UNIT-4

SOCIAL ISSUES AND THE ENVIRONMENT

4.1 FROM UNSUSTAINABLE TO SUSTAINABLE DEVELOPMENT

Development and environment both are twins of science. Now-a-days human beings cannot live without the developmental activities for meeting their needs.

Sustainable development:

It is defined as "development that meets the needs of present without compromising the ability of future generation to meet their own needs".

Dimensions of sustainable development

Sustainable development is the multi dimensional concept aiming at benefits derived from the interactions between society, economic and environment.

Aspects of sustainable development

1. Inter generational equity:

It states that we should handover a safe, healthy and resourceful environment to our future generations.

2. Intra generational equity

It states that the technological development of rich countries should support the economic growth of the poor countries and help in narrowing the wealth gap and lead to sustainability

Important components of Sustainable development:

1. Economic development

2. Community development

3. Environmental protection

Measures for sustainable development:

Population control:

Population should be limited and this is one of the major component of sustainable development

Water resource management:

Flooding, over exploitation of ground water, poor drainage, pollution of the water bodies are some of the factors of poor water resources management

Reduced consumption:

Consumption of water, energy, air and other natural resources should be limited

Renewable resources: Solar energy is an ideal energy. It will not be reduced in the future

Biosphere conservation: Protect the environment from pollution, destruction of natural resources and poaching of animals

Pollution control:

Pollution of water, air and soil are a major threat for future mankind. Government rules, policy enforce the people to reduce the pollution

Reduce Reuse and Recycle (3R approach) –Optimum use of natural resources using it again and again instead of throwing it on wasteland or water and recycling the material in to further products. It reduces waste generation and pollution**.**

4.2 URBAN PROBLEMS RELATED TO ENERGY

URBANIZATION

Urbanization is the movement of human population from rural areas to urban areas for the want of better education, communication, health, employment etc

Causes of urbanization

Cities are the main centers of economic growth, trade, transportation, education, medical facilities and employment, so that rural people moves to cities

Urban sprawl:

About 50% of the world population lives in urban area and people from rural area is moving to cities for employment. Thus the urban growth is so fast and it is difficult to

accommodate all the commercial, industrial, residential and educational facilities within a limited area .as a result there is spreading of the cities into sub urban or rural areas. This phenomenon is known as urban sprawl

Examples for energy demanding activities:

Residential and commercial lightings

Transportation

Industries using a large proportion of energy

Modern lifestyle using a large number of electrical gadgets (fan, washing machine, A/C, water heater) in everyday life

Control and prevention of pollution need more energy demanded technologies

Solutions for urban energy problem

Urban people may use public transport instead of using motor cycles and cars

Energy consumption must be minimized in all aspects

Production capacity may be increased

Use of energy efficient technology

Using solar energy and wind energy

Imposing strict laws

4.3 WATER CONSERVATION

The original source of water is precipitation from the atmosphere. The water available on the earth may occur in all three stages as gas, liquid or solid. Temperature is the main factor in deciding the state of water. As a liquid, the water forms hydrosphere. About 75% of the Earth's surface is covered by the hydrosphere.

The process of saving water for future utilization is known as water conservation

Need for water conservation

Better lifestyle require more fresh water

As the population increases, the requirement of water is also increases

Due to deforestation, the annual rain fall is also decreasing

Over exploitation of ground water, leads to drought

Agricultural and industrial activities require more fresh water

Strategies (measures) of water conservation:

1.Reducing evaporation losses

Evaporation of water in humid region can be reduced by placing horizontal batteries of asphalt below the soil surface which increase the water availability and crop yield.

2.Reducing irrigation losses-

The water losses during irrigation can be reduced by the following methods

sprinkling and dripping irrigation conserves water by 30-40%.

Irrigation in early morning or later evening reduces Evaporation losses.

3.Reuse of water:

Treated waste water can also be used for ferti-irrigation

4.Preventing wastage of water

Closing the taps when not in use

Repairing any leakage from pipes

Using small capacity of pipes

5.Decreasing run off losses

Run off on most of the soils can be reduced by allowing most of the water to infiltrate in to the soil . This can be done by using contour cultivation .

6.Avoid discharge of sewage

The discharge of sewage in to natural water resources should be prvented as much as possible.

4.4 METHODS OF RAIN WATER HARVESTING

1. Rainwater harvesting
2. Watershed management

1.4.1 RAIN WATER HARVESTING

It is a technique of collecting and storing rain water for use in non-monsoon periods. For the purpose, rain water is collected at the roof top or in an open well and then carried down for immediate use or it is directed into the aquifer

Need (or) objectives of rainwater harvesting

To meet the increasing demands of water

To raise the water table by recharging the ground water

To reduce the surface runoff water

To reduce storm water runoff and soil erosion

To minimize the water crisis and water conflicts

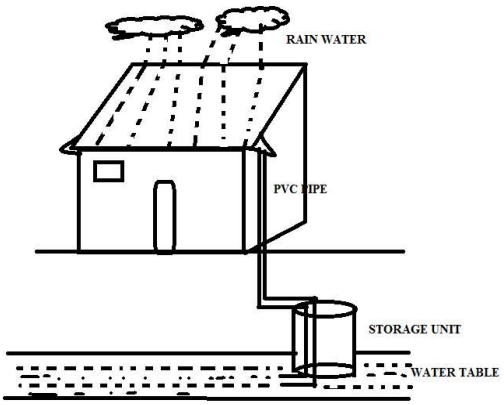
Concept of rain water harvesting:

Rain water harvesting involves collecting of water that falls on the roof of the house during rain storms and conveying it through PVC or aluminium pipe to a nearby covered storage unit. The rainwater yield varies with the size and texture of the catchement area.

