalparks and wild life sanctuary. In certain cases, conservation may imply the protection of a natural environment from any human economic activity.

The term 'Protection' implies that man should remain responsible and take the initiative to put a stop to senseless destruction and degradation of the natural resources. Man should exhibit the sense of sanity not to indulge in the negative and destructive role towards nature. Although in broad sense 'Conservation and Protection' may be said as the relative terms. Conservation of nature may be possible through protection of nature by man. Man may apply new knowledge and skills, science and technology to conserve and preserve, protect and develop the natural resources for their own benefit. This new realization may be made possible through environmental education.

8.3.1 Legal and Constitutional Provisions for Conservation and Protection of Environment.

In this section, after going through the concept of conservation and protection of environment, we are going to discuss the various legal and constitutional provisions for conservation and protection of environment. You will get a clear idea about these provisions from the following description.

India has been the first country to make constitutional provisions for the protection and conservation of the environment. In 1976, within four years of Stockholm Conference, India made constitutional provisions for environmental protection through the 42nd amendment.

Article 48-A of the Constitution provides: "The State shall endeavour to protect and improve the environment and to safeguard forests and wildlife of the country".

Article 51-A (G) provides: "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lakes,

Employment of Women and Children near cotton openers etc.

The Insecticides Act 1968

As the uses of pesticides are injurious to health of human beings and the environment as a whole, the Government of India enacted the Insecticide Act in 1968. This was enforced from 1971 to regulate import, manufacture, sale, transport, distribution and the use of insecticides with a view to preventing risk to human beings and animals. Several agencies such as the Central Insecticide Board, the pesticides registration committee, the pesticides environment pollution advisory committee, the central insecticide laboratory, the committee to ban/ restrict the use of pesticides, were created for effective enforcement of this act.

The Wildlife (Protection) Act, 1972

The Wildlife (Protection) Act, which was formulated and came into existence, is a landmark in the history of wildlife legislation. Wildlife was transferred from state list to concurrent list in 1976, thus giving power to the Central Government to enact the legislation. The Indian Board of Wild Life (IBWL) was created in 1952 in our country, which after the enactment of the Wildlife (Protection) Act actively took up the task of setting up Wildlife National Parks and Sanctuaries. The major activities and provisions incorporated in the act are as follows:

- It defines the wildlife related terminology.
- It provides for the appointment of wildlife advisory board, wildlife advisory board, wildlife warden, their powers, duties etc.
- Under the Act, comprehensive listing of endangered wildlife species was done for the first time and prohibition of hunting of endangered species was mentioned.
- Protection of some endangered plants like Beddome Cycad, Blue Vanda, Lady's Slipper Orchid, Pitcher Plant etc is also provided under the Act.
- The Act provides for setting up of National Parks, Wildlife Sanctuaries etc.
- The Act provides for the constitution of Central Zoo Authority.

and control of water pollution.

- It co-ordinates the activities of State Pollution Control Boards and provides them technical assistance and guidance.
- It organizes training programs for prevention and control of pollution.
- It organizes comprehensive programs on pollution related issues through mass media.
- It collects, compiles and publishes technical and statistical data related to pollution.
- It prepares manuals for treatment and disposal of sewage and trade effluents.
- It lays down standards for water quality parameters.
- It plans nationwide programs for prevention, control or abatement of pollution.
- It establishes and recognizes laboratories for analysis of water, sewage or trade effluent sample.

The State Pollution Control Boards also have similar functions to be executed at state level and are governed by the directions of CPCB.

- The Board advises the State Government with respect to the location of any industry that might pollute a stream or a well.
- It lays down standards for effluents and is empowered to take samples from any stream, well or trade effluent or sewage passing through an industry.
- The State board is empowered to take legal samples of trade effluent in accordance with the procedure laid down in the act. The sample taken in the presence of the occupier or his agent is divided into two parts, sealed, signed by both parties and sent for analysis to some recognized laboratory. If the sample do not conform to the prescribed water quality standards (crossing maximum permissible limits), then 'consent' is refused to the unit.
- Every industry has to obtain consent from the Board (granted for a fixed duration) by applying on a prescribed proforma providing

or environment.

