Sri SAI RAM ENGINEERING COLLEGE
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Sairam INSTITUTIONS

SAIRAM DIGITAL RESOURCES

YEAR II | SEM IV

GE8291

ENVIRONMENTAL SCIENCE AND ENGINEERING

UNIT NO 4

SOCIAL ISSUES AND THE ENVIRONMENT

- **Wasteland reclamation**
- **Consumerism and Waste products**
- **Environmental legislation and laws**

SCIENCE & HUMANITIES

4 QUALITY EDUCATION

4.4.1 Wasteland Reclamation

- Economically unproductive lands suffering from environmental deterioration are known as wastelands.
- The wastelands include salt-affected lands, sandy areas, gullied areas, snow covered areas, glacial areas, barren hill-ridge etc.
- Characteristics features of wasteland can be summarized as under:

1.The land becomes ecologically unstable and unproductive.

2. Land that has nearly or completely lost its topsoil.

3. Land that has developed toxicity in the zone of roots for the growth of most plants. National Wasteland Development Board (NWDB) aims at the reclamation and use of waste lands.

Type of waste lands

- **Uncultivable waste lands:** These lands cannot be brought under cultivation.

  Example: Barren rocky areas, hilly slopes, stony, sandy deserts

- **Cultivable wastelands:** These are cultivable but not cultivated for more than five years.Cultivable wastelands are important for agricultural purposes.

Examples: Degraded forest lands, gullied lands, water logged and marsh lands.

Causes of waste land formation

- Due to soil erosion ,deforestation, overgrazing, water logging salinity.
- The increasing demand for firewood and excessive use of pesticides.
- Developmental activities
- Over exploitation of natural resources.
- By the sewage and industrial wastes.
- Mining activities destroy the forest and cultivable land.
- Growing demands for fuel, fodder, wood and food cause degradation and loss of soil productivity.

Objectives of waste land reclamation

- To improve the physical structure and quality of the soil.
- To prevent soil erosion, flooding and landslides.
- To avoid over exploitation of natural resources.
- To improve the availability of good quality of water for agricultural purposes and industrial operation.
- To conserve the biological resources and natural ecosystem.
- To provide a source of income to the rural poor.
- To supply fuel,fodder and timber for local use.

Methods For Reclaiming Land

i) Land development and leaching:

- For reclamation of the salt affected soil, it is necessary to remove the salts from the root-zone which is usually achieved by leaching i.e. by applying excess amounts of water to push down the salts.
- Land after leveling and ploughing, the field is bunded in small plots and leaching is done.
- Continuous leaching for a few hours can remove 90% of soluble salts.

ii) Reclamation of waterlogged land:

- Drainage is required for water-logged land.

Methods For Reclaiming Land

(a)Surface drainage:

- This is used in areas where water stands on the fields after heavy rains by providing ditches to runoff the excess water.

(b)Subsurface drainage:

- Horizontal subsurface drainage is provided in the form of perforated corrugated PVC pipes with an envelope of gravel 2-3 m below the land surface.
- Chances of evaporation of water leading to accumulation of salts almost become nil in this method.

Methods For Reclaiming Land

iii) Irrigation Practices:

- Scientific irrigation practices can help in waste land recovery. Over-irrigation may lead to water-logging while under-irrigation may lead to desertification.

iv) Selection of tolerant crops and crop rotations:

- Tolerance of crops to salts is found to range from sensitive, semi-tolerant, tolerant to highly tolerant.
- Barley, sugar beet and date-palm are highly tolerant crops which do not suffer from any reduction in crop yield even at a high salinity. Wheat, pearl millet, soyabean, mustard and coconut are salt-tolerant crops. Rice, millets, maize, pulses, sunflower, sugarcane and many vegetables like bottle gourd, brinjal etc. are semi-tolerant.

Methods For Reclaiming Land

- These different crop combinations can be grown on saline soils.

v) Gypsum amendment:

- Amendment of high sodium soils with gypsum is recommended for reducing soil sodicity as calcium of gypsum replaces sodium from the exchangeable sites.

vi) Green-manures, fertilizers and biofertilizers:

- Application of farm yard manure or nitrogen fertilizers have been found to improve saline soils.
- Blue green algae have been found to be quite promising as biofertilizers for improving salt-affected soils.

