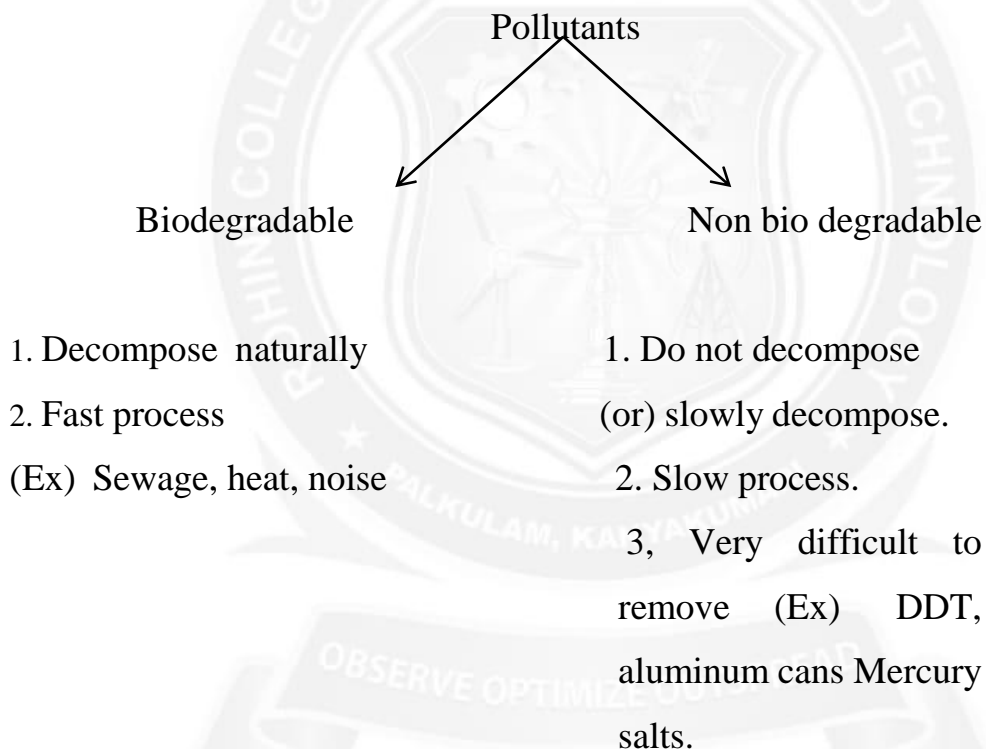


UNIT-II**ENVIRONMENTAL POLLUTION****INTRODUCTION**

The Unfavorable alternation of our surroundings is called pollution.

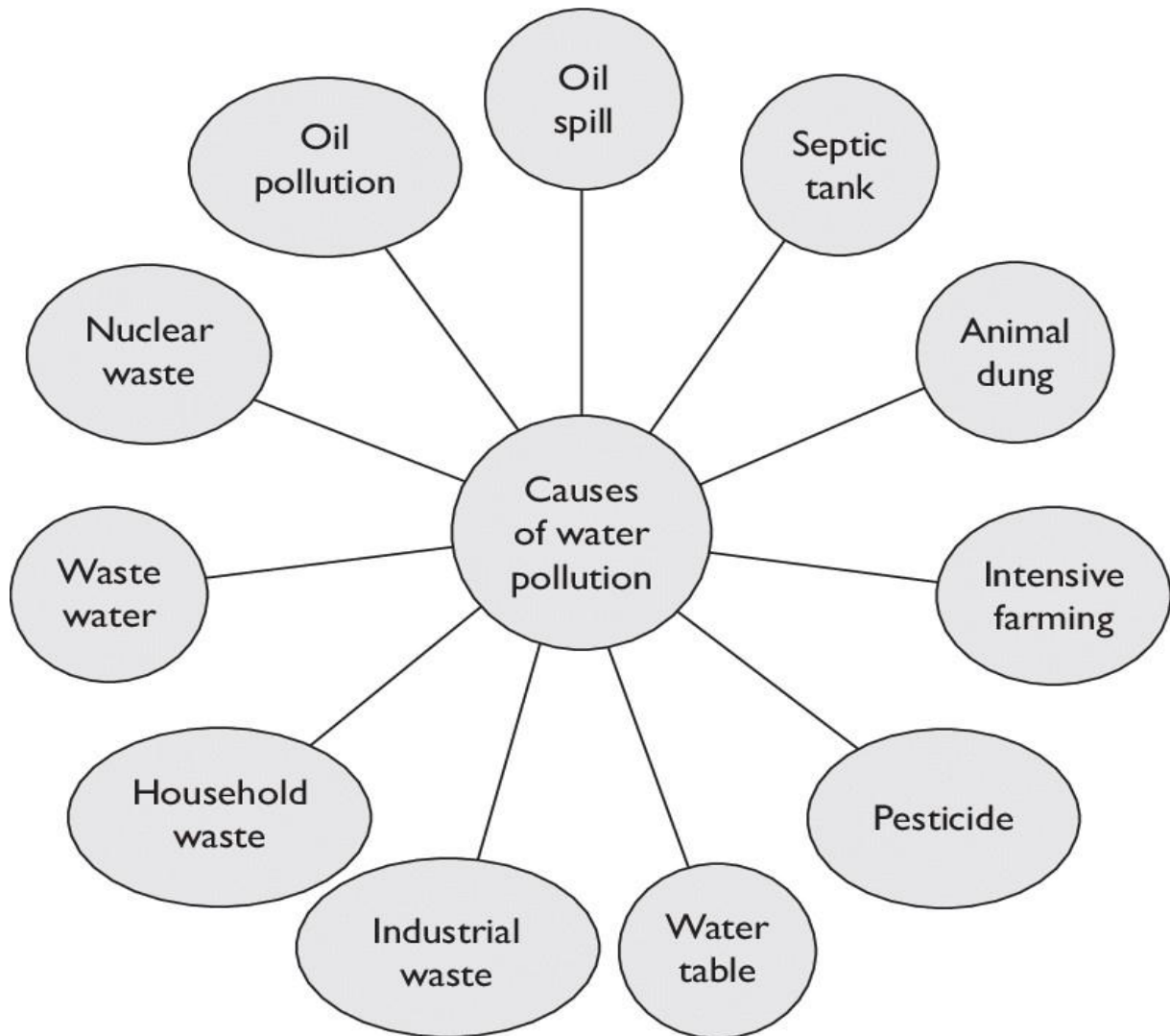
It changes the quality of air, water, land which interfere with human being health & other life on the earth. Depends on the nature of pollutant, generated from various sources, pollution are in many kinds. (Ex) pollutants from industry, thermal & nuclear power plants, domestic wastages, chemical fertilizers, insecticide.