- Noise pollution has been inserted as pollution in the Act in 1987.
- Pollution control boards at the central or state or state level have the regulatory authority to implement the Air Act. Just parallel to the functions related to improvement of air quality. The boards have to check whether or not the industry strictly follows the norms or standards laid down by the Board under section 17, regarding the discharge of emission of any air pollutant. Based upon analysis report consent is granted or refused to the industry.
- Just like Water Act, the Air Act has provisions for defining the constitution, powers and functions of Pollution Control Boards, funds, accounts, audit, penalties and procedures.
- Section 20 of the Act has provision for ensuring emission standards from automobiles. Based upon it, the state government is empowered to issue instructions to the authority incharge of registration of motor vehicles (under Motor Vehicles Act, 1939) that is bound to comply with such instructions.
- As per section 19, in consultation with the State Pollution Control Board, the state government may declare an area within the state as 'air pollution control area' and can prohibit the use of any fuel other than approved fuel in the area causing air pollution. No person shall, without prior consent of State Board operate or establish any industrial unit in the 'air pollution control area.'

The Environment (Protection) Act, 1986

The Environment (Protection) Act, 1986, came into force on November 19th, 1986, the birth anniversary of our Late Prime Minister Indira Gandhi, who was a pioneer of environmental protection issues in our country. The Act extends to whole of India. Some terms related to environment have been described as follows in the Act.

- Environment includes water, air and land and the inter-relationships that exists among and between them and human beings and all other living organisms and property.
- Environmental Pollution means the presence of any solid, liquid

behaviour among the masses. For this education should be treated as the vital force.



LET US KNOW

- The wide concept **conservation** includes everything from the protection of wild life to the process of sustainable development.
- The objectives of the conservation of resources are maintenance of fundamental ecological process, preservation of bio-diversity etc.
- The important laws pertaining to be conservation and protection of the environment passed by the Government of India are- Wildlife (Protection) Act 1972, Water (Prevention and Control of Pollution) Act 1974, Forest (Conservation) Act, 1980 etc.

CHECK YOUR PROGRESS



Q 1: Give the concept of conservation and protection of environment.

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Q 2: Mention the Salient features of Water (Prevention and Control of Pollution) Act, 1974..

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Q 3: Write short notes on- Article 48 A.

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and degradation is the vital responsibility of man who owns it. But owing to the lack of knowledge in scientific ways and means of conservation of soil by the agricultural people, soil pollution appears to be a problem. In this regard specific role of individual may be presented below-

- While constructing individual houses, the existing trees should not be uprooted.
- We must grow different types of ornamental trees, herbs and trees in the garden and also grass in the open areas which will kind the soil and prevent its erosion
- Individual should develop the habit of planting shady trees on the roadside.
- Biological manure rather than chemical fertilizer should be used for agricultural purpose.
- Examination of soil before cultivation is necessary.

Conservation of Energy

Energy is the main resource for development of human civilization. Most of the activities of present day large and growing population require massive energy inputs. Hence the need for conservation of energy becomes all the more essential. Energy conservation is an attempt to reduce the amount of energy used for domestic and industrial purposes, particularly in the developed countries.

Every individual may help to minimize the problem through formation of good habit of saving energy at home. Individual role in this regard may be mentioned below-

- Lights and electrical gadgets should be turned off habitually when not in use.
- Energy of heat should be used from the natural resources like the sunshine when available.
- High voltage energy from heater should be used only when it is indispensible.

for protection of the forest resources.

- Individuals should be aware of the rules and laws framed by the government on conservation of the forest products and should abide by them.
- Local community people and the forest department should cooperate in conserving the forest resources from the anti-social elements.
- People should be trained by the forest department how to conserve and preserve the forest resources.
- Forest security guards should be well trained and they should be well equipped with arms to detect illegal poachers and smugglers of the woods.

The role of the society in conserving and protecting the environment is very significant. It is important for us to realize that we are all part of the environment and it is we who have to take more care of flora and fauna both because they are beautiful and useful to us. So every one of us living on this earth must try to save animal and plant life. If we carefully look after our environment, then it will last our long as there is life on earth.

There are numerous examples of society playing vital role for the cause of environmental conservation and protection through various measures. The **'Chipko'** movement by the people of Uttarakhand region of India is an extra ordinary movement of the poor for the conservation of resources. Chipko meaning 'to hug' in Hindi, was started as movement of woman determinedly hugging trees to prevent them from being cut. It accomplished great success in at national as well as international level. The Narmada Bachao Andolan lead by Ms. Medha Patkar is another brilliant example of society movement playing great role in conservation of resources. Thus, the society can play very important role in conservation and protection of our environment for sustainable development and meaningful existence of man on earth.

system in order to prevent exploitation, pollution, destruction and to ensure the future use of the resources and to attain sustainable development.

