



**Cardamom Planters' Association College
(Re-accredited with 'B' Grade by NAAC)
Pankajam Nagar, Bodinayakanur - 625 582.**

ENVIRONMENT MANAGEMENT

Pollutants and Types of pollution

Dr. B. Kavitha

Assistant Professor

PG and Research Department of Chemistry

C.P.A. College, Bodinayakanur

Pollutants

Pollutants are the main elements of pollution which are usually waste materials of diverse types. Environmentalists consider that pollution can disturb our ecosystem and also the steadiness in the environment. With modernization and urban growth, the rise of factories across the world, the development in the field of technology, the increasing use of vehicles and growth in our lives, pollution has hit the highest point. Environmental pollution is a primary reason for giving rise to global warming and many of the incurable human diseases. Pollution happens in different forms such as air, water, soil, radioactive, light, noise, and heat.

Types of pollution

The effects of pollution are undoubtedly many and extensive. Extreme levels of pollution are causing scores of harm to human health, animal health, tropical rainforests, as well as the large environment. All kinds of pollution including air, water, soil pollution, etc. have an impact on the environment. Following are main **types of pollution**:

1. **Air Pollution**
2. **Water Pollution**
3. **Land Pollution (soil pollution)**
4. **Noise Pollution**
5. **Radioactive/ Nuclear Pollution**
6. **Thermal Pollution,**
7. **Light pollution**

Water pollution

Water pollution is one of the most serious environmental problems. Water pollution is caused by a variety of human activities such as industrial, agricultural and domestic. Agricultural run off laden with excess fertilizers and pesticides, industrial effluents with toxic substances and sewage water with human and animal wastes pollute our water thoroughly. Natural sources of pollution of water are soil erosion, leaching of minerals from rocks and decaying of organic matter. Rivers, lakes, seas, oceans, estuaries and ground water sources may be polluted by point or non-point sources. When pollutants are discharged from a specific location such as a drain pipe carrying industrial effluents discharged directly into a water body it represents **point source pollution**. In contrast **non-point sources** include discharge of pollutants from diffused sources or from a larger area such as run off from agricultural fields, grazing lands, construction sites, abandoned mines and pits, roads and streets.

Sources of water pollution

Water pollution is the major source of water born diseases and other health problems. Sediments brought by runoff water from agricultural fields and discharge of untreated or partially treated sewage and industrial effluents,

disposal of fly ash or solid waste into or close to a water body cause severe problems of water pollution. Increased turbidity of water because of sediments reduces penetration of light in water that reduces photosynthesis by aquatic plants.

(i) Pollution due to pesticides and inorganic chemicals

- Pesticides like DDT and others used in agriculture may contaminate water bodies. Aquatic organisms take up pesticides from water get into the food chain (aquatic in this case) and move up the food chain. At higher trophic level they get concentrated and may reach the upper end of the food chain.
- Metals like lead, zinc, arsenic, copper, mercury and cadmium in industrial waste waters adversely affect humans and other animals. Arsenic pollution of ground water has been reported from West Bengal, Orissa, Bihar, Western U.P. Consumption of such arsenic polluted water leads to accumulation of arsenic in the body parts like blood, nails and hairs causing skin lesions, rough skin, dry and thickening of skin and ultimately skin cancer.
- Pollution of water bodies by mercury causes **Minamata disease** in humans and **dropsy** in fishes. Lead causes **displexia**, cadmium poisoning causes **Itai – Itai disease** etc.
- Oil pollution of sea occurs from leakage from ships, oil tankers, rigs and pipelines. Accidents of oil tankers spill large quantity of oil in seas which kills marine birds and adversely affects other marine life and beaches.

(ii) Thermal pollution

Power plants- thermal and nuclear, chemical and other industries use lot of water (about 30 % of all abstracted water) for cooling purposes and the used hot water is discharged into rivers, streams or oceans. The waste heat from the boilers and heating processes increases the temperature of the cooling water. Discharge of hot water may increase the temperature of the receiving water by 10 to 15 °C above the ambient water temperature.

This is **thermal pollution**. Increase in water temperature decreases dissolved oxygen in water which adversely affects aquatic life. Unlike terrestrial ecosystems, the temperature of water bodies remain steady and does not change very much. Accordingly, aquatic organisms are adopted to a uniform steady temperature of environment and any fluctuation in water temperature severely affects aquatic plants and animals. Hence discharge of hot water from power plants adversely affects aquatic organisms. Aquatic plants and animals in the warm tropical water live dangerously close to their upper limit of temperature, particularly during the warm summer months. It requires only a slight deviation from this limit to cause a thermal stress to these organisms. Discharge of hot water in water body affects feeding in fishes, increases their metabolism and affects their growth. Their swimming efficiency declines. Running away from predators or chasing prey becomes difficult. Their resistance to diseases and parasites decreases.

Due to thermal pollution biological diversity is reduced. One of the best methods of reducing thermal pollution is to store the hot water in cooling ponds, allow the water to cool before releasing into any receiving water body

Ground water pollution

Lot of people around the world depend on ground water for drinking, domestic, industrial and agricultural uses. Generally groundwater is a clean source of water. However, human activities such as improper sewage disposal, dumping of farm yard manures and agricultural chemicals, industrial effluents are causing pollution of ground water.

Eutrophication

- ‘Eu’ means well or healthy and ‘trophy’ means nutrition. The enrichment of water bodies with nutrients causes eutrophication of the water body. Discharge of domestic waste, agricultural surface runoff, land drainage and industrial effluents in a water body leads to rapid nutrients enrichment in a water body. The excessive nutrient enrichment in a water body encourages the growth of algae duckweed, water hyacinth, phytoplankton and other aquatic plants. The biological demand for oxygen (BOD) increases with the increase in aquatic organisms. As more plants grow and die, the dead and decaying plants and organic matter acted upon by heterotrophic protozoans and bacteria, deplete the water of dissolved oxygen (DO). Decrease in DO result in sudden death of large population of fish and other aquatic organisms including plants, releasing offensive smell and makes the water unfit for human use. The sudden and explosive growth of phytoplankton and algae impart green colour to the water is known as water bloom, or “algal blooms”. These phytoplankton release toxic substances in water that causes sudden death of large population of fishes. This phenomenon of nutrient enrichment of a water body is called **eutrophication**. Human activities are mainly responsible for the eutrophication of a growing number of lakes and water bodies in the country