Environmental pollution

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CHE 110: Environmental Studies

Unit - 4

Environmental pollution

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Water Pollution

- The addition of various organic and inorganic substances that change the
- Physical and chemical properties of water thereby leading to detrimental effects on living organisms and reducing water usability is termed as *water pollution*.

Sources of water pollutants

Water pollutants come from?

- Point sources
  - Pollutants enter the water at a single point-- sewage treatment plant and factories.
  - Sewage treatment plant, factories are point source that discharge pollutant through pipe
  - These can be regulated through law
  - Easy to control
- Non point source
  - Pollutants enter the water over large areas—
    - Surface run off, mining wastes, municipal wastes, acid rain and soil erosion.
  - surface runoff, mining waste, Construction sediments, Municipal waste
  - Difficult to control

Causes of Water Pollution

- **In a simple sense, water pollution is the adding to water of any substance, or the changing of water's physical and chemical characteristics in any way which interferes with its use for legitimate purposes.**

Natural causes

- Soil eroded by rains
- Dead and decay of vegetation and dead organisms
- High speed winds and Floods

Man made causes

- Sewage and other wastes Industrial waste
- Agricultural waste
- Human activities
- Customs and traditions

Delhi contributes 3296 MLD of sewage to the river, more than the sewage generated by all class II cities of India together

Water Pollutants

- **Sediments**
  - Excessive amounts of soil particles carried by flowing water, when there is severe soil erosion.
- **Oxygen-demanding wastes**
  - Organic waste such as animal manure and plant debris that are decomposed by bacteria, from sewage, animal feedlots, paper mills, and food processing facilities.
- **Infectious microorganisms**
  - Parasitic worms, viruses and bacteria from infected organisms as well as human and animal wastes.
- **Organic compounds**
  - Synthetic chemicals containing carbon from industrial effluents, surface runoff, and cleaning agents.

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- **Inorganic nutrients**
  - Substances like nitrogen and phosphorus from animal waste, plant residues, and fertilizer runoff.
- **Inorganic chemicals**
  - Acids, salts, and heavy metals like lead and mercury from industrial effluents, surface runoff, and household cleaning agents.
- **Radioactive substances**
  - Wastes from nuclear power plants, nuclear weapons production, mining and refining uranium and ores.
- **Thermal pollution**
  - Hot water from industrial processes.

Effects of water pollution

- Adverse effects on human health
- Loss of aquatic biodiversity
- Disruption of aquatic ecosystem
- Loss of scenic beauty
- Leads to various waterborne diseases such as
    - Diarrheoa,
        - Typhoid,
            - Cholera,
                - Infectious hepatitis,
                    - Jaundice, etc., in human beings
- Eutrophication of water bodies
- Excess of nitrates and phosphates

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- Effects on animals-
  - *Harmful chemicals and pollutants in water effect survival of aquatic organisms--* *Loss of aquatic biodiversity*
- Effects on plants-
  - Nitrate and phosphate fertilizer used to increase nitrogen and phosphate content of soil goes in water and increases the growth of certain plants on surface of water body--**Eutrophication of water bodies**
  - Polluted water contains high concentration of heavy metals becomes toxic for plants.

Pollution of Groundwater

Excessive extraction of groundwater leads to the natural pollution of groundwater. Examples are fluoride and arsenic contamination.

Groundwater receives pollutants from septic tanks, landfills, hazardous waste dumps, and underground tanks containing petrol, oil, chemicals, etc.