Methods (or) types of rain water harvesting:

Roof top rain harvesting method:

It is the method of collecting rain water from the roof of the building and storing it in the ground for our future use. It is the low cost and effective technique for urban houses and buildings . The rain water from the top of the roofs, road surfaces, play grounds, open lands is diverted in to the surface tank (or) recharge pits through a delivery system which can be later used for several purposes. Also it can be used to recharge under ground aquifers by diverting the water from stored water to dug-well or borewells



Advantages of rain water harvesting:

Reduction in the use of current for pumping water

Increasing the availability of water from well

Rise in ground water level

It supports the future generation water needs

Minimizing the soil erosion and flood hazards

4.4.2 WATERSHED MANAGEMENT

Watershed is defined as the land area from which water drains under the influence of gravity into stream, lake, reservoir or other body of the surface water

Watershed management: the management of rainfall and resultant runoff is called watershed management

Factors Affecting Watershed.

a. Development of land eliminates these resources.

b. Overgrazing, deforestation, mining and construction activities.

c. Droughty climates.

d. Natural vegetation surfaces and soils.

Objectives of watershed management:

To minimize the risks of flood, drought and landslides

To develop the rural areas in the region with clear plan for improve the economy of the region

To manage the domestic water supply activity

To protect the soil from erosion by runoff

To raise the ground water level

Concept of Watershed:

Three essential zones are:

1. **Water body:**

Stream, river, pond, lake, estuary or ocean.

2. **Riparian:**

Non-cultivated, vegetated area between the water body edge and upland area.

3. Upland zones:

Land around a higher water mark.

The relationship between proper management and health including soil productivity , flood safety, water quality and production and wild life habitat protection if crucial.

Effective watershed management conserves and enhances the resources needs of people and their ecosystem.

Watershed management techniques

Trenches (pits):

Trenches were dug at equal interval to improve ground water storage

Earthen dam:

To check the runoff water, it must be constructed in the catchment area

Farm pond:

It cam neb built to improve water storage capacity of the catchment area

Underground barriers (dykes) :

It should be built along the nullahs to raise the water table.

Maintenance of watershed(or) components of integrated watershed management

a. Water harvesting:

Proper storage of water is done with provision for use in dry seasons in low rainfall areas. It also helps in moderation of floods. It plays a very important role. They help to prevent soil erosion and retention of moisture.

b.Afforestation and Agroforestry

It helps to prevent soil erosion and retention of moisture in watershed areas

c.Reducing soil erosion:

Terracing, bunding, contour cropping, strip cropping are used to minimize soil erosion on the slopes of watersheds

d.Public participation:

People involvement including the farmers and tribal's is the key to the success of any watershed management programme, particularly the soil and water conservation.

The communities are to be motivated for protecting a freshly planted area and maintaining a water harvesting structure implemented by government or NGO or by involving the local people.

Successful watershed management has been done at Sukhomajri Panchkula,Haryana through active participation of the local people.

e.Mechanical measures:

Mechanical measures like terracing, bunding, bench terracing, no-till farming, contour cropping, strip cropping etc; are used to minimize run-off and soil erosion particularly on the slopes of watershed.

National level system: Six regions are available

Region1: river falling into Arabian Sea

Region 2: Excluding Indus system

Region 3: rivers falling into Bay of Bengal, other than Ganga and Brahmaputra system

Region4: the Ganga system

Region5: the Brahmaputra system

Region6: Rajasthan system

4.5 RESETTLEMENT AND REHABILITATION OF PEOPLE PROBLEMS AND CONCERNS

Resettlement:

Resettlement is simple relocation or displacement of human population. This process does not focus on their future welfare, for e.g., repairing process, alteration of building

Rehabilitation:

Simple displacement or relocation of human population, this process focus on their future welfare, for e.g., repairing process, alteration of building

Causes of displacement of people:

1. Due to dams

India is one of the countries in the world leading in construction of big dams. In the last 50 years more than 20 million people have been directly or indirectly affected by these dams.

Eg.

a. Hirakud dam has replaced more than 20000 people residing in about 250 villages.

b. Bhakra Nangaldam was constructed during 1950's and till now it has not been possible to rehabilitate even half of the displaced persons.

2. Due to mining:

• Mining is another development activity, which causes displacement of the native people.

• Several thousands of hectares of land area is covered in mining operation and the native people are displaced.

Eg. Jharia coal fields

This coal fields have been posing to the local residents due to under ground fires. The people of Jharia are being asked to vacate the area, but till now there is no alternative land and rehabilitation package prepared.

3. Due to creation of national park:

• When a forest area is covered by a National Park it is a welcome step for conservation of the natural resources.

• A major portion of the forest is declared as covered area, where the entry of local dwellers or tribal's is prohibited.

• When these villagers are deprived of their ancestral right or access to the forest, they usually retaliate by starting destructive activities.

Eg. The Wayanad Wild life sanctuary in Kerala has caused displacement of 53,472 tribal families.

