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SUBJECT: ENVIRONMENTAL STUDIES

CHAPTER: UNIT 6

UNIT 6: ENVIRONMENTAL POLICIES AND PRACTICES

POINTS TO BE DISCUSSED-

- **Climate change, global warming, ozone layer depletion, acid rain and their impacts on human communities and agriculture.**
- **Environment laws: Wildlife Protection Act; Forest Conservation Act; Water (Prevention and Control of Pollution) Act; Environment Protection Act; Biodiversity Act.**
- **International agreements: Montreal protocol, Kyoto protocol and climate negotiations; Convention on Biological Diversity (CBD).**

1.1 Climate change and global warming:

Climate change is one of the prime issues threatening the world's environment. Climate change will have wide-ranging effects on the environment, and on socio-economic and related sectors, including water resources, agriculture and food security, human health, terrestrial ecosystems and biodiversity and coastal zones. Changes in rainfall pattern are likely to lead to severe water shortages and/or flooding. Melting of glaciers can cause flooding and soil erosion. Rising temperatures will cause shifts in crop growing seasons which affects food security and changes in the distribution of disease vectors putting more people at risk from diseases such as malaria and dengue fever. Temperature increases will potentially severely increase rates of extinction for many habitats and species (up to 30 per cent with a 2° C rise in temperature).

Rising fossil fuel burning and land use changes have emitted, and are continuing to emit, increasing quantities of greenhouse gases into the Earth's atmosphere. These greenhouse gases include carbon dioxide (CO_2), methane (CH_4) and nitrogen dioxide (N_2O), and a rise in these gases has caused a rise in the amount of heat from the sun withheld in the Earth's atmosphere, heat that would normally be radiated back into space. This increase in heat has led to the greenhouse effect, resulting in climate change. The main characteristics of climate change are increases in average global temperature (global warming); changes in cloud cover and precipitation particularly over land; melting of ice caps and glaciers and reduced snow cover; and increases in ocean temperatures and ocean acidity – due to seawater absorbing heat and carbon dioxide from the atmosphere

Over the next decades, it is predicted that billions of people, particularly those in developing countries, face shortages of water and food and greater risks to health and life as a result of climate change

"Global warming" refers to the long-term warming of the planet. Global temperature shows a well-documented rise since the early 20th century and most notably since the late 1970s. "Climate change" encompasses global warming, but refers to the broader range of changes that are happening to our planet. These include rising sea levels, shrinking mountain glaciers, accelerating ice melt in Greenland, Antarctica and the Arctic, and shifts in flower/plant blooming times. These are all consequences of the warming, which is caused mainly by people burning fossil fuels and putting out heat-trapping gases into the air. The terms "global warming" and "climate change" are sometimes used interchangeably, but strictly they refer to slightly different things.

1.2 ACID RAIN:

When fossil fuels such as coal, oil and natural gas are burned, chemicals such as sulphur dioxide and nitrogen oxides are released into the air. **Acid rain is one of the consequences of air pollution**. It occurs when emissions from factories, cars or heating boilers contact with the water in the atmosphere. **These emissions contain nitrogen oxides, sulfur dioxide and sulfur trioxide, which when mixed with water becomes sulfurous acid, nitric acid and sulfuric acid**. This process also occurs naturally through volcanic eruptions.

The major sources of SO_2 and NO_X in the atmosphere are:

- Burning of fossil fuels to generate electricity. Two thirds of SO_2 and one fourth of NO_X in the atmosphere come from electric power generators.
- Vehicles and heavy equipment.

- Manufacturing, oil refineries and other industries.

EFFECTS OF ACID RAIN:

- Acid rain is very harmful to agriculture, plants, and animals. It washes away all nutrients which are required for the growth and survival of plants. Acid rain affects agriculture by the way how it alters the composition of the soil. It causes respiratory issues in animals and humans.
- When acid rain falls down and flows into the rivers and ponds it affects the aquatic ecosystem. As it alters the chemical composition of the water, to a form which is actually harmful to the aquatic ecosystem to survive and causes water pollution.
- Acid rain also causes the corrosion of water pipes. Which further results in leaching of heavy metals such as iron, lead and copper into drinking water.
- It damages the buildings and monuments made up of stones and metals.

