

Notes - 5th chapter

- * Environment - environment is everything that is around us. It can be living or non-living things. It includes physical, chemical and other natural forces.
- * pollution and pollutant - pollution is the effect of undesirable changes in the environment. which can harm plants and animals and human is called pollution and the element which causes the pollution are called pollutant.

Various types of pollution -

- a) air pollution
- b) Water pollution
- c) soil pollution
- d) noise pollution etc.

1 → Air pollution - Air pollution happens when harmful substances like smoke, chemicals and dust enter the air. These pollutants come from things like cars, factories, and burning waste. It can harm people's health, animals and the environment.

Sources of air pollution -

- 1 Cars and Trucks - They release harmful gases like carbon dioxide and nitrogen.
- 2 Factories - They release smoke and chemicals into the air.

3. Burning waste - Trash burning releases harmful smoke.
4. Power plants - They burn fossil fuels and release pollutants.
5. Wildfires - Burning trees and plants create smoke as pollution.
6. Agriculture - fertilizers release gases into the air.

Effect of air pollution - Air pollution can cause health problems like breathing issues, asthma and lung disease. It can also harm animals, damage plants, and make the air unsafe to breathe.

Control of air pollution - To control air pollution, we can:

- (i) Plant trees - Trees help absorb harmful gases from the air.
- (ii) Recycle and reduce waste - Less waste means less burning and pollution.
- (iii) Use eco-friendly products

iv) Promote electric vehicles:

- (v) Reduce burning of waste
- (vi) Factories should use cleaner technologies.

2- water pollution - Water pollution happens when harmful substances like chemicals, trash, and waste get into oceans, lakes, and oceans. This makes the water dirty and unsafe for drinking, swimming, and for animals that live in it.

Sources of water pollution-

- 1 Industrial waste - Factories release harmful chemicals into rivers and lakes
- 2 Oil from ships and pipelines can pollute oceans and rivers.
- 3 Plastic waste - Trash, especially plastic, is dumped in water bodies, harming marine life.

Effects of water pollution -

- (i) Health issues
- (ii) Loss of marine life
- (iii) Damage of ecosystems
- (iv) Polluted water is unsafe for drinking
- (v) It affects industries such as fishing, agriculture, and tourism.

Control of water pollution -

- iv) Proper waste disposal - dispose of chemicals and trash properly instead of dumping them in water.
- v) Clean waterways - regularly clean rivers, lakes and oceans to remove waste.
- vi) Wastewater Treatment - Treat sewage and industrial waste before releasing it into water bodies.
- vii) At the international level, there should be a ban on nuclear tests in the ocean.

3 Soil pollution - soil pollution happens when harmful substances, like chemicals, plastic or waste, get into the soil. Its high enough concentration to pose a risk to human health and the ecosystem.

Causes of soil pollution

- i) Industrial waste - Factories dump harmful chemicals.
- ii) Pesticides and Fertilizers - Overuse in farming can poison the soil.
- iii) Plastic waste - Plastic garbage doesn't decompose and stays in the soil.
- iv) Improper waste Disposal - Throwing trash on the ground causes pollution.

Effect of soil pollution -

- a) Bad for plants - polluted soil makes it hard for plant to grow
- b) Harmful to Animals - Animals that eat plants or live in polluted soil get sick.
- c) Water pollution - chemicals in the soil can mix with water, making it unsafe to drink
- d) Health issues - Pollutants in soil can affect human health, causing diseases.

control of soil pollution

- a) Planting trees and sowing grasses
- b) Promote bio Fertilizers
- c) Reduce Toxic Waste
- d) Proper waste Disposal
- e) Recycl and reuse.

4 Noise Pollution - The noise is defined as the unwanted sound which is released into the environment. It disturbs the human being and causes an harmful effect on the mental and psychological well-being.