Rehabilitation issues:

The major issues are as follows:

a. Tribal's are usually the most affected amongst the displaced who are already poor. Displacement further increases their poverty due to loss of land, home, jobs,

loss of access to common property assets, increased morbidity and mortality and social isolation.

b. The tribal's are not familiar with the market politics and alienated in the modern economic set up.

c. Break up of families is an important social issue arising due to displacement in which the women are the worst affected and they are not even given cash or land compensation.

d. Loss of identity and loss of the intimate link between the people and the environment is one of the biggest losses.

e. Marriages, social, and cultural functions, their folk songs, dances and activities vanish with their displacement.

Resettlement Principle

Under such policy, a number of resettlement and rehabilitation principles have been developed for the Project.

(1) The resettlement plan will be based on detailed inventory for land acquisition and houses

Demolition, and adopted compensation standards and subsidies.

(2) The resettlement shall be combined with the local development, resource utilization and Economic growth as well as environment protection. Considering the local conditions, a Practical and feasible resettlement plan should be developed to restore or improve their Economic production and create basic conditions for long-term development.

(3) The resettlement plan should be based on the principle —Beneficial to the production and Convenient for living.

(4) The re-construction standard and scale shall be based with the principle of recovery to the original standard and original scale. Combining the local development, the cost for enlarging the scale, raising standard and future plan shall be solved independently by local government and relevant department.

(5) Making overall plans and taking all factors into consideration, correctly handling the relations between the state, collective and individual.

(6) Fully utilize local natural resource, build water conservancy facility, develop new farmland, improve land quality, and strengthen agricultural strength and make the resettler living standard reach or exceed the original level step by step.

(7) Resettlement Plan will include measures to improve basic livelihood and assist relocation and rehabilitation for those vulnerable persons and extremely poor individuals affected by the Project.

Resettlement and Rehabilitation programmes

a. Planning and identification of the population that is to be affected and resettled.
b. The extent of damage and suffering that the proposed project would cause should be studied and ascertained before starting the project.
c. The people should be rehabilitated on minimum dislocation basis by choosing adjacent areas.
d. Community formation and economic development.
e. The extent of rehabilitation should meet the ends of social justice and balance development.
f. Resettlement programme with sustainable development orientation

Case study:

Tehri dam project

The dam was constructed across the rivers Bhagirathi and bhilanganga, which close to the gashwal town of tehri.the dam would submerge nearby 100 villages, including Tehri, a historical village, in that incident 85,600 families were relocated

4.6 ENVIRONMENTAL ETHICS:

Ethic is a branch of philosophy

It deals with morals and values

It is also refers to the issues, principles and guidelines relating to human interactions with their environment

Functions of environment

It is a life supporting medium for all organisms

It moderates the climatic conditions of soil

Healthy economy depends on a healthy environment

Environmental problems:

a. Population growth and urbanization.
b. Deforestation and forest fire.
c. Discharge of effluent from industries.
d. Water scarcity due to inadequate rainfall.
e. Land degradation and soil erosion.
f. Over exploitation of natural resources.

Solutions to Environmental problems:

1. Over exploitation of biodiversity and resources must be reduced.
2. Reduction, reduce and reuse of waste products and energy resources.
3. Pollution free disposal of hazardous waste materials.
4. Any environmental impacts of human activities must be assessed by efficient ecologist.
5. Science and technology used to changing life from unbalanced to balanced state.
6. Sustainable development is essential on conservation of resources.
7. Reduce population growth and increase the economic growth of our country.

Ethical guidelines on environmental protection:

1. The earth is the habitat of all living species and not of human beings alone.

2. Natural resources and energies are depleting fast. We must protect them.

3. Involve yourself in the care of the earth and experience nature.

4. Respect nature, you are a part of it.

5. Think of the global cause and act for local protection

6. Keep yourself informed about ecological changes and developments.

7. Observe austerity, reserve scarce resources for the future and the future generations.

8. We must be cooperative, honest, affectionate and polite to society and nature.

4.7 NUCLEAR ACCIDENTS AND HOLOCAUST

Nuclear energy and accidents

The most serious hazards to human and environmental health from the nuclear accident is the release of large amount of nuclear energy and radioactive products into the atmosphere

Type's of nuclear accidents

1. Nuclear test;

Nuclear explosion is carried in under ground, cause settling down the radio active materials on the earth's surface and radioactive particles, radioactive rays into the atmosphere.

2. Nuclear power plant:

The release of radiations occur during the accidents. The nuclear power plant located in the seismic vulnerable area may cause nuclear accidents.

3. Improper disposal of radioactive waste:

It is the another source of accidents. Drums stored underground can rust and leak radioactive materials into water, land air.

4. Accident during transport:

Trucks carrying radioactive wastes or fuels are involved in frequent accidents.

5. Core melt down:

The major accidents at a nuclear power plant is a core melt down.

Effect of Nuclear radiations:

1. Radiations may cause breaking of chemical bonds such as DNA in cells. This effect may be instantaneous, prolonged or delayed types. It may be even carried to future generations.

2. Exposure at low dose of radiations, people do not die, but begin to suffer from fatigue, vomiting and hair loss.

3. Exposure at high dose of radiation affect bone marrow, blood cells, natural resistance and blood to fail clot.

4. Exposure at very high dose of radiation kills the organisms by damaging the tissues of heart and brain.

4.7.2 NUCLEAR HOLOCAUST:

It means destruction of biodiversity by nuclear equipments and nuclear bombs. In a holocaust, a large number of living beings are totally destroyed. Usually, this kind of destructions are happened in a nuclear war.

Effect of Nuclear Holocaust

1. Nuclear winter

Nuclear bombardments will cause combustion of wood, plastics, petroleum, forest etc; Large quantity of black shoot will be carried to the stratosphere.

