Module 5: Social Issues and The Environment

Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust, case studies, waste land reclamation, Consumerism and waste products, Environment Protection act, Air (Prevention and control of pollution) Act, Water (Prevention and control of pollution) Act, Wildlife protection act, forest conservation Act, Issues involved in enforcement of environmental legislation.

1. Climate Change

The average temperature in many regions has been increasing in recent decades. The global average surface temperature has increased by 0.6° + 0.2° C over the last century. Many countries have experienced increases in rainfall, particularly in the countries situated in the mid to high latitudes. Globally, 1998 was the warmest year. Projections of future climate change are derived from a series of experiments made by computer based global climate models. These are worked out on estimates of aspects such as future population growth and energy use. According, warming will be greatest over land areas, and at high altitudes. The frequency of weather extremes is likely to increase leading to floods or drought. Global mean sea level is projected to rise by 9 to 88 cm by the year 2100. More than half of the world's population now lives within 60 km of the sea.

1.1 Effects of climate change

- Human societies are seriously affected by extremes of climate such as droughts and floods.
- This is often a major concern for human health. To a large extent, public health depends on safe drinking water, sufficient food, secure shelter, and good social conditions. All these factors are affected by climate change.
- Fresh water supplies may be seriously affected, reducing the availability of clean water for drinking and washing during drought as well as floods.
- Water can be contaminated and sewage systems may be damaged.
- The risk of spread of infectious diseases such as diarrhea diseases increased.
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- The local reduction in food production would lead to starvation and malnutrition with long-term health consequences, especially for children.

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- Food and water shortages may lead to conflicts in vulnerable regions, with serious implications for public health.
- Climate change related impacts on human health could lead to displacement of a large number of people, creating environmental refugees and lead to further health issues.

2. Global warming

- About 75% of the solar energy reaching the Earth is absorbed on the earth's surface which increases its temperature.
- The rest of the heat radiates back to the atmosphere.
- Some of the heat is trapped by greenhouse gases, mostly carbon dioxide.
- As carbon dioxide is released by various human activities, it is rapidly increasing. This is causing global warming.
- The average surface temperature is about 15 $°C$. This is about 33 $°C$ higher than it would be in the absence of the greenhouse effect.
- Human activities during the last few decades of industrialisation and population growth have polluted the atmosphere to the extent that it has begun to seriously affect the climate.
- Carbon dioxide in the atmosphere has increased by 31% since pre-industrial times, causing more heat to be trapped in the lower atmosphere.

3. Acid rain

- When fossil fuels such as coal, oil and natural gas are burnt, chemicals like sulfur dioxide and nitrogen oxides are produced. These chemicals react with water and other chemicals in the air to form sulfuric acid, nitric acid and other harmful pollutants like sulfates and nitrates.
- These acid pollutants spread upwards into the atmosphere, and are carried by air currents, to finally return to the ground in the form of acid rain, fog or snow. The corrosive nature of acid rain causes many forms of environmental damage.

3.1 Effects:

- Acid rain dissolves and washes away nutrients in the soil which are needed by plants.
- Acid rain indirectly affects plants by removing nutrients from the soil in which they grow.
- Acid rain that falls or flows as ground water to reach rivers, lakes and wetlands, causes the water in them to become acidic. This affects plant and animal life in aquatic ecosystems.
- Acid rain also has far reached effects on wildlife. By adversely affecting one species, the entire food chain is disrupted, ultimately endangering the entire ecosystem.
- Acid rain and dry acid deposition damages buildings, automobiles, and other structures made of stone or metal.

3.2 Solutions:

- The best way to stop the formation of acid rain is to reduce the emissions of sulfur dioxide and nitrogen oxides into the atmosphere.
- This can be achieved by using less energy from fossil fuels in power plants, vehicles and industry. Switching to cleaner burning fuels is also a way out.

