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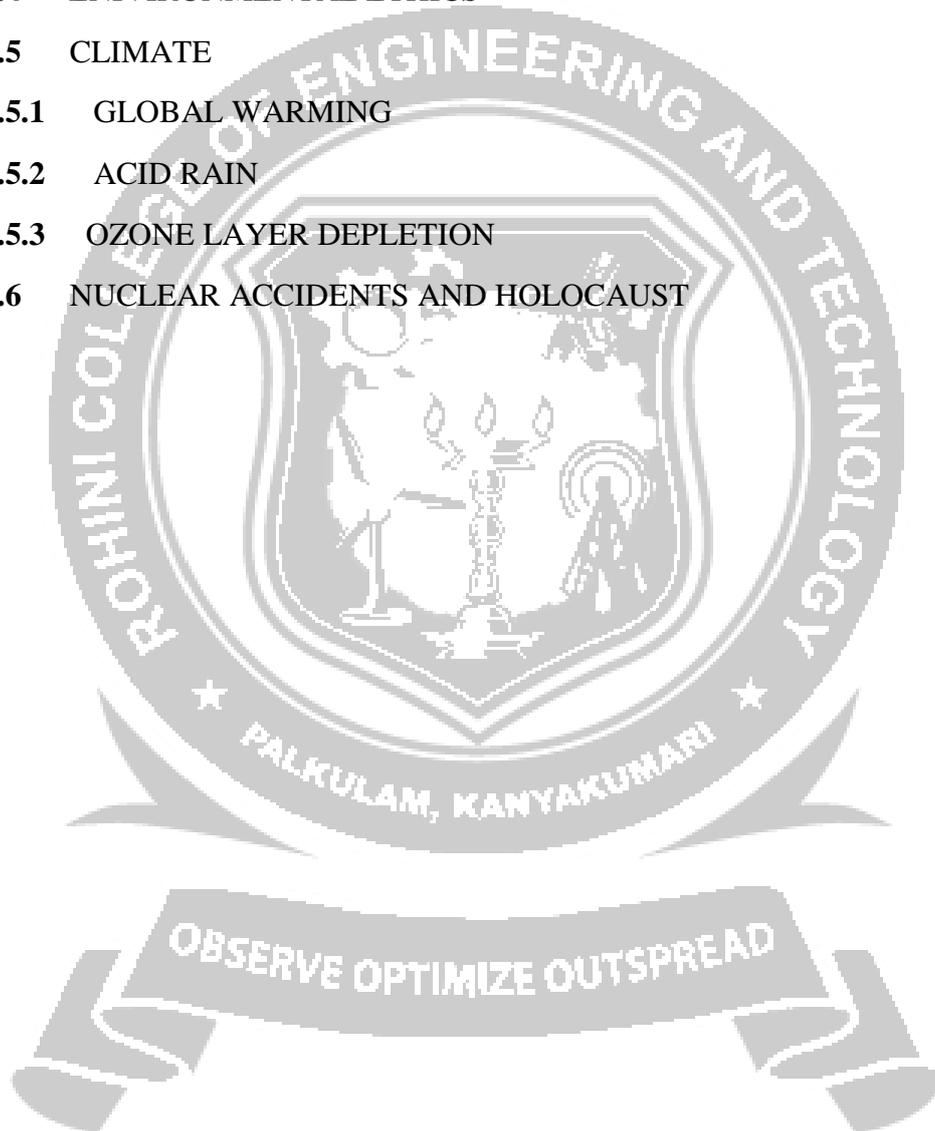
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4.2 WATER CONSERVATION

“The process of saving water for future (generation) utilization is known as water conservation.”

Rain H₂O is the main source of fresh H₂O and it is in pure form. The other sources are like ponds, rivers, lakes, oceans etc. Due to the tremendous increases of population, industries, agricultural activities, the quality & quantity of H₂O have decreased. So H₂O is the most important component to human survival and other industrial, commercial & agricultural activities.