Black shoot will absorb UV radiations and will not allow the radiations to reach the earth. Therefore cooling will result Due to this cooling effect water evaporation will also reduce. In the stratosphere there would not be significant moisture to rain out the thick shoot. Thus due to nuclear explosion, a process known as opposite to global warming will takes place. This is called as nuclear winter.

Effects of Nuclear winter

a. Lowers the global temperature, even in summer temperature will be around freezing temperature.

b. Crop productivity will be reduced causing famines and human sufferings.

3. It ignites all combustible material, destroy all the living beings, material crushing, destruction of homes.

Eg of Nuclear Holocaust:

i. Nuclear war

Japan and Hiroshima are best egs of nuclear holocaust, which happened at II world war.

ii**. At Chernobyl:**

When the operators lost the control of a water cooled graphite moderated reactor during a low power tests at Chernobyl in Ukraine, the reactor exploded.

Control Measures:

1. Suitable precautions are to be taken and training must be given to people for handling these materials to avoid accident.
2. Constant monitoring of the radiation level has to be carried out, limit exposure to the workers.
3. Regular checks and control measures are done by Atomic Energy Regulatory Board under the Department of Atomic Energy.

4.8 CASE STUDIES

1. Uranium reprocessing in Japan

Nuclear accidents takes place at a Uranium reprocessing facility in Tokaimura, Ibaraki prefecture, Tokyo, Japan on September 30,1999. When the workers packed excess amount of uranium in uranyl nitrate solution, the tank was not to dissolve this type of solution . Due to high capacity of filling, high pressure was developed and the tank exploded.

4.9 WASTE LAND RECLAMATION:

Waste land

The land which is not in use is called waste land. The waste land is unproductive, unfit for cultivation, grassing, and other economic uses. About 20% of the geographical area of India is waste land

Types of waste land

Uncultivable waste land

Cultivable waste land

Uncultivable waste land

These land cannot be brought under cultivation e.g.) hilly slopes, desert etc

Cultivable waste land

These are cultivable but not cultivated for more than 5 years. Cultivable waste land are important for agricultural purpose e.g.) water logged, .saline land

Causes of waste land formation

Due to soil erosion, deforestation, water logging, salinity

The increasing demands for firewood and excessive use of pesticides

Overexploitation of natural resources

By the sewage and industrial wastes

Mining activities, destroys the forest and cultivable lands

Methods of Waste Land reclamation:

1. Land development and Leaching:

For reclamation of salt affected soil , it is necessary to remove the salts, which is usually achieved by leaching. It can be done by applying excess amount of water. The salt affected field is bunded in small plots and leaching is done. In continuous leaching, 0.5 to 1.0 cm water is required to remove 90% of soluble salts.

2. Drainage

This is requires for water logged soil reclamation where excess water is removed by artificial drainage.

3. Irrigation practices

Surface irrigation with precise land leveling, smoothening and efficient hydraulic design help to reduce water logging and salinity. Thin and frequent irrigation have been found to be more useful for better crop yield.

4. Gypsum amendment

Amendment of soldic soils with gypsum is recommended for reducing soil solidity as calcium of gypsum replaces sodium from the exchangeable sites.

5. Green- manures, fertilizers and bio fertilizers

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

6. Social forestry Programme

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

4.10 CONSUMERISM AND WASTE PRODUCTS

4.10.1 CONSUMERISM:

"Consumerism refers to the consumption of resources by the people".

It is an organized movement of people and government.

It is related to both increase in population size as well as increase in our demand due to change in life style.

Two types of conditions and population and consumerism exist.

1. People over-population

a. Excessive population pressure causes degradation of the limited source and there iks absolute poverty, under nourishment and premature deaths.

b. This occurs in less developed countries (LDCs).

c. Here due to large population, adequate resources are not available for all.

d. So there is less capita consumption although overall consumption is high.

2. Consumption over population

This occurs in 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 will is the waste generation and greater is the degradation of the environment.

In LDCs – number of people is very high, but per capita use of resources and waste generation are less.

In MDCs – number of people is low, but per capita use of resources and waste generation are very high.

Objectives of Consumerism

1. It improves the rights and powers of both sellers and buyers.
2. It maintains the good relationship between sellers and buyers.
3. Manufacturing products may reuse and recycle after usage.
4. Manufacturing products should be easily degradable and not cause any pollution.
5. Manufacturer should be liable for the entire life cycle of a product.
6. Active consumerism improves human health and happiness and also it saves resources.

4.10.2 WASTE PRODUCTS

Sources:

Agriculture, mining, industrial and municipal waste

Plastic have taken vital role when compared to other waste materials. Because plastics are neither biodegradable nor burned easily. The main problem in urban areas is the solid waste containing 20 to 30% plastics and polythene.

Effect of plastics and polythene wastes

1. It creates unaesthetic appearance in public places residential colonies and tourist spots.
2. Polythene bags are easily lifted by winds because of light weight and may reach open drains which causes bocking of sewer lines
3. They are non-biodegradable, if dumped in landfills; they stay for long time causing impaired biochemical reaction.
4. The consumption of polythene bags by stray goats, sheeps and cows causes chocking in the throat and stomach which leads to death.
5. A part from plastics and polythenes, there are different materials like paper, cardboard, metal can, tin products and others which used as packaging materials.

