

Environment Sustainable Development Class 11 Notes

Chapter 9 Indian Economic Development

Concept of Environment

Environment may be defined as all those conditions and their effects which influence human life. It is the sum total of surrounding and the totality of the resources.

According to the Environment Act 1986, "Environment includes, water, air and land and the inter relationship which exists among and between water air land and human beings and other creatures, plants, micro-organisms and property".

Functions of Environment

- It assimilates waste.
- It sustains life by providing genetic and bio diversity.
- It also provides aesthetic services like scenery etc.

Significance of Environment

- Environment offers resources for production.
- Environment sustains life.
- Environment Enhance quality of life.

Two Basic Problems Related to Environment

- Problem of pollution.
- Problem of excessive exploitation of natural resources.

Pollution It refers to those activities of production and consumption which challenge purity of air and water and serenity of the environment.

Pollution unfolds itself in three ways

- Air Pollution Pollution of air implies pollution of an essential elements of life.
- Water Pollution Water is an equally important element of life and its pollution is equally serious. Polluted water is the principal cause of diseases like diarrhoea and hepatitis.
- Noise Pollution Excessive noise causes irritation and unnecessarily fatigues the body and the mind.

Causes of Environmental Degradation

- Population explosion
- Widespread poverty
- Increasing urbanisation
- Increasing use of insecticides, pesticides and chemical fertilisers
- Rapid industrialisation

- Multiplicity of transport vehicles
- Disregard to the civic norms

How to Save Environment?

Following measures need to be taken to protect environment

- Social awareness
- Population control
- Enforcement of Environment Conservation Act
- Afforestation campaign
- Control over industrial and agricultural pollution
- Water management
- Management of solid waste
- Improvement in housing

Sustainable Development

It is that process of economic development which aims at raising the quality of life of both and future generation.

Features of Sustainable Development

- Sustained rise in real per capita income and economic welfare
- Rational use of natural resources
- No reduction in the ability of future generations to meet their own needs
- No increase in pollution

Strategies for Sustainable Development

- Input-efficient technology.
- Use of environment-friendly sources of energy.
- Integrated Rural Development.
- Shift to organic farming.
- Manage the wastes.
- Stringent laws on the disposal of chemical effluents.
- Awareness to conserve natural assets for inter-generational equity.
- Public means of transport.

Factors Contributing to Deforestation

- Growing industrial demand for wood and other forest products.
- Growing demand for wood owing to explosive rise in population.
- River valley projects.

The economic development we have achieved so far is on the cost of environmental degradation. The era of globalisation promises higher economic growth, but on the same side it had adverse consequences that had impacted environment.

In order to understand the sustainable path of development, the significance and contribution of environment to economic development should be understood. With this in mind, we would be able to achieve sustainable development in India.

Environment is defined as the total planetary inheritance and the totality of all resources. It includes all the biotic (e.g. birds, animals, plants, forests, etc) and abiotic (e.g., water, Sun, land, mountains, etc) factors that influence each other.

According to the Environment Act-1986, 'Environment includes, water, air and land and the inter relationship which exists among and between water, air, land and human beings and other creatures, plants, micro organisms and property'.

Functions of Environment

Environment performs four vital functions, which are as follows

- **Supply Resources** Resources include both renewable and non-renewable sources of energy. Resources which can be used without any fear of getting depleted are renewable sources of energy, e.g. trees, fishes, etc. Non-renewable sources are those which are getting depleted or exhausted. e.g. fossil fuel, etc.
- **Assimilates Waste** Production and consumption activity generates wastes. It is generally in form of garbage which is absorbed by the environment.
- **Sustains Life** Sun, soil, air, water are the essential ingredients of environment for the human life. Absence of these will lead to an end of life on the Earth.
- **Aesthetic Services** Environment provides aesthetic services like scenery, which includes rivers, ocean, mountains and deserts. Enjoying these surroundings adds to the quality of life.

Environmental Crisis

The environment is performing its functions without any interruption as long as the demand of these functions is within its carrying capacity. This means that if the rate of extraction of resources will be above the rate of their regeneration, the environment will fail to perform its functions.

Resources are becoming extinct and wastes are generated beyond the absorptive capacity of the environment. All this has led to the environmental crisis, it refers to ecological crisis that occurs when the environment of a species or a population changes and destabilises its survival.

Consequence of Environmental Crisis

The points given below describe the consequences of environmental crisis

- Development has polluted and dried up rivers and other aquifers, which has deteriorated the quality of water.
- Intensive and extensive excavation of both renewable and non-renewable resources has exhausted some of the vital resources, compelling to spend a huge amount of money on technology and research to explore new resources.