4. Ozone layer depletion

Ozone is formed by the action of sunlight on oxygen. It forms a layer 20 to 50 kms above the surface of the earth. This action takes place naturally in the atmosphere, but is very slow. Ozone is a highly poisonous gas with a strong odour. It is a form of oxygen that has three atoms in each molecule. It is considered a pollutant at ground level and constitutes a health hazard by causing respiratory ailments like asthma and bronchitis. It also causes harm to vegetation and leads to a deterioration of certain materials like plastic and rubber. Ozone in the upper atmosphere however, is vital to all life as it protects the earth from the sun's harmful ultraviolet radiation. The ozone layer in the upper atmosphere absorbs the sun's ultraviolet radiation, preventing it from reaching the earth's surface. This layer in the atmosphere protects life on earth from the dangerous UV radiation from the sun. Chlorofluorocarbons or CFCs, which were used as refrigerants and aerosol spray propellants, posed a threat to the ozone layer.

The CFC molecules are virtually indestructible until they reach the stratosphere, where UV radiation breaks them down to release chlorine atoms. The chlorine atoms react with ozone molecules which break down into oxygen molecules, which do not absorb UV radiations. Although the use of CFCs has been reduced and now banned in most countries, other chemicals and industrial compounds such as bromine, halocarbons and nitrous oxides from fertilizers may also attack the ozone layer.

4.1 Effects of ozone layer depletion

- The destruction of the ozone layer is seen to cause increased cases of skin cancer and cataracts.
- It also causes damage to certain crops and to plankton, thus affecting natures food chains and food webs. This in turn causes an increase in carbon dioxide due to the decrease in vegetation

5. Nuclear Accidents

- Nuclear energy was researched and discovered by man as a source of alternate energy which would be clean and cheap compared to fossil fuels
- A single nuclear accident can cause loss of life, long-term illness and destruction of property on a large scale for a long period of time.
- Radioactivity and radioactive fallout leads to cancer, genetic disorders and death in the affected area for decades after, thus affecting all forms of life for generations to come.

5.1 Nuclear holocaust:

- The use of nuclear energy in war has had devastating effects on man and earth.
- The Hiroshima and Nagasaki incident during World War II, the only use of nuclear power in war in history, is one of the worst disasters in history.
- In 1945, the United States dropped atomic bombs in Japan over the towns of Hiroshima and Nagasaki.
- These two atomic bombs killed thousands of people, left many thousands injured and devastated everything for miles around.
- The effects of the radiation from these nuclear bombs can still be seen today in the form of cancer and genetic mutations in the affected children and survivors of the incident.

6 CASE STUDY

i) Nuclear disasters and leakages

In 1986 the Nuclear Power Station at Chernobyl in USSR developed a problem that led to a fire and a number of explosions in its Nuclear Reactor. The radioactive dust spread over many kilometers and covered not only Europe but North America as well. Three people died in the explosion and 28 shortly after due to radiation exposure. Some 259 sick were hospitalized. As the area had to be evacuated 1,35,000 people had to be moved immediately and another 1.5 lac by 1991. As radioactive fall out continued even more people had to be moved. An estimated 6.5 lakh people may have been seriously affected. They may get cancer, thyroid tumours, and cataracts, and suffer from a lowered immune mechanism. As radioactivity passes from grass to herbivores, sheep in Scotland and Reindeer in Lapland were affected and were unfit for human consumption. Vegetable, fruit and milk were contaminated in Europe. A French Nuclear Waste Processing Center in Normandy may have affected the lives of children playing nearby. They may develop leukemia (blood cancer) in later life.

ii) The Narmada Issue

The controversy over the plan to build several dams on the Narmada River and its tributaries symbolizes the struggle for a just and equitable society in India. The construction of these dams displaces many poor and underprivileged communities, destroying their relatively self- sufficient environmentally sound economy and culture and reducing a proud people to the status of refugees or slum dwellers. The Narmada Bachao Andolan (Save the Narmada Movement) is one of the most dynamic people's movements fighting for the rights of these underprivileged people who are being robbed of their homes, livelihoods and way of living in the name of 'national interest'. One such dam, the SardarSarovar Dam, when completed will drown 37,000 hectares of fertile land and displace 200,000 adivasis and cause incomprehensible loss to the ecology.

iii) Silent Valley

The proposed Hydel project at Silent valley, a unique pocket of tropical biodiversity in South India, in the 1970s was stopped and the area declared a National Park in 1984. This was achieved by several dedicated individuals, groups and organisations lobbying to save the area from being submerged and protect its rich biodiversity. Among the many environmental battles that have been fought in this country some have been won while

many others have been lost. These projects have led to serious environmental degradation in spite of the laws intended to control such damage.