Methods For Reclaiming Land

vii) Afforestation Programmes:

- The National Commission on Agriculture (NCA) launched several afforestation schemes to prevent the problem of spreading wasteland.
- The National Wasteland Development Board, in the Ministry of Environment and Forests has set a target of bringing 5 million of wasteland annually under firewood and fodder plantation.

viii) Social Forestry Programmes:

- These programmes mostly involve strip plantation on road, rail and canal-sides, rehabilitation of degraded forest lands, farm-forestry, waste-land forest development etc.

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4.4.2 CONSUMERISM AND WASTE PRODUCTS

- Consumerism refers to the consumption of resources by the people.
- Two types of conditions of population and consumerism exist.

Traditionally favourable rights of sellers:

- The right to introduce any product.
- The right to charge any price.
- The right to spend any amount to promote their product.
- The right to use incentives to promote their products.

Traditional buyers rights:

- The right to buy or not to buy.
- The right to expect a product to be safe.
- The right to expect the product to perform as claimed.

CONSUMERISM

Important informations to be known by buyers:

- Ingredients of a product.
- Manufacturing date and expiry date.
- Whether the product has been manufactured against an established law of nature or involved in rights violation.

Objectives of Consumerism:

- It improves the rights and powers of the buyers.
- It involves making the manufacturer liable for the entire life cycle of a product.
- It forces the manufacturer to reuse and recycle the product after usage.

CONSUMERISM

- The items which are very difficult to decompose like polymeric goods, computers, television etc. can be returned to the manufacturer for reclaiming useful parts and disposing the rest.
- The reusable packing materials like bottles can be taken back to the manufacturer. It makes the products cheaper and avoids littering and pollutions
- Active consumerism improves human health and happiness and also it saves resources.

CONSUMERISM

Sources of Wastes:

The sources of the waste materials are agriculture, mining, industrial and municipal wastes.

Examples

It includes glass, papers, garbage, plastics, mobile phones etc.

E- waste

Electronic equipment like computers, printers, mobile phones, xerox machines, calculators etc. After using these instruments they are thrown as waste.

WASTE PRODUCTS

Effects of wastes:

- The waste released from chemical industries and from explosives are dangerous to human life.
- The dumped wastes degrade soil and make it unfit for irrigation.
- E-waste contains more than 1000 chemicals, which are toxic and cause environmental pollution. In computers lead is present in monitors, cadmium in chips and cathode ray tube, PVC in cables.
- All these cause cancer and other respiratory problems if ed for long periods.
- Plastics are difficult to recycle,are non-biodegradable and their combustion produces several toxic gases.

Factors affecting consumerism and generation of wastes

(i) People overpopulation:

- It occurs when there are more people than available supplies of food, water and other important resources in the area.
- Excessive population pressure causes degradation of the limited resources, and there is absolute poverty, under-nourishment and premature deaths.
- This occurs in less developed countries (LDCs). Here due to the large number of people, adequate resources are not available for all.
- So there is less per capita consumption although overall consumption is high.

Factors affecting consumerism and generation of wastes

(ii) Consumption overpopulation:

- This occurs in the more developed countries (MDCs).
- Here population size is smaller while resources are in abundance and due to luxurious life-style per capita consumption of resources is very high.
- More the consumption of resources more is the waste generation and greater is the degradation of the environment.
- In LDCs - No. of people is very high, but per capita use of resources and waste generated are less. In MDC's - No. of people is low, but per capita use of resources and wastes generated are very high. On an average, a U.S. citizen consumes 50 times as much as an Indian.

4.4.3 Environment legislation and laws

Environmental management requires a strong legal framework in order to protect our valuable environment from the sources which are causing severe environmental pollution. The major environmental problems around us are,

- Air and water pollution by industries.
- Forestry
- Land resources
- Waste management
- Urbanization

The Environmental protection act, 1986

Objectives of environmental act:

- To protect and improve the environment.
- To prevent hazards to all living creatures and property.
- To maintain harmonious relationships between humans and their environment.