- Decline in air and water quality have resulted in increased number of respiratory and water borne diseases i.e., expenditure of health care is also rising according to a data 70% of water of . India is polluted which cannot be used for drinking purpose.

Global Environmental Issues

The environmental issues which affect the whole world are called global environmental issues such as global warming and ozone depletion. These issues also contribute to increased financial commitments for the government.

These issues are discussed below

1. Global Warming

The gradual increase in the average temperature of Earth's lower atmosphere is called global warming.

Causes/Effects

It occurs due to greenhouse gases (carbon dioxide, methane and other gases which have the capacity to absorb heat) through burning of fossil fuels (coal and petroleum) and deforestation (increases the carbon dioxide level in atmosphere). Much of the recent observed and projected global warming is human induced.

The atmospheric concentrations of carbon dioxide and methane have increased by 31% and 149% respectively above pre-industrial level since 1750.

Different effects of global warming are described below

- During the past century, the atmospheric temperature has risen by 1.10° F (0.60° C).
- Melting of polar ice resulting in increase in sea level (during the past century, sea level has risen by several inches) and the risk of coastal flooding has increased.
- Disruption of drinking water supplies dependent of snow melts.
- Extinction of species.
- More frequent tropical storms.
- Increased incidence of tropical diseases.

Action Taken

A United Nations Conference on Climate Change, held in Tokyo, Japan, in 1997, resulted in an international agreement to fight global warming which called for reductions in emissions of greenhouse gases by industrialised nations.

2. Ozone Depletion

It refers to the phenomenon of reductions in the amount of ozone layer in the stratosphere.

Causes/Effects

It is caused by high levels of chlorine and bromine compounds in the stratosphere. Origin of these compounds are Chloro fluorocarbons (CFCs), used as cooling substances in air conditioners and refrigerators or as aerosol propellants and bromofluoro-carbons.(halons) used in fire extinguishers.

Different effects of ozone depletion are described below

- More ultraviolet radiation comes to Earth causing damage to living organisms, skin cancer in humans, low production of phytoplankton affecting aquatic organisms.

- Influences the growth of terrestrial plants.

Action Taken

Between 1979 to 1990, a reduction of 5% in ozone layer was detected. Since ozone layer prevents most harmful ultraviolet radiation from passing through the Earth's atmosphere, so reduction in ozone layer generated worldwide concern, leading to adoption of the montreal protocol banning the use of Chlorofluorocarbon (CFC) compounds as well as other ozone depleting chemicals such as carbon tetrachloride, trichloroethane (also known as methyl chloroform) and bromine compounds known as halons.

State of India's Environment

India has rich quality of natural resources in plenty of amount.

It is clear from the following points

- India has rich quality of soil, hundreds of rivers and tributaries, lush green forests, plenty of mineral deposits beneath the land surface, vast stretch of the Indian Ocean, ranges of mountains, etc.
- The black soil of the Deccan Plateau is particularly suitable for cultivation of cotton. It has led to concentration of textile industries in this region.
- The Indo Gangetic plains spread from Arabian Sea to the Bay of Bengal are one of the most-fertile, intensively cultivated and densely populated regions in the world.
- India's forests though unevenly distributed, provide green cover for majority of its population and natural cover for its wildlife.
- Large deposits of iron-ore, coal and natural gas are found in the country. India alone accounts for nearly 20% of the world's total iron-ore reserves.
- Bauxite, copper, chromate, diamonds, gold, lead, lignite, manganese, zinc, uranium, etc are also available in different parts of the country.

Threat to India's Environment

Threat to India's environment is poverty, pollution, rapidly growing industrial sector. Air pollution, water contamination, soil erosion, deforestation and wildlife extinction are some of the most pressing environmental concerns of India. The developmental activities in India have resulted in pressure on its finite natural resources, besides creating impacts on human health and well-being.

Out of them the priority issues are

- Land degradation and solid waste management
- Biodiversity loss
- Air pollution with special reference to vehicular pollution in urban cities
- Management of fresh water Some of these issues are discussed below

Land Degradation in India

Land in India suffers from varying degrees and types of degradation stemming mainly from unstable use and inappropriate management practices.

The factors responsible for land degradation in India are

- Loss of vegetation occurring due to deforestation.
- Unsustainable fuel wood and fodder extraction.

- Shifting cultivation.
- Reduction into forest lands.
- Forest fires and overgrazing.
- Non-adoption of adequate soil conservation measures.
- Improper crop rotation.
- Indiscriminate use of agro chemicals such as fertilisers and pesticides.
- Improper planning and management of irrigation system.
- Extraction of ground water in excess of the regain capacity.
- Open access resource.
- Poverty of the agriculture-dependent people.