7. Wasteland reclamation

- Loss of vegetation cover leads to loss of soil through erosion, which ultimately creates wastelands.
- Loss of soil has already ruined a large amount of cultivable land in our country.
- Unless we adequately safeguard our 'good' lands, we may eventually face a serious shortage of food grains, vegetables, fruit, fodder and fuel wood.
- Hence, conservation of soil, protecting the existing cultivable land and reclaiming the already depleted wastelands figures prominently among the priority tasks of planning for the future.
- Wasteland can be classified into three forms: (1) Easily reclaimable, (2) Reclaimable with some difficulty, (3) Reclaimable with extreme difficulty.
- Easily reclaimable wastelands can be used for agricultural purposes.
- Those which can be reclaimed with some difficulty can be utilized for agro forestry.
- Wastelands that are reclaimed with extreme difficulty can be used for forestry or to recreate natural ecosystems.

Agriculture:

Wasteland can be reclaimed for agriculture by reducing the salt content which can be done by reducing salt content and adding a Gypsum, urea, potash and compost are added before planting crops in such areas.

Agro forestry:

- This involves putting land to multiple uses. Its main purpose is to have trees and crops inter- and /or under planted to form an integrated system of biological production within a certain area. Thus, agro forestry implies integration of trees with agricultural crops or livestock management simultaneously.

Need for wasteland development:

- Wasteland development provides a source of income for the rural poor.

- It ensures a constant supply of fuel, fodder and timber for local use. It makes the soil fertile by preventing soil erosion and conserving moisture.
- The trees help in holding back moisture and reduce surface run off rates thus helping in the control of soil erosion.

Consumerism and waste products

Modern societies that are based on using large amounts of goods, especially those that are manufactured for one time use, are extremely wasteful. The increasing consumption of natural resources has lead to serious environmental problems around the world. Current consumption patterns are depleting non-renewable resources, poisoning and degrading ecosystems, and altering the natural processes on which life depends. The present pattern of consumption, especially in affluent societies, is mainly responsible for the high level of utilization of resources. People in the industrialized countries make up 20% of the world population but consume 80% of the world's resources and produce 80% of wastes. This is due to a pattern of economic development that ensures that people go on consuming even more than they actually need. India is rapidly moving into this unsustainable pattern of economic growth and development. The rich in such a society get richer often at the cost of the poor whose lives are not improved by the process of development. It is seen that today's consumption patterns are depleting natural resources at a rapid rate and widening the inequalities in consumption in different societies. Consumerism causes wasteful use of energy and material far beyond that needed for everyday living at a comfortable level. Money is not the only way to measure the cost of an item that we use. When one adds up all the raw material and energy that goes into the manufacture of goods or the services provided by nature that one uses during a day's activities, the toll on the environment is large. When this cost is multiplied over a lifespan, the amount is staggering. If one considered the over utilisation in each family, city or a country, the impacts are incredibly high. For example: two hundred billion cans, bottles, plastic cartons and paper cups, are thrown away each year in the "developed" world. "Disposable" items greatly increase this waste. Rather than compete on quality or reliability, many industrial consumer products are made for one-time use. Buying quality products that are warranteed against failure or wearing out, learning about the raw materials that things are made of, and an appreciation of their origin from nature's storehouse, as well as knowing the conditions of the workers that make them, are some ways of resisting consumerism and decreasing waste.

8. The environment protection act

- Passed in March 1986, it came into force on 19 November, 1986.
- It has 26 sections. The purpose of the Act is improvement of the human environment and the prevention of hazards to human beings, other living creatures, plants and property.
- The spirit of the proclamation adopted by the United Nations Conference on Human Environment was implemented by the Government of India by creating this act.
- The act was amended in 1991

The main features of the act are

1. The central government shall have the power to take all such measure as it deems necessary or useful for the purpose of protecting and improving the quality of the environment and preventing, controlling and decreasing environmental pollution
2. No person carrying on any industry, operation or processes shall discharge or emit any environmental pollutants or permit to do so in excess of such standards as may be prescribed
3. No person shall handle or cause to be handled any hazardous substances except in accordance with such procedure and after complying with such safeguards as may be prescribed
4. The central government or any officer empowered by it, shall have power to take, for the purpose of analysis, sample of air, water, soil or other substances from any premises, factory etc may be prescribed
5. Whoever fails to comply with or violate any of the provisions of this act or the rules made or orders or directions issued there under shall in respect of each failure or violation be punishable with imprisonment or with fine or both

Air (prevention and control of pollution) act

- The Government passed this Act in 1981 to clean up our air by controlling pollution.
- The main objectives of the Act are as follows:

(a) To provide for the Prevention, Control and abatement of air pollution.