1.3 OZONE LAYER DEPLETION:

The ozone layer is a layer in Earth's atmosphere which contains relatively high concentrations of ozone (O3). This layer absorbs 93-99% of the sun's high frequency ultraviolet light, which is potentially damaging to life on earth. Over 91% of the ozone in Earth's atmosphere is present here. It is mainly located in the lower portion of the stratosphere from approximately 10 km to 50 km above Earth, though the thickness varies seasonally and geographically. The ozone layer was discovered in 1913 by the French physicists Charles Fabry and Henri Buisson.

The ozone layer in the stratosphere absorbs a portion of the radiation from the sun, preventing it from reaching the planet's surface. Most importantly, it absorbs the portion of UV light called UVB. UVB has been linked to many harmful effect, including skin cancers, cataracts, and harm to some crops and marine life.

Scientists have established records spanning several decades that detail normal ozone levels during natural cycles. Ozone concentrations in the atmosphere vary naturally with sunspots, seasons, and latitude. These processes are well understood and predictable. Each natural reduction in ozone levels has been followed by a recovery. Beginning in the 1970s, however, scientific evidence showed that the ozone shield was being depleted well beyond natural processes. Atmospheric concentrations of ozone vary naturally depending on temperature, weather, latitude and altitude, while substances ejected by natural events such as volcanic eruptions can also affect ozone levels. The "Dobson unit", a convenient measure of the total amount of ozone.

However, these natural phenomena could not explain the levels of depletion observed and scientific evidence revealed that certain man-made chemicals were the cause. These ozone-depleting substances were mostly introduced in the 1970s in a wide range of industrial and consumer applications, mainly refrigerators, air conditioners and fire extinguishers. When chlorine and bromine atoms come into contact with ozone in the stratosphere, they destroy ozone molecules. One chlorine atom can destroy over 100,000 ozone molecules before it is removed from the stratosphere. Ozone can be destroyed more quickly than it is naturally created. Some compounds release chlorine or bromine when they are exposed to intense UV light in the stratosphere. These compounds contribute to ozone depletion, and are called ozone-depleting substances and methyl bromide. Although ODS are emitted at the Earth's surface, they are eventually carried into the stratosphere in a process that can take as long as two to five years.

Ozone measurements fluctuate from day to day, season to season and one year to the next. Ozone concentrations are normally higher in the spring and lowest in the fall. In spite of these fluctuations, scientists have determined, based on data collected since the 1950's, which ozone levels were relatively stable until the late 1970's. Observations of an Antarctic ozone "hole"[1] and atmospheric records indicating seasonal declines in global ozone levels provide strong evidence that global ozone depletion is occurring.

Severe depletion over the Antarctic has been occurring since 1979 and a general downturn in global ozone levels has been observed since the early 1980's. The ozone hole over the Antarctic reached record proportions in the spring of 2000 at 28.3 million square kilometers and vertical profiles from stations near the South Pole showed complete ozone destruction in the lower stratosphere. Ozone decreases of as much as 70% have been observed on a few days.

2.1 WILDLIFE PROTECTION ACT, 1972

An Act to provide for the protection of wild animals, birds and plants and for matters connected therewith or ancillary or incidental thereto with a view to ensuring the ecological and environmental security of the country.

The rapid decline of India's wild animals and birds, one of the richest and most varied in the world, has been a cause of grave concern. Some wild animals and birds have already become extinct in this country and others are in the danger of being so. Areas which were once teeming with wild life have become devoid of it and even in Sanctuaries and National Parks the protection afforded to wild life needs to be improved. The Wild Birds and Animals Protection Act, 1912 (8 of 1912), has become completely outmoded. The existing State laws are not only out-dated but provide punishments which are not commensurate with the offence and the financial benefits which accrue from poaching and trade in wild life produce. Further such laws mainly relate to control of hunting and do not emphasis the other factors which are also prima reasons for the decline of India's wild life, namely, taxidermy and trade in wild life and products derived there from.