4.2.1 NEED OF WATER CONSERVATION

1. Though the water resources are more, its quality is not high due to changes in the environment factors.
2. Better life styles require more fresh H₂O.
3. Due to deforestation, the annual rainfall is decreasing.
4. Over exploitation of ground H₂O, leads to drought.
5. Agricultural & industrial activities require more fresh H₂O.
6. The need of H₂O is increase due to population increase.

4.2.2 STRATEGIES (MEASURES) OF WATER CONSERVATION

1. Construction of check dams in rivers.
2. Recycling of waste H₂O.
3. Limited use of H₂O in agriculture by adopting drip irrigation.
4. Reducing evaporation of H₂O
5. Reuse of H₂O.
6. Use limited H₂O for domestic purposes
7. Surface runoff is prevented.
8. Avoiding discharging of waste into water resources.
9. Increasing percolation of rain H₂O.

10. Follow the rain H₂O harvesting methods.

4.3 RESETTLEMENT AND REHABILITATION OF PEOPLE

“Resettlement is the shifting of people from their native place to a new area by providing a land”.

Causes of resettlement

1. Construction of dams, Airports, wild life sanctuaries, national park, highways.
2. Due to the disasters like flood, drought, Tsunami, cyclones wars.
3. Nuclear accidents, earth quakes.

Rehabilitation

The facilities provided to the resettled people to satisfy their needs in the new area are called rehabilitation.

Rehabilitation includes the following activities

1. The people should be rehabilitated to the very nearby area ‘minimum dislocation policy’ should be followed.
2. Construction of houses, in colonies.
3. Free medical service.
4. Protection from native people and wild animals by arranging security guards.
5. Psychological service by NGOs.
6. Land substitution.
7. Food resources are made available to them at a low cost.

8. Employment generation programmes are conducted in the resettled area.

Problems of resettlement

1. Loss of home, job, land, food security and social isolation increases the poverty of tribal people.
2. Break up of families is an important social issue in which the women are severely affected and they are even not given cash compensation.
3. Even if the tribal get cash compensation, they are not familiar with the market policies and trend.
4. Marriages, social & cultural functions, their folk – songs dances and activities vanish with their displacement.
5. Loss of identity and loss of intimate link between the people and the environment is one of the big loss.

4.4 ENVIRONMENTAL ETHICS

“Environmental Ethics refers to the issues, principles and guidelines relating to human interactions with their environment”.

It is a moral relationship of human beings with the environment. It is concerned with do's and don'ts of the human beings to the environment. For (ex) A mango tree gives a mango fruit to propagate its kind. Man plucks the fruit and eat it. Ok do it. But do justice to the tree. After eating the flesh of the fruit, don't throw away the seed. Sow it in a safe place and nurse it to grow into a tree. This is environmental ethics.

Environmental ethics is maintained by the following methods.

1. Equitable utilization of natural resources.

2. Equity among people of rural & urban areas.
3. Equity for males & females.
4. Conservation of resources for future generation.
5. Environmental rights of animals.
6. Environmental education.
7. Conservation of traditional value systems.
8. Prevention of sacrifice of animals to pujas.
9. Prevention of hunting & poaching
10. Prevention of Eco terrorism.
11. Use of ecofriendly items
12. Avoid carry bags and plastic items.
13. Keeping the environment neat & clean.

4.5 Climate★

Climate is the weather conditions of the environment. It includes temp, wind, rainfall, humidity, light etc. the average of such conditions over a long period is called climate.

Causes of climatic change

1. Seasonal changes.
2. Failure of rainfall.
3. Drought
4. Increase of green house gases
5. Depletion of ozone layer

6. Rotation of earth on its axis.

Effects of climatic change

1. Drought
2. Flood
3. Cyclone
4. Melting of polar ice caps
5. Intrusion of sea waves
6. Disturbance of agriculture, leads to migration of peoples & animals.
7. Affects the hydrological cycle.

Green house effect

Green house effect is the increased warming of the earth caused by the rise in CO_2 content of the air.

In green house effect, the temp of the earth increases causing global warming.