4.11 ENVIRONMENTAL LEGISLATION AND LAW

The "Environmental Protection Act" was established in the year 1980 for the production and improvement of environment and for the prevention, control and abatement of environmental pollution.

Objectives

1. Protection and improvement of environment(air, water and land)
2. Prevention of hazards to all living creatures (humans, plants and animals).
3. Maintenance of harmonious relationship between human beings and their environment.

Important protection Act

1. The Water (Prevention and control of Pollution) Act 1974.
2. The Air (Prevention and Control of pollution) Act, 1981.
3. Wild life protection Act,1972.
4. The Forest (conservation) Act, 1986.
5. The Environment (protection) Act, 1986.
6. The Motor Vehicles Act, 1988.

4.11.1 AIR (PREVENTION AND CONTROL OF POLLUTION) ACT

It established in the year 1981.

The objectives of the acts are:

i. Prevention and control of air pollution.

ii. Maintaining the quality of air.

iii. Establishment of Board for the prevention and control of air pollution.

Following are powers and functions of boards.

1. Power to declare air pollution control area.

2. Power to establish standards for emission of air pollutants from automobiles.

3. Power to restrict use of industrial plants.

4. Power of entry and inspection.

5. Power to take samples.

6. Penalties for violations of the provisions of the act.

4.11.2 WATER (PREVENTION AND CONTROL OF POLLUTION)ACT

It was established in the year 1974.

The main objectives are :

i. Prevention and control of water pollution.

ii. Maintaining and restoring wholesomeness of water.

iii. Establishment of boards of the prevention and control of water pollution.

Powers of the State Government are :

a. Power to obtain information.

b. Power to take samples.

c. Power of prohibition on disposal of polluting matter into a stream or well.

d. Consent of State Board.

e. Penalties for violation of the provision of the act.

Functions of Central Board under section 165-4

1. To promote cleanliness of streams and wells in different areas of the State.

2. To advise the Central Government on matters concerning the prevention and control of water pollution.

3. To produce Technical assistants and guidance to the State Board to carry out research in prevention and control of water pollution.

4. To organize training of people engaged in pollution control.

5. To lay down standards for stream or wells.

6. To prepare manuals, codes or guides for treatment and disposal of sewage and industrial effluents.

7. To establish or organize laboratories for analysis of water sample from any streams, wells or trade effluent.

The state pollution control board also have similar functions to be executed at state level and are governed by the directions of CPCB.

4.11.3 WILD LFE PROTECTION ACT

• The wild life act was enacted on 9th September in the year 1972 to protect animals and birds.

• It established the regulation of possession, acquisition, and trade in wild animals and animal products.

• Te act also provides for constituition of a wild life advisory board to advise the State Government in selection of areas to be declared as sanctuaries and National parks, in formulation of the policies for protection and conservation of wild life and in any other matter related to the wildlife.

• It imposes restrictions on hunting of wild animals. Packing, uprooting, acquiring and collecting specified plants are prohibited from any forest land.

Objectives of wildlife act

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

Important features:

1.The act covers the rights and non-rights of forest dwellers

2. It provides restricted grazing in sancutaries but prohibits in national parks.

3. It also prohibits the collection of non-timber forest.

4.11.4 FOREST CONSERVATION ACT

• With a view to check further deforestation, on 27th December 1980, Forest (conservation) Act was enacted.

• It provides for the conservation of forest and imposes restrictions on the deservations of reserved forest and use of forest land for non forest purpose.

• Compensatory a forestation is required in case of where diversion of forest land is permitted.

Objectives of forest act

(i)To product and conserve the forest.

(ii)to ensure judicious use of forest products.

Important features of forest act

(i)the reserved forest shall not be diverted with out the prior permission of the central government.

(ii)the land that has been notified may be not be used for non forest purpose

(iii)Any illegal non-forest activity within a forest area can be immediately stopped under act.

4.11.5 ENVIRONMENT (PROTECTION) ACT

This act is enacted for the safe disposal of waste by the industries and obligates industries to submit "Environment Report" for every year. By this act the government has power to close down any firm which violates environmental quality.

The main aim of this act is :

• To provide protection and improvement of environment.

• To provide for the regulation of discharge of environmental pollutants and handling of hazardous substance.

• To provide for the creation of an authority or authorities, which is provided with powers to protect environment.

• To provide for speedy response in the event of accidents threatening environment and deterrent punishment to those who endanger human environment, safety and health.

4.12 BIO-MEDICAL WASTES:

Bio medical wastes are one of the biowastes generated from health care activites . Bio medical wastes may be soild or liquid in nature and also be hazardous as well as non hazardous.

Bio medical waste must be properly managed and disposed off safety to protect the environment. If it is not properly treated produces many infectious diseases.

Bio medical waste rule 1998 and amendments

In order to regulate the disposal or bio medical wastes,MEF(Ministry of environment and forest), Govt of India, notified Bio medical wastes (management and handling) rules 1998 and amended twice in the year of 2000. These rules apply to all hospitals, nursing home, laboratories, etc.

Steps involved in management of Bio medical wastes

Three steps

1.Generation and accumulation

2.Handling and storage

3.Transport and disposal

1.Generation and accumulation(segregation)

Bio medical wastes generated by health care centres should be collected in the containers which are leak proof and strong to prevent breakage during handling. It should not be mixed with other waste.

2.Handling and storage:

Handling refers to the act of manually moving biomedical waste between the point of generation accumulation area.