The Bill seeks to-

(a) Constitute a Wild Life Advisory Board for each State;

(b) Regulate hunting of wild animals and birds;

(c) Lay down the procedure for declaring areas as Sanctuaries, National Parks, etc.;

(d) Regulate possession, acquisition or transfer of, or trade in wild animals, animal articles and trophies and taxidermy thereof;

(e) Provide penalties for contravention of the Act.

2.2 FOREST CONSERVATION ACT, 1980

An Act to provide for the conservation of forests and for matters connected therewith or ancillary or incidental thereto. Forest (Conservation) Act, 1980 is a unique piece of legislation, and a regulatory mechanism that reflects the collective will of the nation to protect its rich biodiversity and natural heritage and that permits only unavoidable use of forest land for various developmental purposes. It embodies the firm commitment of the Government of India to balance the conservation of forests with the sustainable development need of the country contributing to better environment, health and economy. The remarkable feature of this Act is that it is regulatory and not prohibitory. Concurrent to regulated forest land diversions, the Government of India in the Ministry of Environment and Forests has also made efforts to consolidate the forest area and regenerate the forest cover through compensatory afforestation process.

Objectives

1. Forest dwellers must have access to subsidized sources of fuel, fodder, building material etc so that they do not cut trees.
2. Modify working plans into environmentally sound action plans based on scientific research.

    1. Protection of standing Forests.
    2. Creation of new stock.
    3. Building up of information base.

Measures

1. Aquatint yourself with the laws, detailed rules and orders issued by the government.
2. Create awareness about the existence & value of national parts & sanctuaries.
3. Help to create public pressure to change rules, laws & procedures when necessary.
4. Do not litter in a forest area.

5. Participate in preservation of greenery, by planting watering & caring for plants.

2.3 Water (Prevention and Control of Pollution) Act, 1974

An Act to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution, for conferring on and assigning to such Boards powers and functions relating thereto and for matters connected therewith. WHEREAS it is expedient to provide for the prevention and control of water pollution and the maintaining or restoring of wholesomeness of water, for the establishment, with a view to carrying out the purposes aforesaid, of Boards for the prevention and control of water pollution and for conferring on and assigning to such Boards powers and functions relating thereto.

The government formulated this act in 1974 to prevent the pollution of water by industrial, agricultural and household wastewater that can contaminate our water sources. Wastewaters with high levels of pollutants that enter wetlands, rivers, lakes, wells as well as the sea are serious health hazards. The main objectives of the Water Act are to provide for prevention, control and abatement of water pollution and the maintenance or restoration of the wholesomeness of water. It is designed to assess pollution levels and punish polluters. The Central Government and State Government have set up PCBs to monitor water pollution.

Controlling the point sources by monitoring the levels of different pollutants is one way to prevent pollution, by punishing the polluter. Individuals can also do several things to reduce water pollution such as using biodegradable chemicals for household use, reducing the use of pesticides in gardens, and identifying polluting sources at work places and in industrial units where oil are or other petroleum products and heavy metals are used. Excessive organic matter, sediments and infecting organism from hospital wastes can also pollute our water. Citizen needs

to develop a watchdog force to inform authorities to appropriate actions against different types of water pollution. However, preventing pollution is better than trying to cure the problems it has created, or punishing offenders.

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The Water Act, 1974 with certain amendments in 1978 is an extensive legislation with more than sixty sections for the prevention and control of water pollution. Among other things, the Act provides for constitution of central and State Boards for preventing water pollution, power to take water samples and their analysis, discharge of sewage or trade effluents, appeals, revision, minimum and maximum penalties, publication of names of offenders, offences by companies and Government departments, cognizance of offences, water laboratories, analysis etc.

2.4 THE ENVIRONMENT PROTECTION ACT, 1986

An Act to provide for the protection and improvement of environment and for matters connected there with: WHEREAS the decisions were taken at the United Nations Conference on the Human Environment held at Stockholm in June, 1972, in which India participated, to take appropriate steps for the protection and improvement of human environment; AND WHEREAS it is considered necessary further to implement the decisions aforesaid in so far as they relate to the protection and improvement of environment and the prevention of hazards to human beings, other living creatures, plants and property.

It was enacted with the main objective to provide the protection and improvement of environment and for matters connected therewith. The Act is one of the most comprehensive legislations with a pretext to protection and improvement of the environment.