- Conservation of nature may be possible through protection of nature.
- Several laws pertaining to the conservation and protection of environment have been formulated such as Article 48 (A), Article 51A (G) etc.
- The constitution of India has included environmental protection and conservation as one of the fundamental duties of the citizens of Indian Republic. Gradually the parliament and State Legislatures are empowered to legislate the Central, State and Concurrent lists of subjects like noise control, land improvement, irrigation, town planning, slum clearance, housing schemes, pest control, water pollution, forests, wildlife, recreation etc. As a result, on some of the subjects new laws have been enacted. The subject and laws are as follows:
  - The Factories Act, 1948.
  - The Insecticides Act, 1968.
  - The Wildlife (Protection) Act, 1972.
  - The Water (Prevention and Control of Pollution) Act, 1974.
  - The Forest (conservation) Act, 1980.
  - The Air (Prevention and Control of Pollution) Act, 1981.
  - The Environment (Protection) Act, 1986.
- Individuals are the most significant agents of environmental conservation and protection.
- One must take measures to conserve our bio-diversity like encouraging plantation of trees, preventing deforestation etc.
- We as individuals should also take measures to conserve energy, soil, water, wildlife etc.
- Concept of sustainable development maintains that it is possible to achieve sound environmental planning without putting a break on human aspirations for future social improvement. It aims at improvement of living standard and quality of people's life both now and for the future generations.
- The UN Conference on environment held in Rio-De-Janerio in 1992, with its Agenda 21, had pledged the support for movement towards this sustainable development.

Ans to Q No 4: Three measures to conserve water are as follows:

- Taps should not be kept open after washing, bathing and brushing etc.
- Water leakage should be checked and immediately repaired.
- Water control devise of the taps should be used for economic conservation of water at home.

Ans to Q No 5: The role of the society in conserving and protecting is very significant. It is important for us to realize that we are all part of the environment and it is we who have to take more care of it plants and animals needs to be saved, both because they are beautiful and useful to us.



8.7 MODEL QUESTIONS

A) Very Short Questions (Answer each question in about 50 words)

Q 1: What do you mean by the term 'Conservation'?

Q 2: What does the World Community in the Nairobi Conference of 1968 proposed for?

Q 3: What does the term 'Protection' implies?

Q 4: What do you mean by the term "Chipko"?

B) Short Questions (Answer each question in about 150 words)

Q 1: What are the constitutional provisions for environmental protection in India?

Q 2: What are the roles of individual in conservation of energy?

Q 3: What are the responsibilities of individual towards conservation of wildlife?

C) Long Questions (Answer each question in about 300-500 words)

Q 1: Discuss the salient features of Wildlife (Protection) Act 1972.

Q 2: What are the different methods to propagate environmental awareness in the society?

Q 3: Discuss the role of the individual and society in conserving and protecting the environment.

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surface water, ground water, land, minerals and oil and all other elements from the earth. We living beings are the major part of the environment. Our survival depends on the environment. From the discussion of the previous units, it is clear to you that environment tries its best to protect us but we the selfish human being on the earth for our own interest are destroying our beautiful green earth. Excessive use of fossil fuel for energy or power, industrial waste material increases the numbers of pollutants causing danger to the environment and destroys its equilibrium. If this goes on, one day will come when we have to buy oxygen for survival. For our safe and easy living, we have to protect our Earth, our environment. In this unit, we will discuss about the conservation and protection of environment and various legal and constitutional provisions for environmental protection.

9.3 MEANING OF CONSERVATION AND PROTECTION OF ENVIRONMENT

Environmental conservation and protection means the planning and management of resources so as to secure their waste use and continuity of supply while maintaining and enhancing their quality, value and diversity. The resources of the environment may be man-made or natural. Conservation of environment includes preservation of all these resources. It includes the preservation from destructive influences, natural decay or waste.

Conservation and protection of environment simply means the careful use of land, air, water minerals and other natural resources. It is a planned and use of environment using all planning foresight and cooperation that man can do. It is actually the intelligent use of natural and man-made resources. It is again important to note that conservation or protection of environment includes the use of agriculture, energy flow, waste management, wildlife management, natural parks, sanctuaries, water management as well as it emphasizes on non-pollution energy development. One important thing about conservation of environment is that it not only emphasis on intelligent use of resources but also emphasizes on the utilization of the resources for future generation.

- Conservation and protection of environment is the careful use of natural resources.
- It means the planning and management of the environment
- It implies the consciousness of people towards the environment.
- It includes the use of land, water, minerals, agriculture, energy flow, waste management, wildlife management, Natural Park, sanctuaries, water management etc.
- It emphasizes on the development of non-pollution renewal energy.
- It means conservation of environment or all the resources not only for the present but also for the future.