Sources of noise pollution

- (i) road traffic noise
- (ii) air traffic
- (iii) rail traffic
- (iv) domestic noise
- (v) Industrial noises

Effects of noise pollution -

- (i) Hearing Damage
- (ii) stress
- (iii) sleep problems
- (iv) Heart issues
- (v) Loss Focus

Control of noise pollution -

- (i) Reduce Traffic Noise
- (ii) Limit Loud Sounds
- (iii) Use Sound Barriers
- (iv) plant Trees
- (v) Control construction

Environmental acts -

- (i) The Wildlife protection act - 1972
- (ii) The water [Prevention and control of pollution] Act - 1974
- (iii) The air [Prevention and control of pollution] Act - 1981
- (iv) The Forest conservation act - 1980

CND The Environment protection act - 1986
CBIJ The Biological Diversity act - 2002

ecology - Ecology is the study of how living things, like plants, animals and people live together and depend on each other in their environment. It helps us understand how nature and how everything is connected.

Biodiversity - Biodiversity means the variety of different plants, animals and other living things in the world. It helps nature stay balanced and healthy. The more types of living things there are, the better it is for the planet.

ecosystem - An ecosystem is a place where living things, like plants and animals interact with each other and their surroundings like air, water and soil. Everything in an ecosystem depends on each other to stay healthy and work together.

Food chain - A food chain shows how living things depend on each other for food. It starts with plants, which are eaten by herbivores [plant-eating animals] and then carnivores [meat-eating animals] eat them. Each step in the chain is connected, and everything helps the

environment stay balanced.

For example -

i. Plants → ii. Herbivores → iii. Carnivores.

Hydrological cycle-

- a) Evaporation - evaporation is when the sun heats up water, like in oceans or lakes, and turns it into steam or vapour that goes up into the air.
- b) Transpiration - Evaporation is also happening from plants through a process called transpiration where plants release water vapour from their leaves into the air.
- c) Condensation - water vapour from evaporation and transpiration gets condense from clouds. In this process conversion of a vapour or gas to a liquid.
- d) Precipitation - precipitation is when water falls from the sky. In form of rain, snow or hail. It happens when clouds get full of water.
- e) Surface runoff - surface runoff is when overwater flows over the ground into rivers

Page No. _____
Date _____

takes and occurs instead of soaking into the soil.

(v) Infiltration - some part of the water get infiltrant into the ground.

Phosphorus cycle -

Step-1 phosphorus ions are available in rocks. At the time of weathering action rock releasing inorganic phosphorus ions.

Step-2 Water carry (takes) the inorganic phosphorus in deposits insol. There is combine by plant and from there to it reaches in human body and animals

Step-3 Its then convertible into organic form In the process of DNA formation

Step-4 At the time of death of animals the organic phosphorus comes out into the atmosphere and there bacteria converts it inorganic phosphorous.

Step-5 Then it is taken away by the water and sedimented somewhere else.

Nitrogen cycle -

Step-1

Nitrogen is available in maximum quantity in atmosphere. It can not be consumed directly by plants or animals. Therefore it has to be fixed. The fixation of nitrogen can be achieved by following.

- (i) Atmospheric fixation - When weathering action such as lighting, raining convert the atmospheric nitrogen into nitric acid and its oxidation form NO_3^- and NO_2^- .
- (ii) biological - Some of the bacteria like Rhizobium consume the nitrogen and decompose into NO_3^- and NO_2^- .
- (iii) Industrial - Industrial are sources of release of ammonia into the atmospheric

Step-2 Assimilation - After fixation, NO_3^- and NO_2^- ions present in soil are consumed by plant and then by human. Then it converted into organic forms in protein formation.

Step-3 Ammonification - At the time of dead of animals and plants this organic protein comes out from human body, also urination and other activities releasing ammonia into the atmosphere.

Step-4 Nitrification - These proteins and other organic compound

are decomposed into NO_3^- and NO_2^- by some bacteria.

Step 3. Denitrification - The NO_3^- and NO_2^- are further decomposed into inorganic nitrogen by the help of bacteria. This process is known as denitrification.

Water Quality standards -

Water

Qualities

(i) Drinking water

- pH between 6.5 - 8.5
- Dissolved Oxygen - 6 mg/l
- Biochemical Oxygen Demand 5 days
 20°C 2 mg/l or less

(ii) Outdoor bathing

- pH between 6.5 - 8.5
- Dissolved Oxygen - 4 mg/l
- Biochemical Oxygen Demand 5 days
 20°C 3 mg/l or less

(iii) propagation of wildlife

- pH between 6.5 - 8.5
- Dissolved Oxygen - 4 mg/l
- Free ammonia - 1.2 mg/l or less

(iv) Industrial

- pH between - 6.0 - 8.5
- Sodium absorption 26
- BOD - 2 mg/l

qualities of Drinking water -

- pH \rightarrow 6.5 - 8.5
- TDS \rightarrow 2000mg/l
- Hardness - 600mg/l
- copper - 1.5
- calcium - 200 etc.

wastewater treatments process - The waste water can be treated in following steps and the treatment plant.