3.Treatment and disposal: The aim of biomedical waste treatment is to reduce the waste and make the waste unrecognizable.Treatment may occurring two places

Onsite treatment

Offsite treatement

Onsite treatment : It involves use of relatively Expensive equipment and it use only by very large hospitals and major universities.

Offsite treatment:It involves hiring of a biomedical waste disposal service.

Types of Treatment:

Incinerator:It will destroy pathogens and sharps.

Autoclaves:It uses steam and pressure to sterilize the waste.

Disposal:Waste liquida may be disposed off to a sanitary sewer that laeds to a sewage treatment plant.

4.13 SCHEMEOF LABLING OF ENVIRONMENTALLY FRIENDLY PRODUCT(ECO-MARKS)

Environmently friendly products are generally indicated by the symble (logo) called Eco-mark. Eco-mark is a certification mark issued by the Bureau of Indian standard (BIS) to the environmental friendly products.

Logo for eco-mark in india

The Ministry of environment and forest (MEF) ,Government of India has given an earthen pot as the logo for the eco-mark in india.

Objective of eco-mark

1.To encourage every citizen to purchase products having a less harmful to environment impact.

2. To improve the quality of the environment and to encourage sustainable management of the resources.

3. To provide an incentive to importers and manufacturers to reduce the adverse environmental impact of their products.

4.To reward genuine initiatives by companies for reducing the adverse environmental impact of their products.

Criteria (or) requirements for awarding Eco-mark

1. Sources of raw materials

2. Production process

3 . Use of natural resources

4. Energy conservation in the production of product

5. Disposal waste

6. Utilisatin of wastes and recycled materials

7. Product to be accompanied by detailed instructions for proper use.

8. Bio-degradability

Procedure for obtaining Eco-mark

1.The procedure for grant of licence is the same as applicable for grant of licence by BIS for its product certification mark scheme

2. Licence will be granted initially for one year and is renewable

4.14ISSUESINVOLVED IN ENFORCEMENT OF ENVIRONMENTAL LEGISLATION

Following are the issues:

• Even in developed countries, subsidized and mandated pollution control equipment has often been ineffective.

• Subsidized charges for energy water, pesticides and fertilizer contribute to pollution problems.

• Abatement will be cheap if polluters face an emission tax, because only polluters with low abatement cost will choose to reduce emissions, while those with higher costs will prefer to pay the charge.

• In addition, there are some "indirect instruments"- those that are not directly related to emissions but create pollution unintentionally. Public finance policies, through their impact on relative prices, will often have a impact on pollution.

• In the real world, monitoring each pollution is often costly or impossible, and thus it might be more effective to use selective taxes or regulations to stimulate pollution control indirectly.

• Most regulatory agencies lack the personnel and other resources to inspect and monitor all emission controls within their jurisdictions.

4.15 ROLE OF NON-GOVERNMENTAL ORGANIZATION

What are non-governmental organisations (NGOs)?

A civic or public advocacy organisation, which generates, transfers, or administers humanitarian and other aid (development / relief)

Generally, NGO's are organised as nonprofit corporations (charities)

Can be local or international (INGOs)

May work with or independent of government

Generally, do not include professional associations, businesses, and foundations

Examples of NGOs involved in disaster & humanitarian crisis response

Care

MSF

Oxfam

Red Cross (not ICRC)

Save the Children

St John Ambulance

World Vision

Who are the other players in disaster health management?

Government

National

State/Provincial

Local

United Nations

Donors

Hybrid organisations with own defined status

International Committee of the Red Cross (ICRC)

How do they operate?

NGOs vary greatly

Organizational structure is similar to businesses

Usually non-rigid hierarchy; significant flexibility and authority at the field level

International NGOs often team up with local NGOs or have regional or local branches

Core values

Neutrality

Aid will not be used to further a particular political or religious standpoint

Impartiality

Aid is given regardless of race, creed, or nationality

Aid is based on need alone

Independence

Aid agencies shall not act as instruments of government foreign policy

What do they do?

Operational verses Advocacy

Grassroots, long-term projects, development work

Willing to work in high risk areas; not constrained by sovereignty

In theory, emphasis on sustainability

Full integration with local population

Good positioning for disaster response

4.16 PRINCIPLES OF GREEN CHEMISTRY

1. **Prevention**

It is better to prevent waste than to treat or clean up waste after it has been created.

2. **AtomEconomy**

Synthetic methods should be designed to maximize the incorporation of all materials used in the process into the final product.

3. **LessHazardousChemicalSyntheses**

Wherever practicable, synthetic methods should be designed to use and generate substances that possess little or no toxicity to human health and the environment.

4. **DesigningSaferChemicals**

Chemical products should be designed to affect their desired function while minimizing their toxicity.

5. **SaferSolventsandAuxiliaries**

The use of auxiliary substances (e.g., solvents, separation agents, etc.) should be made unnecessary wherever possible and innocuous when used.

6. **DesignforEnergyEfficiency**

Energy requirements of chemical processes should be recognized for their environmental and economic impacts and should be minimized. If possible, synthetic methods should be conducted at ambient temperature and pressure.

7. **UseofRenewableFeedstocks**

A raw material or feedstock should be renewable rather than depleting whenever technically and economically practicable.

8. **ReduceDerivatives**

Unnecessary derivatization (use of blocking groups, protection/ deprotection, temporary modification of physical/chemical processes) should be minimized or avoided if possible, because such steps require additional reagents and can generate waste.

9. **Catalysis**

Catalytic reagents (as selective as possible) are superior to stoichiometric reagents.