LET US KNOW

The major features of Environmental conservation are-

- Conservation and protection of environment is the careful use of natural resources.
- It means the planning and management of the environment
- It implies the consciousness of people towards the environment.

Objectives of environmental conservation and protection

The following are main objectives of environmental conservation-

- To maintain essential ecological processes and life support system
- To preserve the biological diversity
- To ensure sustainable development.
- To ensure proper utilization of species and eco-system
- To preserve the natural resources not only for present but also for the future.
- To make wise use of land, water , air forest and minerals
- To maintain an equilibrium in all the spheres of Earth.
- To prevent the environmental stressors and hazards.
- To maintain the earth sound and greenery for all biotic and abiotic components to live in peacefully.

storage for fish, germplasm banks for seeds, pollen, semen, ova etc. Plants are maintained and preserved more carefully than animal. In the Zoo or botanical garden or in the museum, we often see some of these resources which are protected very carefully.



ACTIVITY-11.1

Mention some example of means of In situ and Ex situ conservation. What initiative can you take for ex situ conservation at your home?



CHECK YOUR PROGRESS

Q 3: What do you mean by In situ Conservation?

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9.4 LEGAL PROVISIONS FOR CONSERVATION AND PROTECTION OF ENVIRONMENT

From the above discussion, it is clear that environmental protection and conservation is very essential. Therefore, we all must strive to protect our Environment. It is important to note that the first international conference on environment was held in Stockholm, the Swedish Capital on 5th June, 1971. Therefore, 5Th June is celebrated as UN Environmental Day. This is known as United Nations Conference of Human Environment. You all know that our country got its independence in 1947. Several environment protection initiatives had been taken before the independence. As such there existed environmental legislation before independence. But, after the Stockholm Conference, the conception of Environmental conservation and awareness has got tremendous attention all over the world. Here, we are going to discuss about the different legal provision that has been taken by Indian Government for Environmental Conservation and Protection-

- ***National Council of Environmental Policy and Planning in 1972 :*** The first landmark in the field of environmental protection was setting up of the National Council of Environmental Policy and Planning in

prevention and control of pollution, afforestation and regeneration of the degraded areas of the environment.

- ***The Environmental (Protection) Act 1986 :*** This Act authorizes the central government to protect and improve the quality as well as control and reduce all forms of pollution from all the sources that may cause pollution. It also prohibits the setting and operation of any industrial facility on environmental grounds.
- ***The Municipal Solid Waste (Management and Handling) Rules 2000 :*** This Act or rule was set by the Government to apply to every municipal authority for the collection, segregation, transportation and disposal of municipal solid waste to keep the place hygienic and ecologically safe.
- ***The Noise pollution (Regulation and Control Amendment) Rules 2002 :*** This rule set by the Government lay down some terms and condition that are essential to reduce noise pollution-like permission of using loud speakers or public address system during night hours(between 10.00pm to 12.00am) during the cultural or religious festivals or occasions.
- ***The Biological Diversity Act, 2002 :*** The Biological Diversity Act, which was adopted in 2002, is the result of attempt to realize the objectives of United Nations Convention on Biological Diversity (1992). The main objective of this act is to conserve the biological resources and associated knowledge. It also lays emphasis on facilitating access to them in sustainable manner. To realize these objectives of this Act, the National Biodiversity Authority has been established in Chennai.
- ***The National Green Tribunal Act, 2010 :*** The aim of enacting this act is for effective and expeditious disposal of cases relating to environment protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property.
- ***E - Waste/ Management and Handling Rules, 2011 :*** The primary objective of this rule or act is to reduce the use of hazardous

9.5 CONSTITUTIONAL PROVISIONS FOR CONSERVATION AND PROTECTION OF ENVIRONMENT

As already mentioned there are various government and non-government organizations who are trying their best for the environmental protection. Even our Indian Constitution has also given special emphasis on the environmental conservation; hence it has guaranteed some environmental right to the people. Here we will discuss about the constitutional provisions for conservation and protection of Environment and ecological security.

As per the 42nd Amendment act 1976, the Constitution laid down the Directive principles of State policy as well as fundamental rights in which Environmental protection and improvement were explicitly incorporated into the constitution. It is again important for you to know that the amendment has introduced certain changes in the seventh Schedule of the Constitution. The subject "Forest" and "Wildlife" are transferred to the Concurrent list (Joint responsibility of Centre and State) from the state list. This has out the matter of environmental protection in National Agenda.