The Constitution of India also provides for the protection of the environment. Article 48A of the Constitution specifies that the State shall endeavor to protect and improve the environment and to safeguard the forests and wildlife of the country. Article 51 A further provides that every citizen shall protect the environment.

Objectives

As mentioned earlier, the main objective of the Act was to provide the protection and improvement of environment and for matters connected therewith. Other objectives of the implementation of the EPA are:

- To implement the decisions made at the UN Conference on Human Environment held at Stockholm in June 1972.
- To enact a general law on the areas of environmental protection which were left uncovered by existing laws. The existing laws were more specific in nature and concentrated on a more specific type of pollution and specific categories of hazardous substances rather than on general problems that chiefly caused major environmental hazards.
- To co-ordinate activities of the various regulatory agencies under the existing laws
- To provide for the creation of an authority or authorities for environmental protection
- To provide deterrent punishment to those who endanger the human environment, safety and health

It is the power vested in the central government that they can take any reasonable and valid steps and measures for the purpose of the protection and improvement of the quality of the environment. These measures are taken for the prevention, control and abatement of environmental Pollution.

2.5 BIODIVERSITY ACT, 2002

An Act to provide for conservation of biological diversity, sustainable use of its components and fair and equitable sharing of the benefits arising out of the use of biological resources, knowledge and for matters connected therewith or incidental thereto. WHEREAS India is rich in biological diversity and associated traditional and contemporary knowledge system relating thereto. AND WHEREAS India is a party to the United Nations Convention on Biological Diversity signed at Rio de Janeiro on the 5th day of June, 1992. Biodiversity has been defined under Section 2(b) of the Act as "the variability among living organisms from all sources and the ecological complexes of which they are part, and includes diversity within species or between species and of ecosystems".

The Biological Diversity Act 2002 is a law meant to achieve three main objectives: the conservation of biodiversity; the sustainable use of biological resources; equity in sharing benefits from such use of resources. The Biological Diversity Act 2002 was born out of India's attempt to realize the objectives enshrined in the United Nations Convention on Biological Diversity (CBD) 1992 which recognizes the sovereign rights of states to use their own Biological Resources. The Act aims at the conservation of biological resources and associated knowledge as well as facilitating access to them in a sustainable manner and through a just process for purposes of implementing the objects of the Act it establishes the National Biodiversity Authority in Chennai.

Some salient features of the Act are: 1) To regulate access to biological resources of the country with equitable share in benefits arising out of the use of biological resources. 2) To conserve and sustainably use biological diversity. 3) To set up National Biodiversity Authority (NBA) , State Biodiversity Board (SBB) and Biodiversity Management Committees (BMC’s) 4) To create National , State and local biodiversity fund and its use for conservation of biodiversity. 5) To respect and protect knowledge of local communities and traditional knowledge related to biodiversity. 6) To conserve and develop areas of importance from the stand point of biological diversity by declaring them as biological diversity heritage sites.

3.1 MONTREAL PROTOCOL

The Montreal Protocol on Substances that Deplete the Ozone Layer (the Montreal Protocol) is an international agreement signed on 16th September 1987. It was designed to stop the production and import of ozone depleting substances and reduce their concentration in the atmosphere to help protect the earth's ozone layer.

The Montreal Protocol sits under the Vienna Convention for the Protection of the Ozone Layer (the Vienna Convention). The Vienna Convention was adopted in 1985 following international discussion of scientific discoveries in the 1970s and 1980s highlighting the adverse effect of human activity on ozone levels in the stratosphere and the discovery of the 'ozone hole'. Its objectives are to promote cooperation on the adverse effects of human activities on the ozone layer. The Montreal Protocol is widely considered as the most successful environment protection agreement. It sets out a mandatory timetable for the phase out of ozone depleting substances. The United Nations Industrial Development Organization (UNIDO) became an implementing agency of the Montreal Protocol in 1992 and is proud to be associated with its success. Since then UNIDO has recognized the significance of meeting the global environmental challenge of ozone depletion while observing national priorities, and of making meaningful technological adjustments resulting in a higher standard of living.