4.5.1 GLOBAL WARMING

The overheating of the earth by the increased amount of green house gases is called global warming.

Causes

1. Automobiles
2. Industries
3. Agriculture
4. Burning of fossil fuels
5. Cleaning solvents

6. Refrigerators
7. Air Conditioner.

Effects

Green house effect increases global (warming) temperature. The increase in global temp produces the following ill effects.

1. Effect on sea level:

The Polar ice caps will melt causing an increase in sea level. When the sea level increases, low lying coastal areas will be submerged.

Melting of ice leads to floods in the river.

2. Effect on water resources:

Rising of temp will increase the demand of domestic water, it leads to drought. Due to seasonal change, global rainfall pattern will change, it leads to flood.

3. Effect on agriculture & forestry:

High CO₂ level in the atmosphere produces the ill effects on the crop production and forest growth.

As climatic pattern shifts, rainfall is reduced and soils are dried out , resulting in major drought.

4. Effect on human health:

High temp may harmful to the life of man. Due to the formation of flood & drought, many water-borne diseases and infections diseases are arrived.

5. Effect on Ozone layer depletion

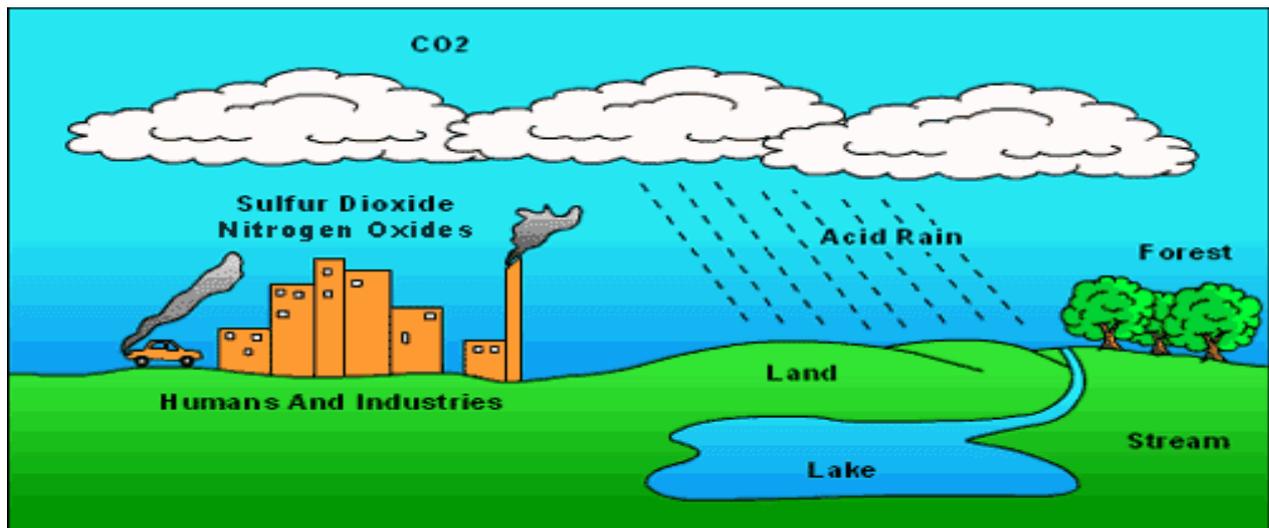
Due to the CO₂ gas, the ozone umbrella will be depleted.

Control measures

Global warming can be controlled by the following methods.

1. The fossil fuels such as petrol, coal, diesel can be replaced by electric current & sunlight.
2. Reduce the burning of wood for fuel purpose.
3. Forest fire should be prevented.
4. Plant more number of trees
5. Utilize the renewable energy resources
6. Use hydrofluro carbon in AC, fridge instead of CFC
7. Conducting awareness programmes regarding the green house effects & global warming.
8. Reduce the population growth,
9. Conferences, meetings must be arranged at the national, international & global level to discuss the ways and means to control green house effect.