Biodiversity Loss

India is the owner of 2.5% of world's geographical area. India holds 17% of human and 20% of livestock population on its land. In order to hold livestock and human in country, country needs 0.47 hectare of land to meet the basic needs but it has only 0.08 hectare of land which causes felling of forests and soil erosion. 5.3 billion tonnes of soil is eroded every year. As a result quantity of nutrients lost due to erosion each year ranges from 5.8 to 8.4 million tonnes.

Chipko or Appiko : What's in a Name?

Chipko Movement aimed at protecting forests in the Himalayas. In Karnataka, a similar movement took a different name, 'Chpiko', which means to hug.

On 8th September 1983, when the felling of trees was started in Salkani forest in Sirsi district, 160 men, women and children hugged the trees and forced the woodcutters to leave. They kept vigil in the forest over the next six weeks. Only after the forest officials assured the volunteers of the trees will be cut scientifically and in accordance with the working plan of the district, did they leave the trees. When commercial felling by contractors damaged a large number of natural forests, the idea of hugging the trees gave the people hope and confidence that they can protect the forests. On that particular incident, with the felling discontinued, the people saved 12000 trees. Within months, this movement spread to many adjoining districts.

Air Pollution

In India, air pollution is widespread in urban areas where vehicles are the major contributors and in a few other areas which have a high concentration of industries and thermal power plants.

Pollution from vehicles and industries are the major sources of air pollution.

- **Vehicle Pollution** Vehicle emissions are of particular concern since these are ground level sources and thus, have the maximum impact on the general pollution. The number of vehicles has increased from 3 lakh in 1957 to 67 crores in 2003. In 2003, personal transport vehicles (two wheeled and cars only) contributed about 80% of the total number of registered vehicles thus, contributing significantly to air pollution load.

- Industrial Pollution India is one of the ten most industrialised nations of the world. This status has brought with it unwanted and unanticipated consequences like unplanned urbanisation, pollution and the risk of accidents. The CPCB (Central Pollution Control Board) has identified seventeen categories of industries (large and medium scale) as significantly polluting.

Management of Fresh Water

Water is an equally important element of life and its pollution is equally serious. Water becomes polluted when chemicals and other waste materials are dumped into it. Polluted water is the principal cause of diseases like diarrhoea and hepatitis. Thus, the management of fresh water is essential to sustain life.

Pollution Control Boards

To address two major environmental concerns in India; water, air and land pollution, the government set up the Central Pollution Control Board (CPCB) in 1974. This was followed by states establishing their own state level boards to address all the environmental concerns.

Different functions of pollution control boards are

- To investigate, collect and disseminate information relating to water, air and land pollution.
- To lay down standards for sewage/trade effluent and emissions.
- To provide technical assistance to governments in promoting cleanliness of streams and wells by prevention, control and abatement of water pollution.
- To improve the quality of air and to prevent, control or abate air pollution in the country.
- To carryout and sponsor investigation and research relating to problems of water and air pollution and for their prevention, control and abatement.
- To organise mass awareness programme for pollution control.
- To prepare manual, codes and guidelines relating to treatment and disposal of sewage and trade effluents.
- To assess the air quality through regulation of industries.
- State boards through their district officials, periodically inspect every industry under their jurisdiction to assess the adequacy of treatment measures provided to treat the effluent and gaseous emissions.
- State pollution boards also provide background air quality data needed for industrial siting and town planning.

In nutshell, it can be said that pollution control boards collect, collate and disseminate technical and statistical data relating to water pollution. They monitor the quality of water in 125 rivers (including the tributaries), wells, lakes, ponds, tanks, drains and canals.

How to Save Environment?

The various measures adopted by Ministry of Environment and the central and state pollution control boards may not yield reward unless, we make ourself concious. Following are required measures which should be taken to save the environment

- **Social Awareness** There should be awareness among the people regarding the threats of the increasing pollution and how can each of us contribute to the check this menace.
- **Population Control** Biggest issue which should be controlled is increasing population to protect the environment.
- **Enforcement of Environment Conservation Act** The Environment act was passed in year 1986. It was passed to check the deteriorated quality of the environment.
- **Afforestation Campaign** Extensive afforestation campaign should be launched to protect environment.
- **Water Management** There should be means which can harvest the rain water in order to use it in the areas where there is scarcity of water, so that clean drinking water can be provided to the rural people.
- **Management of Solid Waste** Management of solid waste is very essential. It should be treated chemically. Rural garbage should be converted into compost.

