

# SOIL POLLUTION

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# Definition

Soil pollution refers to the contamination of soil with abnormal concentrations of toxic substances.

Although soils contain several type of substances which are harmful to human beings and other living organisms but usually their concentration is low enough and they do not pose any risk.

# Types of soil pollution

- ▶ Natural soil pollution : Deposition of pollutants through wind or rain water.
- ▶ Anthropogenic soil pollution: Due to human activities such as demolition of old buildings, oil spillage during transportation, underground mining, metal casting, landfills containing hazardous substances, sewage disposal, chemical pesticides etc.

# Causes of soil pollution

- ▶ Agricultural activities
- ▶ Industrial activity
- ▶ Improper management and disposal of waste

# soil pollutants

- ▶ Xenobiotic substances (Xeno=foreign)

Substances which are produced by human beings and are not naturally found in soil.

# Heavy metals

- ▶ arsenic
- ▶ Mercury
- ▶ Lead
- ▶ Antimony
- ▶ Nickel
- ▶ Zinc
- ▶ Cadmium
- ▶ Beryllium
- ▶ Selenium
- ▶ Thallium

# Polycyclic aromatic Hydrocarbons

- ▶ Naphthalene
- ▶ Anthracene
- ▶ Phenalene

# Industrial wastes

- ▶ Chlorinated industrial hydrocarbons
- ▶ dioxins
- ▶ polychlorinated biphenyls
- ▶ plasticizers / dispersant
- ▶ Hydrocarbons released by petroleum industries



# pesticides

- ▶ **Herbicides** such as triazines, carbamates, amides, aliphatic acids etc.
- ▶ **Insecticides** such as Organophosphates, chlorinated hydrocarbons, pyrethrum, arsenic containing compounds etc.
- ▶ **Fungicides** such as Mercury containing compounds, thiocarbamates, copper sulfate etc.

# Effects of soil pollution

Soil pollution causes several problems

1. Health hazards for human beings
2. Plant soil related problems
3. Effects on ecosystem

# Human health problems

- ▶ **Diseases** of immune system, central nervous system, cancer and birth abnormalities etc
- ▶ **Short-term effects** include headache, nausea, vomiting, coughing, skin and eye irritation, fatigue, weakness etc.

# Plant and ecosystem

- ▶ Plants are also affected due to soil pollution. They accumulate the various pollutants present in soil. This results in abnormal growth of plants. It also causes many types of plant diseases. It also results in the extinction of many species of plants and plant friendly animals.
- ▶ Soil pollution causes risk to ecosystem also. The various pollutants present in soil enter the food chain. Through this food chain the harmful pollutants reach the human beings and animals in hazardous concentrations.
- ▶ Soil quality and texture gets disturbed.
- ▶ Soil pollution results in development of acidic soils which are not fit for agriculture.
- ▶ Fertile land get converted to “usar” or “banjar” land .

# Control of soil pollution

- ▶ **Thermal remediation** : in this technique the temperature of the soil is raised so that the pollutants get vaporized.
- ▶ **Bioremediation or phytoremediation** : in this technique plants or microorganisms are used in order to decontaminate the soil.
- ▶ **Mycoremediation** : In this method fungi are used which accumulate many of the heavy metals from the soil.
- ▶ **Excavation and subsequent transport of polluted soil.**

**THANKS**

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