① collection of waste water - waste water from households can be collected by means of sewerties and provided by municipality authorities or housewives. These sewerties are then directed to the treatment plants

② colour control - The waste water supply and the treatment plant contains lots of brown smell and these are removed by means by chemicals

③ Screening - This is first step of treatment in which waste water is passed through large size screening mesh to remove large size objects such as cotton buds, treeleaves or plastic bottles, polythines etc.

④ Grit chamber - It is large sizes containers in which

velocity of flow of waste water is controlled in such a way so that heavy soil particles settled at the bottom of the tank, which is further removed.

(b) Primary treatments - waste water from grit chamber its further transported into primary tanks for latter formation. To collect all the suspended particulates oil and grease at the surface which is then skimmed off.

(c) Secondary treatments - This process also called activated sludge process. In this process oxygen is blown in aeration tanks which further creates to growth of bacteria and microorganism which are then removed

(d) Disinfection - The waste water receiving aeration tanks is 99.9% clean but still have found smell which is then disinfected by supply of chlorine

Solid waste - Solid waste is any unwanted or discarded material that is in solid form. This includes things like paper, plastic, food scraps, old furniture, and clothes

Classification of solid waste

① Domestic waste - This includes the waste from residential, household such as waste from Kitchen, washroom waste and garbage etc.

② Industrial - This refers the waste from various type of industries such as chemicals, manufacturing and production

③ Construction waste - It includes debris, bricks, cements and stones, iron, aluminum etc

④ Biomedical waste - The waste generated from clinics, hospital, dispensaries are called bio medical waste and it includes sponges, bandages, cotton swab and tablets waste etc.

⑤ Agricultural waste - It includes crops and latiburs etc.

⑥ E-waste - It includes the all types of electronic waste such as battery, cells, wires, tape recorder and speakers etc.

⑦ Nuclear waste - It refers to radioactive materials used to generate nuclear power or nuclear weapons.

Solid waste management - There are five functional components of the waste

management system as outlined below:

(1)

Waste collection - A collection of waste refers to the process of gathering trash, unwanted items or materials that are no longer useful. This waste can come from houses, business, factories or other places.

(2)

Storage of solid waste - Storage of solid waste means keeping trash in a safe place until it can be properly disposed of or recycled. It is usually stored in bins, containers, or storage areas to prevent pollution and keep the environment clean.

(3)

Waste transfer and transport - Waste transfer and transport is the process of moving collected waste from one place like your home or a collection point, to a disposal site, recycling center, or landfill. Special trucks or vehicles are used to carry the waste safely.

(4)

Waste processing and recovery - It is the method of turning waste into useful materials or energy. Processing involves sorting, cleaning or breaking down waste, while recovery focuses on finding ways to reuse or recycle its

⑤ Disposal - Disposal is the final step of getting rid of waste. It means safely throwing away trash or unwanted items usually by sending it to a landfill, recycling center, or waste treatment facility. Proper disposal helps keep the environment clean and safe.

Green house effect - The greenhouse effect happens when gases in the earth's atmosphere; like carbon dioxide, trap heat from the sun. This keeps the planet warm enough to support life. However, too many greenhouse gases can cause the earth to get too hot, leading to climate change.

Ozone depletion - It refers to the thinning or loss of the ozone layer in the Earth's atmosphere. The ozone layer protects us from harmful ultraviolet (U.V.) rays from the sun. When chemicals like CFCs are released into the air, they break down the ozone, making it less effective and harmful to living things.

Global warming - It is gradual increase in Earth's temperature due to the buildup of greenhouse gases, like carbon dioxide, in the atmosphere. These gases trap heat from the sun, causing the planet to warm up. This leads to changes in climate, like melting ice and extreme weather.