(b) To provide for the establishment of Central and State Boards with a view to implement the Act.

(c) To confer on the Boards the powers to implement the provisions of the Act and assign to the Boards functions relating to pollution.

- The presence of pollution beyond certain limits due to various pollutants discharged through industrial emission are monitored by the Pollution Control Boards set up in every State.

Central Board:

- The main function of the Central Board is to implement legislation created to improve the quality of air and to prevent and control air pollution in the country.
- The Board advises the Central Government on matters concerning the improvement of air quality and also coordinates activities, provides technical assistance and guidance to State Boards and lays down standards for the quality of air.

State Boards:

- The State Boards have the power to advice the State Government on any matter concerning the prevention and control of air pollution.
- They inspect air pollution control areas at intervals or whenever necessary. They are empowered to provide standards for emissions to be laid down for different industrial plants with regard to quantity and composition of emission of air pollutants into the atmosphere.
- A State Board may establish or recognize a laboratory to perform this function.
- The State Governments have been given powers to declare air pollution control areas after consulting with the State Board and also give instructions for ensuring standards of emission from automobiles and restriction on use of certain industrial plants.
- Penalties: Persons managing industry are to be penalized if they produce emissions of air pollutants in excess of the standards laid down by the State Board.
- The Board also makes applications to the court for restraining persons causing air pollution.

9. The water (prevention and control of pollution) act

- The Government has formulated this Act in 1974 to be able to prevent pollution of water by industrial, agricultural and household wastewater that can contaminate our water sources.
- The main objectives of the Water Act are to provide for prevention, control and abatement of water pollution and the maintenance or restoration of water.
- It is designed to assess pollution levels and punish polluters.
- The Central Government and State Governments have set up Pollution Control Boards that monitor water pollution.

Salient features

- The also aims at restoration of wholesomeness of water
- The water act is designed to assess pollution levels and punish polluters
- The central government and state governments have setup pollution control boards to monitor water pollution
- The water act of 1974 along with amendments in 1978 is an extensive legislation with more than sixty sections for prevention and control of water pollutions
- Central and state boards have been created under this act for preventing water pollution
- The act empowers the board to take

- Water samples for analysis
- Govern discharge of sewage
- Trade effluents
- Study or inspect appeals
- Revision of policies

- Set minimum and maximum penalties
- Publication of names of offenders
- Offences by companies or government departments

- Establish or recognize water testing laboratories and standard procedures
- Prevention and control of water pollution is achieved through a permit or a consent administration procedure
- Discharging effluents is permitted by obtaining the consent of state water boards

Penalties

- Penalties are charged for acts that have caused pollution.

- This includes failing to furnish information required by the Board, or failing to inform the occurrence of any accident or other unforeseen act.
- An individual or organization that fails to comply with the directions given in the subsections of the law can be convicted or punished with imprisonment for a term of three months or with a fine of Rs10,000 or both and in case failure continues an additional fine of Rs.5,000 everyday.
- If a person who has already been convicted for any offence is found guilty of the same offence again, he/she after the second and every subsequent conviction, would be punishable with imprisonment for a term not less than two years but which may extend to seven years with fine.

10. The wildlife protection act

The wild life act is aimed at preserving and protecting wildlife and came into effect in 1972

Salient features

- This act envisages national parks and wildlife sanctuaries as protected areas to conserve wildlife
- Under this act, wildlife populations are regularly monitored and management strategies are formulated to protect them
- The act covers the rights of forest dwellers. The act permits restricted grazing in sanctuaries but prohibits the same in national parks. The act also prohibits collection of non-forest timber which might not harm the system
- The act provides a comprehensive list of endangered species and prohibits hunting of the same
- The act provides for setting up national parks, wildlife sanctuaries etc
- The act provides for constitution of central zoo authority
- The act imposes a ban on trade or commerce of commercial animals
- The act provides a legal power to officers to punish offenders
- Under the act, captive breeding programs for endangered species have been initiated

Penalties:

- The offence is punishable with imprisonment for a term which may extend to three years or with a fine of Rs 25,000 or with both.
- An offence committed in relation to any use of meat of any such animal or animal articles like a trophy, shall be punishable with imprisonment for a term not less than one year and may extend to six years and a fine of Rs 25,000.

