



CHAPTER- 18

POLLUTION OF AIR AND WATER

Notes:

Pollution

Pollution is the introduction of harmful materials into the environment. These harmful materials are called pollutants.

Air pollution

It is the contamination of air by unwanted substances which may have a harmful impact on the living organisms and the nonliving organisms.

Carbon dioxide, carbon monoxide, nitrogen oxides, methane and sulphur dioxide are the major pollutants of air.

Causes of air pollution

- Air pollutants from natural source: Sometimes smoke and dust arising from forest fire or volcanic eruption cause air pollution.
- Burning of fire woods, dung cakes, coal and kerosene in house emit carbon dioxide and smoke.
- Automobile exhausts: Burning of fuels such as petrol and diesel in vehicles produce high levels of pollutants like carbon monoxide, carbon dioxide, nitrogen oxides and smoke causing air pollution.
- Exhaust from factories: Factories, petroleum refineries and power plants release gaseous pollutants like sulphur dioxide and nitrogen dioxide and decrease the quality of the air.
- Automobiles, steel making industry and mining produce tiny particles which remain suspended in air for long periods and cause pollution of air.
- Air conditioners, refrigerators and aerosol sprays release chlorofluorocarbons (CFCs) and damage the ozone layer.

Effects of air pollution

- Carbon monoxide gas produced from incomplete burning of fuels such as petrol and diesel is a poisonous gas. It reduces oxygen carrying capacity of blood.
- Smoke combines with other air pollutants and fog to form smog. This smog causes breathing difficulties such as asthma, cough and wheezing in children.
- Sulphur dioxide can cause respiratory problems, including permanent lung damage.
- Chlorofluorocarbons (CFCs) damage the ozone layer which protects us from ultraviolet radiations.
- Tiny particles produced from automobiles and, industrial processes, power plants, etc. remain suspended in air for long periods. These particles reduce visibility. When inhaled, they cause diseases.
- Air pollution cause acid rain and also global warming.

Acid rain

Burning of fossil fuels such as coal and petroleum release a variety of pollutants like sulphur dioxide and nitrogen dioxide react with water vapour present in the atmosphere to form sulphuric acid and nitric acid. These acids drop down with rain, making the rain acidic. This is called acid rain.

Effects of acid rain

- Acid rain damage crops and the soil.
- Acid rains corrode buildings and monuments.

Green house effect

- It is a natural process of keeping the earth warm. When solar radiation reaches the earth's surface, a part of it is absorbed by it and a part is reflected back into the space. The reflected radiation is trapped by certain gases called green house gases present in the atmosphere. The trapped radiations further warm the earth. **Green house gases** include carbon dioxide, methane, nitrous oxide, water vapour etc.
- However, due to excess level of carbon dioxide and other green house gases in the atmosphere due to various human activities such as deforestation and burning of fossil fuels, the average temperature of the earth's atmosphere is gradually increasing. This is called **global warming**.

- Global warming cause sea levels to rise flooding coastal areas due to melting of glaciers.
- It could result in wide ranging effects on rainfall pattern, agriculture, forest, plants and animals.

Prevention of air pollution

- Use of clean fuels like CNG (Compressed Natural Gas) and unleaded petrol in automobiles
- Use of alternative fuels such as solar energy, hydropower and wind energy instead of the fossils fuels for our energy requirements.
- Planting trees and nurture the ones already present in the neighbourhood.
- Dry leaves should be put in the compost instead of burning them.

Water pollution

Water pollution is the contamination of water by substances harmful to life.

Causes of water pollution

- Disposal of untreated sewage into the rivers and other water bodies.
- Throwing of large quantities of garbage, plastics, dead bodies of animals, humans and many other harmful things into the rivers, lakes etc.
- Discharge of harmful chemicals from industrial units and factories directly into rivers and streams.
- Fertilizers, pesticides and weedicides used in agriculture are washed into the water bodies from the fields.
- Release of hot water from power plants and industries raise the temperature of the water body adversely affecting the animals and plants living in it.

Effects of water pollution

- Discharge from industrial units and factories cause chemical contamination of water with arsenic, lead, fluorides, etc. which leads to toxicity in plants and animals.
- The soil also gets affected causing changes in acidity, growth of worms etc.
- Excessive quantities of chemicals in the water which get washed from the fields cause algae to flourish. When these algae die, they serve as food for decomposers like

bacteria. A lot of oxygen in the water body gets used up. This results in a decrease in the oxygen level which may kill aquatic organisms.

- Water contaminated with sewage may contain bacteria, viruses, fungi and parasites which cause diseases like cholera, typhoid and jaundice.
- Hot water released from power plants and industries raises the temperature of the water body, adversely affecting the animals and plants living in it.

Potable water

Water which is purified and fit for drinking is known as potable water.

Methods of obtaining potable water

- (i) Using of water filters such as candle type filter.
- (ii) Boiling of water.
- (iii) Chlorination: It is done by adding chlorine tablets or bleaching powder to the water.

Prevention of water pollution

- Laws for industrial units should be strictly implemented so that polluted water is not disposed off directly into rivers and lakes.
- Water treatment plants should be installed in all industrial areas.
- At individual levels we should consciously save water and not waste it. Reduce, reuse and recycle should be our mantra.

Water is a precious natural resource. We must learn to conserve it.



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