Important features of Environment Act:

- Subject to the provisions of this Act, the Central Government shall have the power to take all measures, as it deems necessary or expedient for the purpose of protecting and improving the quality of the environment.

The Environmental protection act, 1986

- Planning and execution of a nationwide program for the prevention, control and abatement of environmental pollution.
- Laying down standards for the quality of the environment in its various aspects.
- Laying down standards for emission or discharge of environmental pollutants from various sources.
- Restriction of areas in which any industries, operations or processes or class of industries, operations or processes shall not be carried out or shall be carried out subject to certain safeguards.
- Laying down procedures and safeguards for the handling of hazardous substances.

The Environmental protection act, 1986

- Carrying out and sponsoring investigations and research relating to problems of environmental pollution;
- Inspection of any premises, plant, equipment, machinery, manufacturing or other processes, materials or substances and giving, by order, of such directions touch authorities, officers or persons as if may consider necessary to take steps for the prevention, control and abatement of environmental pollution.
- Preparation of manuals, codes or guides relating to the prevention, control and abatement of environmental pollution.

The Air (Prevention And Control of Pollution) Act, 1981

- According to this act, air pollution has been defined as the presence of any solid, liquid or gaseous substance (including noise) in the atmosphere in such concentration as may be or tend to be harmful to human beings or any other living creatures or plants or property or environment.

The main objectives of the Act are as follows:

- To provide for the Prevention, Control and abatement of air pollution.
- To provide for the establishment of Central and State Boards with a view to implement the Act.
- To confer on the Boards the powers to implement the provisions of the Act and assign to the Boards functions relating to pollution.

The Air (Prevention And Control of Pollution) Act, 1981

Important features of Air Act:

Central Pollution Control Board (CPCB):

- It advises the central govt. in matters related to prevention and control of air pollution.
- Coordinates the activities of State Pollution Control Boards and provides them technical assistance and guidance.
- Organizes training programs for prevention and control of air pollution.
- Organizes comprehensive programs on pollution related issues through mass media.

The Air (Prevention And Control of Pollution) Act, 1981

- Collects, compiles and publishes technical and statistical data related to pollution.
- Plans nationwide programs for prevention, control or abatement of pollution.

State Pollution Control Boards (SPCB):

- State govt. is empowered to issue instructions to the authority in charge of registration of motor vehicles (under Motor Vehicles Act, 1939) that is bound to comply with ensuring emission standards from automobiles.
- 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.

The Air (Prevention And Control of Pollution) Act, 1981

- Violation of law is punishable with imprisonment for a team which may extend to three months or fine up to Rupees ten thousand or both.

The Water (Prevention And Control of Pollution) Act, 1974

- It provides for maintaining and restoring the wholesomeness of water by preventing and controlling its pollution.
- Pollution is defined as such contamination of water, or such alteration of the physical, chemical or biological properties of water, or such discharge as is likely to cause a nuisance or render the water harmful or injurious to public health and safety or harmful for any other use or to aquatic plants and other organisms or animal life.

The Water (Prevention And Control of Pollution) Act, 1974

Objectives of the water act:

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

The salient features and provisions of the Act are the following:

- It provides for maintenance and restoration of quality of all types of surface and groundwater.
- It provides for the establishment of Central and State Boards for pollution control.

The Water (Prevention And Control of Pollution) Act, 1974

- It confers them with powers and functions to control pollution.
- The Central and State Pollution Control Boards are widely represented and are given comprehensive powers to advise, coordinate and provide technical assistance for prevention and control of pollution of water.
- The Act has provisions for funds, budgets, accounts and audit of the Central and State Pollution Control Boards.
- The Act makes provisions for various penalties for the defaulters and procedure for the same. The main regulatory bodies are the Pollution Control Boards, which have been, conferred the following duties and powers.

The Water (Prevention And Control of Pollution) Act, 1974

Central Pollution Control Board (CPCB):

- It advises the central government in matters related to prevention and control of water pollution.
- Coordinates the activities of State Pollution Control Boards and provides them technical assistance and guidance.
- Organizes training programs for prevention and control of pollution.
- Organizes comprehensive programs on pollution related issues through mass media.
- Collects, compiles and publishes technical and statistical data related to pollution.