Following are the constitutional provisions for Environmental protection under directive principles and fundamental duties-

1. According to Article 48A: "The state shall endeavor to protect and improve the environment and to safeguard the forest and wild life of the country".
2. According to Article 51-A: "It shall be the duty of every citizen of India to protect and improve the natural environment including forests, lake, rivers and wildlife and to have compassion for living creatures". (Fundamental Duty)
3. According to Article 253: "Notwithstanding anything in the foregoing provisions of this Chapter, Parliament has power to make any law for the whole or any part of the territory of India for implementing any treaty, agreement or convention with any other country or countries or any decision made at any international conference, association or other



CHECK YOUR PROGRESS

Q 8: Fill in the blank

A. The subject "Forest" and "Wildlife" are transferred to the ..... from the state list.

B. Right to Wholesome Environment is listed in ..... Article.

Q 9: What are the fundamental rights related to Environment?

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9.6 LET US SUM UP

- Environmental conservation and protection means the planning and management of resources so as to secure their waste use and continuity of supply while maintaining and enhancing their quality, value and diversity.
- Conservation and protection of environment simply means the careful use of land, air, water minerals and other natural resources.
- According to Whyte, "Environmental Conservation has been defined as the management for the benefit of all life including mankind of the biosphere so that it may yield sustainable benefit to the present generation which maintaining its potential to meet the needs and aspiration of the future generations".
- The World/UN Environmental Day is celebrated on 5th June
- The main feature of Environmental Conservation is that -it emphasizes on the development of non-pollution renewal energy; it means conservation of environment or all the resources not only for the present but also for the future.
- The objective of Environmental conservation is --to maintain essential ecological processes and life support system, to preserve the biological diversity, to ensure sustainable development.



9.7 FURTHER READING

1) Bhattacharya K, Bhattacharya R and Sharma S (2012): Environmental Education, Assam Book Depot.

2) Sharma P.D (1990): Ecology and Environment, Rastogi Publishers, Meerut.

3) Sharma R. A(2010) : Environmental Education, R.Lall Book Depot

4) Singh S and Dubey A (1989): Environment Management, Allahabad University.



9.8 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: 5th June.

Ans to Q No 2: Environmental conservation is essential -

- To maintain essential ecological processes and life support system.
- To preserve the biological diversity.
- To ensure sustainable development.

Ans to Q No 3: This is the conservation of genetic resources through their maintenance within natural or even human made eco-system in which they occur.

Ans to Q No 4: The Air Prevention and Control of Pollution Act 1981 was enacted under Article 253 of Directive Policy Indian Constitution.

Ans to Q No 5: This main objective of this act is to conserve the biological resources and associated knowledge. It also lays emphasis on facilitating access to them in sustainable manner.

Ans to Q No 6: The Water Prevention and Control of Pollution Act 1974, the Biological Diversity Act, 2002

Ans to Q No 7: In Chennai, India.

UNIT 10 : SUSTAINABLE DEVELOPMENT

UNIT STRUCTURE

10.1 Learning Objectives

10.2 Introduction

10.3 Concept of Sustainable Development

10.4 Characteristics of Sustainable Development

10.5 Need of Sustainable Development

10.6 Education for Sustainable Development

10.7 Let Us Sum Up

10.8 Further Reading

10.9 Answers To Check Your Progress

10.10 Model Questions

10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to -

- define the concept of sustainable development;
- list the characteristics of sustainable development;
- describe the importance of sustainable development; and
- explain the role of education on sustainable development.

10.2 INTRODUCTION

In the previous unit, you have gone through a lot about environment, its different components, different hazards that come to environmental security and the different provisions taken by organization of national and international importance, government. But you should be very clear that only protecting and conserving environment from the hazards is not enough, we have also protect it for future. With the excess use of technologies, the greenery of the earth is decreasing which may threaten our future generation. We earn money not only for present expenditure but also save it for future expenditure, so as with the environment. We have to be serious about future ecological balance. In this unit, we are going to discuss such a topic related

development was given by-World commission on Environment -
"Sustainable Development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs"

Again, the World Conservation Strategy Report defined sustainable development as 'the integration of conservation and development to ensure that modifications to the planet do indeed secure the survival and wellbeing of all people'.

On the basis of the above definitions it can be marked that sustainable development means meeting four objectives at the same time:

- Social progress that recognizes the needs of everyone;
- Effective protection of the environment;
- Prudent use of natural resources; and
- Maintenance of high and stable levels of economic growth and employment.