Meaning, Features, Needs and Strategies for Sustainable Development

According to the United Nations Conference on Environment and Development (UNCED), sustainable development can be defined as “development strategy that meets the need of present generation without compromising the ability of future generation to meet their own needs.”

Edward Barbier, a renowned personality had also given the definition of sustainable development Sustainable development is one which is directly concerned with increasing the material standards of living of the poor at grass root level.

In specific term, sustainable development aims at decreasing the absolute poverty of the poor by providing lasting and securing livelihoods that minimise resource depletion, environmental degradation, cultural disruption and social instability.

The Brudtland Commission emphasises on protecting the future generation. A moral obligation to hand over the planet Earth in good order to the future generation, i. e., the present generation should bequeath a better environment to the future generation.

The present generation can promote development that enhances the natural and built environment in the way, that are compatible with

- conservation of natural as us.
- preservation of the regenerative capacity of the worlds natural ecological system.
- avoiding the imposition of added costs or risks on future generation.

Features of Sustainable Development

- Sustained rise in real per capital income and economic welfare.
- Rational use of natural resources.
- No reduction in the ability of future generations to meet their own needs.
- Check on pollution.

A Way to Sustainable Development

According to Herman Dalay, a leading environmental economist, the main needs of sustainable development are

- Limiting the human population to a level within the carrying capacity of the environment.
- Technological progress should be input efficient and not input consuming.
- Renewable resources should be extracted on a sustainable basis, i.e., rate of extraction should not exceed rate of regeneration.
- For non-renewable resources, rate of depletion should not exceed the rate of creation of renewable substitutes.
- Inefficiencies arising from pollution should be corrected.

Strategies for Sustainable Development

1. Use of Non-conventional Sources of Energy India heavily depends on thermal and hydro power plants to meet its power needs. Both of these have adverse environmental impacts. Thermal power plants emit large quantities of carbon dioxide, which is a greenhouse gas. If it is not used properly, it may cause land and water pollution.

2. LPG, Gobar Gas in Rural Areas Rural households in India generally use wood, dungcake (upla) or other biomass as fuel. This practice has several adverse implications like deforestation, reduction in green cover and air pollution.

To rectify the situation, subsidised LPG is being provided. Besides it, gobar gas plants are being encouraged through easy loans and subsidy. LPG is the clean fuel. It does not create any household pollution and also wastage is minimised. For gobar gas plants, cattle dung is fed in the plant to function which produces gas and slurry is used as organic soil fertiliser.

3. CNG in Urban Areas In Delhi, the use of Compressed Natural Gas (CNG) as fuel in public transport system has significantly lowered air pollution and the air has become cleaner in the last few years.

4. Wind Power In areas, where speed of wind is usually high, wind mills can provide electricity without any adverse impact on the environment. The turbines moves with wind and electricity gets generated. Its initial cost' remain high but it can be recovered easily.

5. Solar Power Through Photovoltaic Cells In India, solar energy is used in different forms for agriculture products, daily use products and even to warm ourselves in winters. Through photovoltaic cells, solar energy can be converted into electricity. This technology is extremely useful for remote areas and for places where supply of power lines is either not possible or proves very costly. This technique is also totally free from pollution.

6. Bio Composting In order to increase production, we have started using chemical fertilisers which are adversely affecting the waterbodies, ground water system, etc. But again farmers in large numbers have started using organic fertilisers for production.

In some parts, cattles are maintained only because their waste prouction is very useful in form of fertiliser. Earthworm can convert organic matter into compost faster than the normal composting process.

7. Mini-Hydel Plants Mountainous regions have streams every where. Most of such streams are perennial. Mini-hydel plants use the energy of such streams to move small turbines which generate electricity. Such power plants are more or less environment friendly.

8. Traditional Knowledge and Practices Traditionally, Indian people have been close to their environment. If we look back at our agriculture system, healthcare system, housing, transport, etc we find that all practices have been environment friendly. But in recent years, we have been moving away from these practices. This has caused large scale damage to our environment.

During older times, we used Ayurveda, Unani, Tibetan and Folk systems for the treatments but now we are ignoring the traditional system and we are moving towards the western system. Not only these products were environment friendly but they are free from side effects too.

9. Biopest Control With the advent of Green Revolution, the country entered into the use of chemical pesticides to produce more which laid the adverse impacts on soil, water bodies, milk, meat and fishes. To meet this challenge, better methods of pest control should be brought. One step is pesticides based on plants like neem. Even many animals also help in controlling pests like snakes, peacocks, etc.