The Water (Prevention And Control of Pollution) Act, 1974

- Prepares manuals for treatment and disposal of sewage and trade effluents.
- Lays down standards for water quality parameters.
- Plans nation-wide programs for prevention, control or abatement of pollution.
- Establishes and recognizes laboratories for analysis of water, sewage or trade effluent samples.

State Pollution Control Board:

- The Board advises the state government with respect to the location of any industry that might pollute a stream or a well.

The Water (Prevention And Control of Pollution) Act, 1974

- 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 lab.
- If the samples do not conform to the prescribed water quality standards (crossing maximum permissible limits), then consent is refused to the unit.

The Wildlife Protection Act, 1972

- This Act passed in 1972, clearly states and explains each and every term very precisely like animal, habitat, hunting, license, national park, sanctuary, wild animal, wildlife etc.
- It is aimed to protect and preserve wildlife. India has rich wildlife heritage. It has 350 species of mammals,1200 species of birds and about 20,000 known species of insects.
- Some of them are listed as endangered species in the wildlife. Wildlife is an integral part of our ecology and plays an essential role in its functioning.
- The wildlife is declining due to human actions, the wildlife products have decimated the population of many species.

The Wildlife Protection Act, 1972

Objectives of the wildlife act:

- To maintain essential ecological processes and life supporting systems.
- To preserve biodiversity
- To ensure a continuous use of species.

Important features:

- It provides for the appointment of 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 the endangered species was mentioned.

The Wildlife Protection Act, 1972

- The Act provides for setting up of National Parks, Wildlife Sanctuaries etc.
- The Act provides for the constitution of the Central Zoo Authority.
- There is provision for trade and commerce in some wildlife species with license for sale, possession, transfer etc.
- The Act imposes a ban on the trade or commerce in scheduled animals.
- It provides for legal powers to officers and punishment to offenders.
- It provides a captive breeding program for endangered species.

Penalties:

- A person who breaks any of the conditions of any license or permit granted under this Act shall be treated guilty.

The Wildlife Protection Act, 1972

- 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 animal specified in Schedule I, or Part II of Schedule II, like the 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.

Forest (Conservation) Act 1980

- This act provides conservation of forests and related aspects.
- This act also covers all types of forests including reserved forests, protected forests and any forested land. This Act was enacted in 1980. It aims to arrest deforestation.

Forest (Conservation) Act 1980

Objectives of forest act:

- To protect and conserve the forest.
- To ensure judicious use of forest products.

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.
- If at all it wants to use it in any other way,it has to take prior approval of central Government, after which it can pass orders for declaring some part of reserve forest for non-forest purposes (e.g mining) or for clearing naturally growing trees and replacing them by economically important trees.

Forest (Conservation) Act 1980

- 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.
- Non-forest activities include clearing of forest land for cultivation of any type of plants/crops or any other purpose (except reafforestation).
- However, some construction work in the forest for wildlife or forest management is exempted from non-forest activity (e.g. fencing, making water-holes, trench, pipelines, check posts, wireless communication etc.)

Forest (Conservation) Act 1980

Important features of Amendment Act of 1988.

- Forest departments are forbidden to assign any forest land by way of lease or otherwise to any private person or non government body for reafforestation.
- Clearance of any forest land of naturally grown trees for the purpose of reafforestation is forbidden.
- The diversion of forest land for non forest uses in cognisable offence and any one who violates the law is punishable

Penalties for offences in Reserved Forests: No person is allowed to make clearings or set fire to a Reserved Forest. Cattle are not permitted to trespass into the Reserved Forest. Felling, collecting of timber, bark or leaves, quarries or collecting any forest product is punishable with imprisonment for a term of six months, or with a fine which may extend to Rs.500, or both.

Forest (Conservation) Act 1980

Penalties for offences in Protected Forests:

- A person who commits any of the following 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 of with a fine which may extend to Rs.500, or both.

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THANK YOU