10.4 CHARACTERISTICS OF SUSTAINABLE DEVELOPMENT

Sustainable development can be characterized as follows:

- **Interdependence:** understanding the connections and links between all aspects of our lives and those of other people and places at a local and global level, and that decision taken in one place will affect what happens elsewhere.
- **Citizenship and Stewardship:** recognizing that we have rights and responsibilities to participate in decision-making and that everyone should have a say in what happens in the future.
- **Needs and Rights of Future Generations:** learning how we can lead lives that consider the rights and needs of others, and that what we do now has implications for what life will be like in the future.
- **Diversity:** understanding the importance and value and diversity of lives- culturally, socially, economically and biologically- and that all our lives are impoverished without it.

Q 3: Write two characteristics of Sustainable development.

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10.5 NEED OF SUSTAINABLE DEVELOPMENT

Increasing environmental degradation had depleted our planet Earth, which has affected not only the eco-system but also degraded the quality of living.Therefore to save the planet from this threat, sustainable development is the need of the hour.To maintain the eco-system, sustainable revolution will have to take place rapidly and consciously on many different levels and in many different spheres.

The need of sustainable development can be discussed in the following ways-

- **Conservation of Resources:** The prime need of sustainable development is the conservation of natural resources. It is essential to sustain the resources both for present and future usage. Indeed, one of the key features of sustainable development to prevent environmental depletion and contribute towards new development.
- **Management of resources:** Only preservation of resources is not enough. If the resources are not managed properly, it is equivalent to depletion. For a worldwide sustainable growth, there is a need for efficient and effective management of available resources, which is the prime objective of sustainable development.
- **Sustainable Technology:** Sustainable development is essential because it ensures the involvement of sustainable technologies based upon the use of non-renewable resources by taking advantage of the renewable energies.
- **Sustain Biodiversity:** Unsustainable development and overconsumption practices often harm the biodiversity, creating imbalances. Sustainable development is essential as it encourage the use of renewable energy resources like organic farming practices that do not harm the biodiversity.

environmentally responsible and saving energy to create new development projects. It is essential for conservation of resources as well as ensuring the quality of life. But for developing new development project people must be made aware of the significance of the sustainable development and the way of sustaining the resources. There can be no powerful measure than education which can empower people with the knowledge of sustainability. Environmental education is the powerful tool of making people aware of the environmental threats and sustainable development.

In the words of Mishra, "Environmental education appears to be a process that equips human beings with awareness, knowledge, skills, attitudes and commitments to improve environment".

Environmental Education and Sustainable Development:

As mentioned above, environmental education plays an important role in sustainable development. The role can be discussed in the following ways-

- Environmental education is important tool for achieving sustainable utilization resource.
- Environmental education can develop values and skills necessary for conservation and wise utilizations of natural resources leading sustainable development.
- It can bring about awareness and develop concern for the long term effect of development activities upon the environment.
- It can foster love towards the nature that help people to understand the essential harmony between man and nature.
- Environmental education can make people understand the problem of development as an international issue.
- Environmentally informed and educated citizens can understand their role at local and regional level as well as the role of government to make international environmental agreements to achieve sustainable development across the globe.
- Environmental education will make the people aware of all those factors that lead to depletion of the resources.
- Population education which is an important part of environmental education will help the common man to be aware of the danger of

environmental protection, economic growth, and social equity

- The most widely used and a common definition of sustainable development was given by-World commission on Environment - "Sustainable Development is the development that meets the need of the present without compromising the ability of future generation to meet their own needs"
- Sustainable development is essential for Conservation of Resources, Management of resources, Sustainable Technology as well as Ensuring quality life.
- Environmental education is the powerful tool of making people aware of the environmental threats and sustainable development.
- In the words of Mishra, "Environmental education appears to be a process that equips human beings with awareness, knowledge, skills, attitudes and commitments to improve environment".
- Environmental education can make people understand the problem of development as an international issue.



10.8 FURTHER READING

1) Bhattacharya, K, Bhattacharya, R. and Sharma, S. (2012). Environmental Education. Guwahati: Assam Book Depot.
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4) Sigh, S. and Dubey, A. (1989). Environment Management. Allahbad University.

c) Sustainable Technology: Sustainable development is essential because it ensures the involvement of sustainable technologies based upon the use of non-renewable resources by taking advantage of the renewable energies.

d) Sustain Biodiversity: Unsustainable development and overconsumption practices often harm the biodiversity, creating imbalances. Sustainable development is essential as it encourage the use of renewable energy resources like organic farming practices that do not harm the biodiversity.

e) Financial Stability: Development of renewable energy technologies not only helps in conserving the resources, but also helps in sustain financial stability of the country or a nation.