10. **DesignforDegradation**

Chemical products should be designed so that at the end of their function they break down into innocuous degradation products and do not persist in the environment.

11. **Real-timeanalysisforPollutionPrevention**

Analytical methodologies need to be further developed to allow for real-time, in-process monitoring and control prior to the formation of hazardous substances.

12. **InherentlySaferChemistryforAccidentPrevention**

Substances and the form of a substance used in a chemical process should be chosen to minimize the potential for chemical accidents, including releases, explosions, and fires.

4.17 PUBLIC AWARENESS:

Our environment is presently degrading due to many activities like pollution, deforestation, overgrazing, rapid industrialization and urbanization

In order to conserve our environment, each and every one must be aware about our environment problems

Objectives of public awareness

To create awareness among people of rural and city about ecological imbalances, local environment, technological development and various development plants

To focus on the current environment problems and situations

To train our planners, decision makers, politicians and administrators

To learn to live simple and ecofriendly manner

To eliminate poverty by providing employment that overcomes the basic environmental issues

Methods to create environmental awareness

Environmental awareness should be created through formal and informal education to all sections of the society

Schools and colleges

Environmental education must be imparted to the students in schools and colleges

Through mass media

Media like radio, TV and cable network can educate the people on environmental issues through cartoons, documentaries, and streetplays

Cinema

Film about environmental education should prepared and screened in the theatre compulsory. This films may be released with tax free to attract the public.

News paper

All the newspaper as well as magazines must publish the environment related problems

Audio-visual media

To disseminate the concept of environment, special audio-visual and slide shows should be arranged in all public places

Voluntary organizations:

The services of the voluntary bodies like, rotary club, NCC, NSS should be spreading the environmental awareness.

Leaders appeal

Political leaders, cine actors and popular social reformers can make an appeal to the public about the urgency of environmental protection.

Traditional techniques:

The traditional techniques like folk plays , drams may be utilized to spread environmental messages to the public.

Arranging competitions

Story writing ,essay writing, and the painting competitions on environmental issues should be organized for students as well as for the public.

Non –government Organizations:

Voluntary organization can help by advising the government about some local environment issues. Also they can be effective in organizing public movements for protection of environment through creation of awareness.

4.18 CENTRAL AND STATE POLLUTION CONTROL BOARD

Central enactments:

Air pollution the India boiler's act, 1923

The factories act, 1948

The mines and minerals act, 1947

The industries act, 1951

The air act, 1981

Water pollution

The river boards act, 1956

The merchant shipping act, 1970

The water act, 1974

The water less act, 1977

Pesticides

The factories act, 1948

The insecticides act, 1968

The poison act, 1991

Radiation

The atomic energy act, 1962

Radiation protection rules act, 1972

Forest, fisheries and others

The Indian fisheries act, 1897

The Indian forest act, 1927

The prevention of food adulteration act, 1954

Comprehensive environment protection

The environment act, 1986

State enactments:

Smoke control

The Bengal smoke nuisance act, 1905

The Bombay smoke nuisance act, 1912

Water pollution

Orissa river pollution prevention act, 1905

Maharashtra prevention if water pollution act,1969

Land use

The Bihar waste land act, 1946

The Andhra Pradesh improvement scheme act, 1949

The Delhi restriction of uses of land act, 1964

Pest control

The Mysore destructive insects and pests act, 1917

The U.P agricultural diseases and pests act 1954

The Kerala agricultural pests and disease act, 1958

4.19 DISASTER MANAGEMENT

Disaster is a sudden calamity which brings misfortune and miseries to humanity.

Types:

1. Natural disaster
2. Manmade disaster.

1. Natural disaster: Floods, Cyclones, earth quakes, landslides etc

2. Manmade disaster: Accidents, pollutions, fire accidents, bomb blasts.

FLOODS

Definition: whenever the magnitude of water flow exceeds the carrying capacity of the channel within its banks, the excess of water overflows on the surroundings causes floods

Causes:

1. Heavy intense rain fall

2. Melting of accumulated snow.

3. Melting of snow combine with rains.

4. over saturated soil when the ground cannot hold any more water.

5. Urbanization

Control:

1. Forecast, warning and advice should be provided through media to educate aware people about steps to be taken on the event of mishap.

2. Valuable house hold items, animals and materials like food, clothes, medicines etc. should be shifted to safe places.

3. Elderly people and children should be evacuated to safer place on emergency.

4. by the construction of protective works.

Case study: Bangladesh – 1974

Every year large areas are submerged during monsoon season. In 1974 when flooding extended over nearly one half of the country and stagnated for more than a month. Nearly 1200dead in the floods and 2, 75,000 died from subsequent diseases and starvation. About 4, 25,000 houses were damaged. A total of 36 million people suffered hardship and losses due disaster.

CYCLONE

Cyclone is a metrological phenomenon, intense depressions forming over the open oceans and moving towards the land. On reaching the shores, it move into the interior of the land or along the shore lines

An atmospheric closed circulation, rotating anti- clock wise in the northern hemi sphere and clock wise in southern hemisphere . Cyclone is an area of low pressure in the centre and high pressure outside. Powerful swirling storm that measures from 300- 500 km in diameter. The wind in the centre of cyclone blows in the speed of 120km/hr. In India cyclone originates from Bay of Bengal are more in number and intensity, relatively less in south-west Indian Ocean and Arabian Sea. In India cyclones occur during October-December or April-May.