The Montreal Protocol has proven to be innovative and successful, and is the first treaty to achieve universal ratification by all countries in the world. Leveraging worldwide participation, the Montreal Protocol has sent clear signals to the global market and placed the ozone layer, which was in peril, on a path to repair. Full implementation of the Montreal Protocol is expected to result in avoidance of more than 280 million cases of skin cancer, approximately 1.6 million skin cancer deaths, and more than 45 million cases of cataracts in the United States alone by the end of the century, with even greater benefits worldwide. The Montreal Protocol's Scientific Assessment Panel estimates that with implementation of the Montreal Protocol we can expect near complete recovery of the ozone layer by the middle of the 21st century.

3.2 KYOTO PROTOCOL

The Kyoto Protocol was adopted on 11 December 1997. Owing to a complex ratification process, it entered into force on 16 February 2005. Currently, there are 192 Parties to the Kyoto Protocol.

The Kyoto Protocol is an international agreement that aimed to reduce carbon dioxide (CO_2) emissions and the presence of greenhouse gases (GHG) in the atmosphere. The essential tenet of the Kyoto Protocol was that industrialized nations needed to lessen the amount of their CO_2 emissions. The Protocol was adopted in Kyoto, Japan in 1997, when greenhouse gases were rapidly threatening our climate, life on the earth, and the planet, itself. Today, the Kyoto Protocol lives on in other forms and its issues are still being discussed. The Kyoto Protocol is significant because it introduces, for the first time, legally binding greenhouse gas emission commitments for the developed countries (this includes most of the developed countries listed in Annex I of the UNFCCC). The commitments agreed to should, according to the Protocol, lead to an overall global reduction of at least five per cent in 1990 levels of greenhouse gases by 2008-2012.

The most important greenhouse gas is carbon dioxide (CO_2), and its biggest source by far is the burning of fossil fuels (coal, oil and gas) for energy. Six billion tons of carbon is released as carbon dioxide every year from this source. Burning fossil fuels also gives off two other greenhouse gases: methane (CH_4) and nitrous oxide (N_2O). Carbon dioxide, methane and nitrous oxide are also given off as a result of deforestation, removal of grassland cover and agricultural practices. Deforestation is responsible for about 1.6 billion tons of carbon released as CO_2 per year. Methane is also emitted during the management and disposal of waste. Chlorofluorocarbons (CFCs), hydro chlorofluorocarbons (HCFCs) and halons are chemical gases which cause both ozone depletion and global warming. They are being phased out or controlled under the Montreal Protocol and so are not included in the UNFCCC or its Kyoto Protocol. The three industrial global warming gases controlled under the Kyoto Protocol are hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

3.3 Convention on Biological Diversity (CBD)

The Convention on Biological Diversity (CBD) is an international legally-binding treaty with three main goals: conservation of biodiversity; sustainable use of biodiversity; fair and equitable sharing of the benefits arising from the use of genetic resources. Its overall objective is to encourage actions, which will lead to a sustainable future. It was adopted at the Earth Summit, in Rio de Janeiro, in 1992.

One of the CBD's greatest achievements so far has been to generate an enormous amount of interest in biodiversity, both in developed and developing countries. Biodiversity is now seen as a critically important environment and development issue.

The Convention sets out general principles for action to achieve its main objectives: the conservation of biological diversity, the sustainable use of its components and the equitable sharing of benefits derived from the use of genetic resources. Over the years, the Conference of the Parties to the Convention—the body responsible for reviewing and guiding implementation—has adopted a number of programs of work on a range of thematic and cross-cutting issues. The thematic issues focus on the biodiversity of particular biomes or ecosystem types, such as marine and coastal areas, agricultural lands, dry lands, mountains, inland waters, and so forth. The cross-cutting issues are of a more general relevance and aim both to support the implementation of the thematic programmes of work and to implement specific articles of the Convention. The programs of work on access to genetic resources and benefit-sharing and indigenous and traditional knowledge fall into the latter category. The Conference of the Parties has also a number of tools and mechanisms to advance implementation of the Convention, such as operational guidance and principles for using the ecosystem approach and guidelines for incorporating biodiversity considerations into environmental impact assessment.