10.10 MODEL QUESTIONS

A) Short Questions: (Answer each question in about 50 words)

Q 1: What is meant by Sustainable Development?

Q 2: What was the theme of Brundtland Report?

Q 3: Mention some of the non-renewable resources.

B) Short Questions: (Answer each question in about 150 words)

Q 1: Describe the definition given by World commission on Environment and Development on sustainable development in your own words.

Q 2: Briefly explain about the fundamental components to sustainable development.

Q 3: Briefly describe how education is related with sustainable development.

C) Long Questions: (Answer each questions in about 300-500 words)

Q 1: Write the characteristics of sustainable development.

Q 2: Discuss the importance of sustainable development.

Q 3: Explain the role of education on sustainable development.

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the portion of the earth occupied by living organisms.

Man has always been dependent on the environment. Initially, when the size of the population on earth was small and limited resources were required to satisfy their needs, human activities did not severely affect the environment. But, the gradual increase of population on earth led to over exploitation of nature and its resources to such an extent that the natural balance of our environment got destroyed. Environmental problems across the world have reached such a stage that the entire human race has come under serious threat from environmental problems. It was being gradually realized that educating people about environmental problems and the issues related to the effects of their actions against the environment, is of grave importance. This realization of mankind led to the emergence and development of the concept of environmental education. This unit introduces you to the problems of Environmental Education and its prospect in Assam.

11.3 PROBLEMS OF ENVIRONMENTAL EDUCATION

The importance and necessity of Environmental Education has been increasingly realized at the local, national and the international level. Although there are specific problems in the implementation of Environmental Education our attention may be focused to the following points-

- Environmental Education is a subject-matter which is comprehensive in nature. It comprises variety and multiplicity of elements and constituent components. This has created a problem in designing courses for Environmental Education.
- Success of any scheme of education always depends on the quality and performance of teachers concerned. One of the problems related to Environmental Education is the lack of proper training of the teacher.
- Environmental Education is a multi-disciplinary and inter-disciplinary subject. It calls for **unprecedented** collaboration in teaching which is difficult to achieve practically.
- Environmental Education programmes require certain infrastructure



unprecedent: If Something is unprecedent, it has never happened before.

problems for the implementation of the environmental education programme.

11.3.1 Specific environmental problems in Assam

Assam is better known for its rich natural environmental potentials and resources. We have the enviable position so far as the state's water resources, forest resources, mineral resources and power resources are concerned. In spite of the abundance of the natural resources, the people and the state as a whole remain economically poor, backward and industrially under-developed. The obvious reason is that the natural resources of the state could not be effectively utilized owing to the lack of man-power resources and many other reasons. In the previous section we have discussed some of the problems faced by environmental education. Our state Assam has been facing some peculiar problems in the field of environmental education in addition to the problems discussed above. Our immediate attention needs to be drawn to the following problems-

- **Rapid growth of population**

  Growth of population in Assam is said to be unusually high that has a terrible effect on the natural resources. The total population of Assam, as per 2011 census is 31,205,576 of which 15,939,443 are male and 15,266,133 are female respectively. The population of Assam forms 2.58 percent of India in 2011.

- **Large scale migration and infiltration**

  It is an established fact that there is large scale infiltration of foreigners from the neighbouring country like Bangladesh. This infiltration is quite instrumental not only in the destruction of the natural resources, but also in the change in the demographic pattern of the indigenous people of the state.

- **Destruction of the forest resources**

  Assam's valuable forest resources are fast deteriorating due to desperately cutting down of trees and smuggling out of the woods outside the state in convenience with the forest officials.

the hilly land, filling of the marshy land, and constructing unauthorized houses are common features. This has created the problem of land pollution and land erosion in the habitable areas.



LET US KNOW

The specific problem of environmental education are-

- Lack of trained teachers
- Lack of proper infrastructure facilities
- Too much of curriculum load
- Very limited research
- Lack of political will
- Lack of funds
- Shortage of properly trained education officers etc.

Apart from these, specific environmental problems with special reference to Assam are-

- Destruction of the forest resources
- Growth of the Industries
- Problem of the wild animals etc
- Use of Plastic Bags



CHECK YOUR PROGRESS

Q 1: Mention the specific environmental problems with special reference to Assam.