4.5.2 ACID RAIN



Acid Rain

The presence of excess of acid in the rain water is called acid rain. It is due to the air pollution. It is otherwise known as acid deposition. The normal rainfall has pH of 5.6 when the pH of rain water is less than 5.6 it is called acid rain.

Causes of acid rain

- 1) It is caused by air pollutants like SO_2 & NO_2
- 2) SO_2 & NO_2 dissolves in rain H_2O to form H_2SO_4 & HNO_3 respectively.
- 3) The pollutants are produced by burning of coal, petrol, diesel, fire wood.
- 4) They are released from thermal power stations, factories & automobiles.
- 5) The acid rain pollutants are released into air, and are carried away by wind.

Consequence of acid rain

I. Effect of acid rain on human beings

- 1) Acid rain contaminates potable H_2O and causes abnormality in the nervous system, respiratory system and digestive system.

It causes asthma & bronchitis in human beings.

II. Effect of acid rain on buildings

1. Acid rain damages the buildings
2. Acid rain corrodes houses, monuments, statues, bridges & fences.
3. Acid rain corrodes metals & deterioration of paints & stone.
4. Acid rain causes stone leprosy in TajMahal.
5. It causes corrosion of British Parliament building.

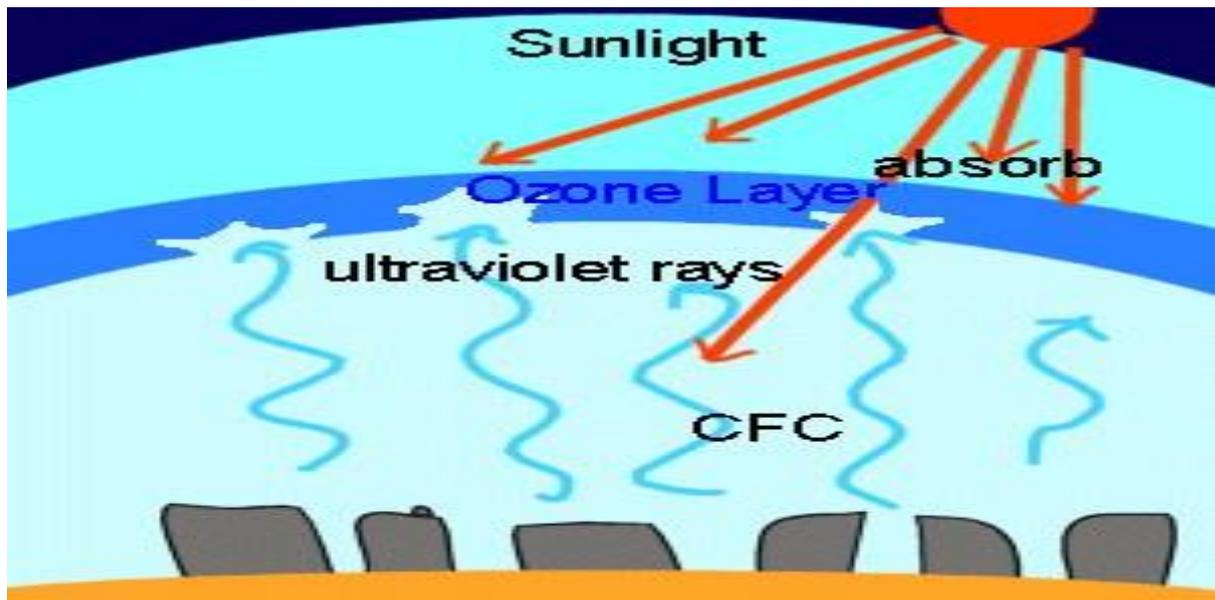
III. Effects of acid rain on terrestrial & lake ecosystem

1. The acid rain leached the soil nutrients such as, calcium, potassium, iron, magnesium. They are washed away from forest soil. Hence the forest growth is affected.
2. Photosynthesis is reduced.
3. The yield of the crop plants are reduced.
4. The bacteria & green algae are killed by acidified H_2O
5. Acid rain damages the green leaves and hence the forest
6. The activity of nitrogen fixing bacteria present in the root nodules is inhibited, so the fertility of soil is reduced.
7. It also prevents respiration & causes death of fishes.