**Types of pollution**

1. Air pollution
2. H₂O pollution
3. Soil pollution
4. Marine pollution
5. Noise pollution
6. Thermal pollution
7. Nuclear hazards.

WATER POLLUTION

The alteration in physical, chemical, and biological characteristics of water, which may produce harmful effects to humans and aquatic life.



Water pollutants

1. Domestic sewage
2. Industrial pollutants
3. Pesticides
4. Herbicides
5. Fertilizers

6. Plankton blooms
7. Silt
8. Radio activity
9. Bacteria & Virus
10. Oils.
11. Temp

Causes of water pollution

1. Domestic sewage

The city sewage is released into the river. Domestic sewage consists of human feces, urine and dirty used-up water in houses. It contains a large no of pathogenic bacteria & Virus.

2. Industrial effluents

All industrial plants produce some organic & inorganic chemical wastes. The non-usable chemicals are dumped in H₂O. The industrial waste include heavy metals (Hg, Cu, Pb, Zn), detergents, petroleum, acids, alkalies, phenols, carbonates, alcohol, cyanides, chlorine.

3. Thermal pollution

Many industries use water for cooling process. so, the resultant warm H₂O is discharged into rivers. This brings about thermal pollution.

4. Fertilizers

The fertilizers used for crops are washed into ponds and rivers.

5. Pesticides

Pesticides are used to control pests in fields and houses. They include DDT, BHC, Endrin.

6. Radio active wastes

Liquid Radio active wastes are released into the sea around nuclear installations. The oceanic currents carry the radio active contaminants every

where.

7. Oil pollution

Oil pollution is due to ship accidents, loading & discharging of oil at the harbor, oil refineries.

8. Retting

The process of decaying coconut husk to get fiber for making coir is called retting. Retting releases H_2S . It makes water pollution.

Consequence of water pollution

1. Water-borne Diseses

Diseases like jaundice, cholera, typhoid, diarrhea, are transmitted through contaminated water.

2. Poor oxygenation

Oil present on the surface of water prevent water oxygenation. This reduces respiration & metabolism in aquatic organisms.

3. Poor photosynthesis

Oil pollution prevent photosynthesis in phyto plankton.

4. Biochemical oxygen demand (BOD)

BOD is the amount of oxygen required by the micro organisms in H_2O . BOD is higher in polluted H_2O and lesser in drinking H_2O . Increased BOD, reduces the dissolved oxygen in H_2O , causing death of aquatic flora & fauna.

5. Reduction in productivity

Intensive agriculture increases the amount of silt in lakes & river. Silt prevents the penetration of light to depths and thus reduces primary production.

6. Eutrophication

The increased productivity of lakes & ponds brought about by nutrient enrichment is known as eutrophication. Because, domestic sewage & fertilizers

contain large quantities of nutrients, which induces the growth of algae. The rapid growth also consumes all nutrients & oxygen in H₂O.