- In the case of a second or subsequent offence of the same nature mentioned in this sub-section, the term of imprisonment may extend to six years and not less than two years with a penalty of Rs.10,000.

11. Forest conservation act

- To appreciate the importance of the Forest Conservation Act of 1980, which was amended in 1988.
- The Indian Forest Act of 1927 consolidated all the previous laws regarding forests that were passed before the 1920's.
- The Act gave the Government and Forest Department the power to create Reserved Forests, and the right to use Reserved Forests for Government use alone.
- It also created Protected Forests, in which the use of resources by local people was controlled. Some forests were also to be controlled by a village community, and these were called Village Forests.

The salient features of the act are as follows

- The state government has been empowered under this act to use the forests only for forestry purposes
- It makes provision for conservation of all types of forests and for this purpose there is an advisory committee which recommends funding for it to the central government
- Any illegal non forest activity within a forest area can be immediately stopped under this act
- Forest officers and their categories of the forests, namely reserved forests, village forests, protected forests and private forests

Reserved forests:

- These forests are under the direct supervision of the government and no public entry is allowed for collection of timber or grazing of cattle

Protected forests:

- These forests are looked after by the government, but the local people are allowed to collect fuel wood/ timber and graze their cattle without causing serious damage to the forests

Village forests:

- Reserved forests assigned to a village community are called village forests

Private protected forests:

- These forest lands refer to protected areas inside India whose land rights are owned by an individual or a corporation/ organization

Penalties

A person who commits any of the offences like felling of trees or strips off the bark or leaves from any tree or sets fire to such forests, or kindles a fire without taking precautions to prevent its spreading to any tree mentioned in the act, whether standing or felled, or fells any tree, drags timber, or permits cattle to damage any tree, shall be punishable with imprisonment for a term which may extend to six month or with a fine which may extend to Rs 500, or both

12 Issues involved in enforcement of environmental legislation

- Environmental legislation is evolved to protect our environment as a whole, our health, and the earth's resources.
- The presence of a legislation to protect air, water, soil, etc. does not necessarily mean that the problem is addressed.
- Once a legislation is made at the global, National or State level, it has to be implemented.
- For a successful environmental legislation to be implemented, there has to be an effective agency to collect relevant data, process it and pass it on to a law enforcement agency.
- If the law or rule is broken by an individual or institution, this has to be punished through the legal process.
- The interested concerned individual must file a Public Interest Litigation (PIL) for the protection of the environment. People need to keep an eye and inform the concerned and see to it that actions are taken against offenders

13 Environment Impact Assessment (EIA):

For all development projects, whether Government or Private, the MoEF requires an impact assessment done by a competent organisation. EIAs are expected to indicate what the likely impacts could be if the project is passed. The EIA must look into physical, biological and social parameters. The EIA must define what impact it would have on water, soil and air. It also requires that a list of flora and fauna identified in the region is documented and to

specify if there are any endangered species whose habitat or life could be adversely affected. The Ministry of Environment and Forests (MoEF) has identified a large number of projects that need clearance on environmental grounds. After the Environmental Protection Act of 1986 was passed, an EIA to get an environmental clearance for a project became mandatory. To get an environmental clearance the proposer of the project is expected to apply to the State Pollution Control Board. The PCB checks and confirms that the EIA can be initiated. The Agency that does the assessment submits a Report to the proposer. This may take several months. A Report of the Environmental Statement is forwarded to the MoEF, which is the impact assessment authority and grants the project clearance

Citizens actions and action groups:

- Individuals can take one or several possible actions when they observe offenders who for their own self-interest damage the environment for others living in the area.
- The person has the right to bring an environmental offence or nuisance to the attention of authorities.
- Educated individuals have rights as well as have an obligation to perform their duties.
- They can accompany activity groups to strengthen the ecology movements.