Control methods

1. Replacing fossil fuels with alternate energy
2. Limited use of fossil fuels
3. Limited use of fossil fuel vehicles
4. Control of emission of SO_2 and nitrous oxide & NO_2 from factories & automobiles.
5. Liming of soil and lakes

4.5.3 OZONE LAYER DEPLETION



Ozone is highly concentrated in the stratosphere h/w 10 & 50 Km above sea level, is known as the 'ozone layer'. The thinning of ozone layer is called ozone depletion. It leads to the formation of ozone hole.

Causes of ozone layer depletion

Ozone depletion is caused by natural as well as man-made process.

1. Sunlight stimulates the atmospheric N_2 to change into nitrogen oxide. The nitrogen oxide depletes ozone by photochemical reaction.
2. The nitrous oxide released by supersonic aircrafts depleted ozone.
3. Chlorofluoro-carbons used as coolants in refrigerators, air conditioners and solvent cleaners in micro electronic industries.
4. Halons are used as fire extinguishers, causes ozone layer depletion.
5. Burning of coal & oil and nitrogenous fertilizers also destroy ozone.

Consequence of Ozone layer depletion

I. Effect on human health

1. Production of skin cancer in human beings
2. Aging of the skin
3. The immune system is weakened
4. Breast cancer, blood cancer
5. Cataract.
6. Swelling, Bleeding in the lungs.
7. Broachities, Asthma
8. DNA breakage, cell death.

II. Effect on Aquatic systems

1. Death of phyto plankton, leads to starvation of Zoo plankton, fishes and marine animals.
2. Decrease in fruits & vegetable yield.
3. Reduction in photosynthesis.

III. Effects on Materials

1. Degradation of paints, plastics & polymeric materials leads to economic loss.

IV. Effect on climate

1. It produces green house effect.
2. Global warming is increased.

Control Methods

1. Replacing CFC by other materials which are less damaging
2. Uses of gases like methyl bromide is controlled.

3. Manufacturing and using of ozone depleting chemicals should be stopped.

4.6 NUCLEAR ACCIDENTS AND HOLOCAUST

The sudden & unexpected release of nuclear energy and nuclear compounds into the environment is called nuclear accident.

Nuclear accident causes mass death called nuclear holocaust.

Causes of nuclear Accident

1. Natural disasters like earthquake, tsunami
2. Human error
3. Operational error
4. Nuclear melt down – power plant failure & accidents
5. Accident during transport
6. Equipment error
7. Unsafe disposal of radio active waste
8. Nuclear test.

Consequence of nuclear Accidents

1. Radiations may break chemical bonds such as DNA in cells
2. Exposure at low dose radiation, produces fatigue, vomiting, loss of hair.
3. High dose radiation, leads to bone marrow, blood cells, failure to blood clot.
4. Very high dose radiation kills organisms by damaging heart tissues & brain.

Nuclear – Holocaust

The large scale destruction of human lives by nuclear accident is known as Holocaust. This kind of destructions are happened in a nuclear war.

Consequence of nuclear Holocaust

1. Nuclear winter

- ❖ Nuclear bombardment will cause combustion of wood, petroleum, forest, etc. produces large quantity of black soot in the stratosphere.
 - ❖ The black soot absorb all UV radiations and does not allow to reach the earth.
 - ❖ Due to this cooling effect, water evaporation will also reduce
 - ❖ The process is known as nuclear winter, it is opposite to global warming.
 - ❖ Due to nuclear winter, the crop productivity will be reduced, causing famines & human suffering.
- 2) It ignites all combustible material, destroys all the living beings, material crushing, destruction of homes.

Control Methods:

1. Suitable precautions should be taken to avoid accident.
2. Constant monitoring of radiation level.
3. Regular check & control measures are done by Atomic Energy Regulatory board under the Department of atomic energy.