7. Diseases.

The chemical contaminants in H₂O make the fresh water is unfit for drinking purpose. Causes skin cancer, neck damage, damage the nervous system, liver & kidney.

Control of water pollution

1. The sewage H₂O should not be allowed into river, pool, reservoirs.
2. The sewage H₂O should be collected in separate tanks, and treated & recycled.
3. Rain water should not be allowed to enter sewage drainage.
4. Pesticides & chemical fertilizers should be used in the limited way.
5. Bio fertilizers like blue-green algae are used instead of chemical fertilizers.
6. Nitrogen fixing green plants are used to improve the fertility of soil.
7. Surface run off of manure and fertilizers are allowed in the fields.
8. Water should be properly chlorinated.
9. Suitable laws, standards & practices should be framed to regulate the discharge.
10. The administration of water pollution control should be in the hands of state (or) central government.
11. Adopting the necessary scientific techniques for the environmental control of catchment areas of rivers, ponds (or) streams.

Drinking water quality

The public health for drinking water, US recommended the following specification for drinking water.

1. The water should be crystal clear.
2. Colourless.
3. Odourless.

4. Free from disease causing bacteria.
5. Turbidity should not exceed 10ppm.
6. The pH should be in between 7-8.5.
7. Total hardness should be less than 500ppm
8. Total dissolved solids should be less than 500ppm
9. The fluoride content should be less than 1.5ppm
10. There should be no H₂S in the water.
11. Pb,Cr,Mn.Ar salts should not be present in the H₂O.

Sewage → waste of domestic (or) industrial origin

Sanitary Sewage → domestic wastage + industrial wastage
Sewer → waste carried pipe

Sullage → waste water from bathroom

Garbage → degradable solid waste, mostly organic partially inorganic

Drainage → the run off from roads, buildings and other catchment areas

Soil pollution

Def: The contamination of soil by human and natural activities which may cause harmful effects on living beings.

Soil pollutants

- | | |
|-------------|---------------------------------|
| 1. Plastic, | 5. Broken glasses |
| 2. Rubber | 6. Radio active elements |
| 3. Leather | 7. Dead animals |
| 4. Cloth | 8. Pesticides, Herbicides, etc. |

Causes of soil pollution

1. Industrial wastes:

Disposal of industrial wastes is the major problem for soil pollution.

Industries like pulp & paper mills, chemical industries, sugar factories, fertilizer, coal & mineral mining industries disposed their wastes into land.

2. Urban wastes:

Urban wastes consist of both commercial & domestic wastes. It is a dried sludge of sewage. Sewage contain glasses, metallic cans, fibers, fuel residue and other discarded products. This waste products are not easily decomposed.

3. Agricultural practices:

Modern agricultural method pollute the soil to a large extent. Based on agrotechnology a large quantities of fertilizers, pesticides, herbicides, weedicides are added to increase crop yield. These inorganic chemicals pollutes the soil.

4. Radio active pollutants:

Radio active pollutants are coming from nuclear dust explosion, nuclear testing labs & industries. These pollutants penetrate into the soil and accumulate there by creating land pollution.

5. Biological agents:

Soil gets large quantities of human, animal & birds excreta which is the major source of land pollution by biological agents.

Municipal sewage, waste water and wrong method of agricultural practices also induce the heavy soil pollution.

Consequences of soil pollution

1. Bad smell: The waste from hotels, houses, dead animals, garbage , floating materials release unbearable bad smell.
2. Dirty surroundings: The dumping of wastes on the streets and road sides spoils the aesthetics of the site.
3. Insecticides: It induce gene mutation in human being
4. Cancer: Chromium & DDT cause cancer in human tissues
5. Sex hormones: DDT in the soil affects sex hormones in mammals & birds

6. Decline of reproduction: Due to the accumulation of DDT in soil reduces the reproduction capacity of the mammals & birds.
7. Bio magnification: Increasing accumulation of pesticides in higher organisms is called biomagnification.

Control of soil pollution

1. Reduction, Recuse, Re-cycle principles helps to control and prevent the soil pollution.
2. Soil erosion: Soil erosion is controlled by planting more trees, strip cropping, contourcultivation, constructing diversion channels.

3. Proper dumping of unwanted materials:

Kitchen wastes are dumped into municipal waste container kept on the sides of streets.

4. Solid wastes of kitchen, municipality, hospital, broiler, houses, agriculture are treated by the following methods .

a, Land fill- Burying under ground

b, Composting - making manure, Incineration - Burning

5. Pesticides are used in the limited amount.
6. Biological pesticides & fertilizers are used instead of chemical fertilizers.
7. Land sliding & water logging is prevented.
8. Sewage water must be treated by primary, secondary and tertiary treatment steps.
9. People should be trained regarding the sanitary habits.
10. Government should ban some important toxic chemical like DDT, BHC which cause the soil pollution.