



Target PT 2020

ENVIRONMENT

PART - 2

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UNIT
1

**POLLUTION &
DEGRADATION**

1. POLLUTION BASICS

Pollution

Pollution is defined as an addition of undesirable material into the environment as a result of human activities. The agents which cause environmental pollution are called pollutants. Pollutants may be defined as a physical, chemical or biological substance unintentionally released into the environment which is directly or indirectly harmful to humans and other living organisms.

Sources of Pollution

- **Point Sources** - These are organised sources of pollution where the pollution load can be measured e.g. surface drains carrying municipal sewage or industrial effluents, sewage pumping stations and sewerage systems, trade effluents from industries etc. Examples: Chemicals coming out of pipes, oil spill from ship, smoke from a factory.
- **Non-point Sources** - These are non-measurable sources of pollution such as run-off from agricultural fields carrying chemicals and fertilizers, run-off from areas used for dumping of solid waste and open defecation, dumping of unburnt/half burnt dead bodies and animal carcasses, dhobi ghats, cattle wallowing, mass bathing, floral offerings etc.

Classification of Pollutants

- **According to the form in which they persist after being released into the environment:**
 - ▶ **Primary Pollutants:** These are pollutants persisted in the environment in the form it is released from the source. e.g., Carbon Dioxide, Nitrogen Oxide, Sulphur dioxide, DDT.
 - ▶ **Secondary Pollutants:** These are formed from primary pollutants through change or reaction after primary pollutants being released into atmosphere. e.g., Nitrogen oxide and hydrocarbons react photochemically to produce PAN (Peroxyacyl nitrates) and Ozone are formed.
- **According their Nature of Degradation:**
 - ▶ **Biodegradable Pollutants:** Those pollutants which can be broken down into simpler, harmless, substances in nature in due course of time (by the action of micro-organisms like certain bacteria) are called biodegradable pollutants.

Example: Domestic wastes (garbage), urine, sewage, agriculture residues, paper, wood, cloth, cattle dung, animal bones, leather, wool, vegetable stuff or plants are biodegradable pollutants.
 - ▶ **Non-Biodegradable Pollutants:** Those pollutants which cannot be broken down into simpler, harmless substances in nature, are called non-biodegradable pollutants.

Example: DDT, plastics, polythene, bags, insecticides, pesticides, mercury, lead, arsenic,

metal articles like aluminum cans, synthetic fibers, glass objects, iron products and silver foils are non-biodegradable pollutants.

● **According to their Existence in Nature:**

- ▶ **Quantitative Pollutants:** These are those substances normally occurring in the environment, which acquire the status of a pollutant when their concentration gets increased due to the activities of man.

For example, carbon dioxide, if present in the atmosphere in concentration greater than normal due to automobiles and industries, causes measurable effects on humans, animals, plants or property, and then it is classified as a quantitative pollutant.

- ▶ **Qualitative Pollutants:** These are those substances which do not normally occur in nature but are manmade. For example, Insecticides, Fungicides, Herbicides, DDT, etc.

● **According to the Origin of Pollutants:**

- ▶ **Natural Pollutants:** These are the pollutants emitted by natural processes.
- ▶ **Anthropogenic Pollutants:** These are pollutants caused by manmade activities.

→ **Pollution Indicator Species**

A species of organism that can indicate an area of pollution by its presences or absence in that specific area.

● **Lichen**

Lichens are plants that grow in exposed places such as rocks or tree bark. They need to be very good at absorbing water and nutrients to grow there. Rainwater contains just enough nutrients to keep them alive. Air pollutants dissolved in rainwater, especially sulfur dioxide, can damage lichens and prevent them from growing. This makes lichens natural indicators of air pollution.

● **Indicator of Water Pollution**

Water pollution is caused by the discharge of harmful substances into rivers, lakes and seas. Many aquatic invertebrate animals cannot survive in polluted water, so their presence or absence indicates the extent to which a body of water is polluted.

Indicator species for levels of water pollution

Level of Water Pollution	Indicator Species
Clean	Mayfly Larva
Low	Freshwater Shrimp
High	Water Louse
Very high	Rat-tailed Maggot, Sludgeworm

● **Fish Survival and Water Oxygen**

One simple way to measure the health of a given water source is to examine the survival of fish in that source of water. Fish rely heavily on the dissolved oxygen in water to survive, so if oxygen levels are low due to pollution, no varieties of fish will survive.