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11.3.2 Prospects of Environmental Education

Every new subject at its initial stage is likely to be confronted with certain organisational and instructional problems. Environmental education is also not an exception to this. But keeping in view possible impact on the welfare and wellbeing of our future generation, the importance and prospects of this subject can be easily

- **Solution to Socio-Economic Problems**

  Environmental Education can ensure solution to the major socio-economic problems confronted by modern man in society. Solution to problems like population explosion, depletion of power resources, deforestation and destruction of man's natural habitat, pollution of air, water and land, landslides, global warming etc lie with the Environmental Education to the people. Socio-economic problems of a country cannot be solved unilaterally.

- **Maintaing health and hygiene**

  Environmental Education is at present related to the vital problem of keeping health and hygiene of people. Many of the serious diseases like cancer and formation of tumour etc, have been found to have originated from environmental pollution of air and water in the biosphere and stratosphere. It has therefore, thrown a formidable challenge to be met by modern men through the use of medical science. Environmental study provides scope for studying man's physiological science today at its higher level.

- **Providing scope for new creativity**

  Environmental education provides necessary scope and incentive to the creative genius in undertaking higher studies and research on various issues and problems relating to environment. Serious people can undertake higher studies and research on various environmental issues and problems. This education can infact, bring in the creative geniuses together to think, feel and act for a better life and environment for the future.

The Indian Constitution too, has given adequate importance to environmental education and values -

Article 48-A of Indian constitution states that -

"The state shall endeavour to protect and improve the

responsibility on creating environmental awareness. More particularly the NGO's like **Save Guwahati and Build Guwahati (SGBG)** has demanded the survey of hills, wetlands and plain lands of the Guwahati city. Some of these organizations like **Assam Science Society** have their programmes of giving science education to people on environment. These organizations can act as a link between the government and the people in regard to environmental problem and their solution. The State government may offer financial assistance to the NGO's in promoting this education.

- **Agricultural Extension Education**

  The Agricultural University in the state can offer extension service to the rural agricultural people as a part of environmental education. The University may organize training centres in the agricultural areas of the state and give education to people in respect of the use of fertilizer, chemicals, conservation of soil and irrigation system etc. The government Agricultural Department may also offer necessary help and guidance to people in this regard.

- **Role of the Government**

  The department of environment and forest, Government of Assam, has made various provisions for conservation and protection of natural resources. It organizes activities like elephant festival, forest festival etc. to sensitize people about environmental issues and problems. The Govt. of Assam constituted **Pollution Control Board of Assam (PCBA)** with the purpose of protecting the environment and preventing and controlling pollution in the state. The Department of environment and Forest and the PCBA can play important role in bringing about environmental awareness and understanding among the people of the state.

- **Role of the University authorities**



CHECK YOUR PROGRESS

Q 2: Briefly explain two provisions of Environmental Education in Assam.

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Q 3: Write about the "Prospects of environmental education - Write within 50 words.

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ACTIVITY 14.1

How can public awareness on environment be generated? Give your comments.

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11.4 LET US SUM UP

- Environmental Education covers a wide variety of elements, things, matters and beings from the biosphere or the eco-system. The term bio-sphere is the combination of two terms, viz. bio and sphere. The term bio is originated from the Greek term bios, which means human life. Similarly, the term sphere is also originated from another Greek term Sphaire which means a ball. In brief the term biosphere means those parts of the earth occupied by living organisms.
- Environmental Education is a programme dealing with the processes of the inter-relationship of man and his environment.
- There is no doubt that Environmental Education Programmes generates awareness and sensitivity. But such programmes may not be effective unless they do not focus on the necessary skills and

11.6 ANSWERS TO CHECK YOUR PROGRESS

Ans to Q No 1: The specific environmental problems of Assam are-

- Rapid growth of population
- Large Scale migration and infiltration.
- Destruction of the forest resources.
- Unplanned growth of industries.
- Problem of automobiles.
- Solid Waste Problem
- Flood and erosion
- Man-animal conflict
- Unauthorized cutting and grabbing of land

Ans to Q No 2: The two Provisions of Environmental education in Assam are-

- The Agricultural University in the state can offer extension service to therural agricultural people as a part of environmental education. The University may organize training centres in the agricultural areas of the state and give education to people in respect of the use of fertilizer, chemicals, conservation of soil and variegation system etc.
- Various Govt. and Non-Government Organisation (NGO) working in the field of environmental education through the non-formal mode of education. More particularly the NGO Save Guwahati and Build Guwahati (SGBG) has demanded survey of the hills, wetlands and plain lands of the Guwahati city.

Ans to Q No 3: Environmental Education is a subject closely associated with the problem of socio-economic development of the developing and under-developed countries of the world and its people. These countries are confronted with the major problems of population



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