Different names of cyclones:

Name of cyclone	**places**
Hurricanes	In Atlantic ,Caribbean
Typhoons	In japan,china
Willy willies	In Australia

Effects:

Damage to human life, crops, roads, transport, and communication could be heavy.

Cyclone slows down developmental activities of the area.

Management:

Meteorological Departments forecast by satellite images the weather conditions which reveal the strength and intensity of the storm.

Radar systems are used to detect cyclone and cyclone warning.

The effect of cyclone is minimized by planting more trees on the coastal belts, constructional dams, wind breaks etc.

Case study:

Cyclone in Orissa 1999- Two cyclone in Orissa occurred in 18 and 29 of October 1999.In the central area in Orissa a powerful cyclone storm hit with the wind velocity of 260km/hr.Nearly 14 of 30 districts of Orissa went in severe damage. 15 million people were affected and 90-95% of crop yield was also affected.11, 500 local schools have been damaged.

EARTHQUAKE

Sudden vibration caused on the earth surface due to sudden release of tremendous amount of energy stored in the rocks under the earth crust is called earthquake. A focus of an earthquake is the point of initial movement. Epicenter is the point on the surface directly above the focus.

Measure of Earth quake- Richter scale:

Magnitude of earthquake is a measure of amount of energy released in the earthquake. Earthquake is recorded by seismograph.

Less than 4	Insignificant.
4-4.9	Minor
5-5.9	Damaging
6-6.9	Destructive

7-7.9 Above 8	major great

Primary effect of earth quake: Shaking, Sometimes a permanent vertical or horizontal displacement of the ground .This affects people bridges, dams, and pipe lines.

Secondary effects: Rocks slides, flood caused by the subsidence of land, coastal areas are severely damaged .Earth quake generated water wave called Tsunami and also called tidal waves that travel as fast as 950km/hr.

Precautionary measures:

1. People should come out of their homes and stay in the open till the tremors subside.

2. People already out of home should stay away from the building electric poles, trees and any tall objects that have chances of falling down.

3. After the earth quake relief camp by the Government or other social groups should be conducted for the affected people.

LAND SLIDES:

The movement of earth materials like coherent rock, mud, soil and debris from higher region to lower region due to gravitational pull is called landslides. A landslide is a sudden collapse of large mass of hill side.

Types:

Shallow disrupted land slide

Decoherent landslide.

Factors causing landslides:

Gravity-gravity works more effectively on steeper slopes

Weather: Most slides occur during or after heavy rains.

Earth quake, shocks, vibrations and cyclone create landslides

Underground caves and underground mining activities may also leads to subsidence

Effects:

Flow deposit blocks the road and diverts the passage.

Causes of erosion of the soil increases

Sudden landslides damages the houses, crop yield, live stock etc.

Prevention:

Collect runoff from roofs and improved areas and convey water from the steep slopes in a well designed pipe system.

Steepness of the slope can be reduced by developing benches

Case Study: Landslide In UP 20 August 1998. Malpa Village Pithoragrah district of UP on 18 August 1998 had a land slide. At least 180 people including 60 kailash Manasorovar pilgrims and 8 Indo-Tibet border Police personnel were killed. The state government has announced a grant of 237,905 dollars for relief and rescue operation.

TSUNAMI

It is a Japanese word which means harbour wave.|| Tsu|| means harbour and ||nami|| stands for wave. Tsunami is large waves of water generated when the sea flow is deformed by seismic activity, vertically displacing the overlying water in the ocean.

Phenomenon:

Tsunami is not a singular wave but a series of waves like a ordinary waves one can see on a beach. Ordinary waves have the wavelength of 100 mts. Tsunami have a wavelength of 500 kms and there could be as much as a hairs gap between eaves. The speed of Tsunami waves across deep sea is 1000 km/hr.The energy lost by tsunami waves is inversely proportional to the wavelength. Tsunami was extremely fast moving and high volume of water. The waves are several hundreds of kms of waves and traveling 1000 km/hr.

Effects:

Tsunami attacks mostly the coastal lines damaging property and life.

Kills lot of human being and livestock also spread lot of waterborne disease.

Management:

Earthquake under the sea are monitored by sensors on the floor of sea. The sensors send information of floating buoys on the surface whenever they detect the change in the pressure of the sea.

The information is relied to satellite which passes it to the earth station. All member nations warning system are warned of the approaching danger.

Finally the country make the people alert to make all necessary precautions.

Case study:

Tsunami in India: Tsunami was formed on 26 December 2004 in Bay of Bengal and in the Indian Ocean. The tidal waves occurred due to massive earthquake under the ocean floor of Indonesian coast. The magnitude of earthquake is 8.9 on Richter scale and stroked northern Sumatra and Indonesia at 6.25a.m.Tsunami travels at a speed of jet engine (700-800 km/hr) and hit Tamilnadu and Srilanka coast about 2-3 hrs after the earthquake.Nagapatinam was worst hitted by Tsunami in India. About 6000 people were dead and huge property loss.

TWO MARKS

1. State the declaration about the sustainable development.

The Rio declaration states that, "human beings are at the center or concern for sustainable development. They are entitled to a health and productive life in harmony with the nature. Rvery generation should leave air. Water and soil resources without any pollution as pure as it came to the Earth."

2. Define sustainable development.

Sustainable development is defined as meeting the needs of the preset without compromising the ability of future generations to meet their own needs.

3. What are the three important components of sustainable development?

The three important components of sustainable development are