

## Lesson-27 Pollution

Over-exploitation of resources and human activities have resulted in many environmental problems, such as deforestation, destruction of wild life, air, water, land and noise pollution, diminishing fossil fuels (oil, coal and natural gas), concentration of pesticides in alarming proportions in the bodies of organisms, and depletion of ozone layer and global warming. In this lesson, you will learn about various kinds of environmental pollution, their causes effects and control

- The addition of unwanted substances in a concentration that has an adverse effect on organisms and environment is called **pollution**.
- A pollutant is a constituent which when added adversely affects the environment.

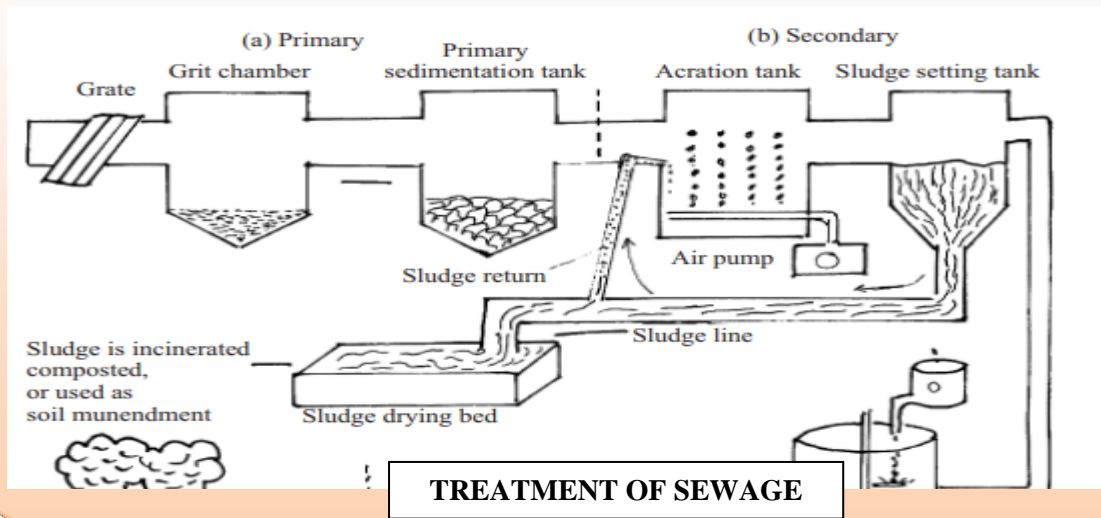
**Pollution** may be of different types such as Air, Water, Soil, Noise, and Thermal or because of radiations.

Pollution		
<p><b>Air Pollution</b></p> <p><b>Some major air pollutants</b> are Carbon dioxide, Sulphur dioxide, carbon monoxide, Fluorides, Oxides of nitrogen, Smog, Aerosol spray propellants, and Domestic air pollutants</p>	<p><b>Water Pollution</b></p> <p>Addition of undesirable substances in water is called <b>water pollution</b>.</p> <p>Water may be polluted by domestic, agricultural or industrial activities</p> <p><b>Natural sources</b> of water pollution are soil erosion, leaking of minerals from rocks, and decaying of organic matter, while <b>human-made sources</b> include domestic, agricultural and industrial activities</p>	<p><b>Soil Pollution</b></p> <p>Soil pollution may be caused due to pesticides, radioactive wastes, domestic wastes etc.</p> <p>Addition of these substances that change the quality of soil by making it less fertile and unable to support life is called soil pollution.</p>

- Air pollution caused by suspended particular matters may be controlled by use of fabric filter, electrostatic precipitators and by planting vegetation.
- At domestic level, burning of wood and dung cakes can be replaced by use of cleaner fuel and biogas use of unleaded petrol and CNG, installation of tall chimneys.

- Entry of harmful non-biodegradable chemicals in small concentrations and their accumulation in greater concentrations in the various levels of food chain is called **Biomagnification**
- The enrichment of water with nutrients such as nitrates and phosphates that triggers the growth of green algae is called **Eutrophication**. This fast growth of algae followed by decomposition depletes the water body of its dissolved oxygen. As a result aquatic animals die of oxygen shortage.

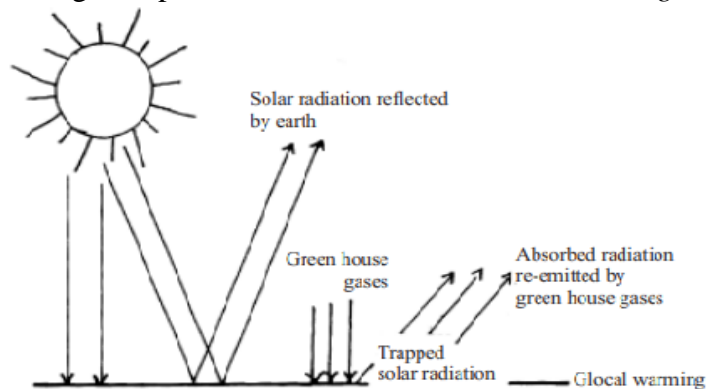
Treating industrial effluents before discharging into rivers, separate channels for river and sewage water and also by avoiding contamination of rivers, lakes and ponds by washing clothes, bathing, etc. The sewage can be treated by a modern technique involving three steps—



- **Soil Erosion** The process of detaching and removal of loosened soil particles by water (running water, ground water, rain, sea waves) and wind is known as soil erosion.
- **Noise pollution** can be simply defined as “unwanted sound”. It is generally higher in urban and industrial areas than in rural areas. Intensity of sound is measured in a unit called decibel or dB. The lowest intensity of sound that human ear can hear is 20 dB.
- Noise is unwanted sound which may cause deafness, lack of concentration, high blood pressure and nervous disorders.

### GREENHOUSE- EFFECT AND GLOBAL WARMING

An increase in the percentage of greenhouse gases which prevent the escape of heat from earth, would increase the average temperature on earth worldwide known as *greenhouse effect*.



- Carbon dioxide ( $\text{CO}_2$ ), Chlorofluorocarbons (CFCs), Methane ( $\text{CH}_4$ ) and Nitrous oxides ( $\text{N}_2\text{O}$ ) are the main greenhouse gases that cause global warming.
- Accumulation of high concentration of carbon dioxide has led to the phenomenon of global warming (due to green house effect), and has resulted in increased earth's temperature.

**Ozone** provides a protective layer against harmful ultra-violet rays coming from the sun. Excessive use of chemical, such as CFCs used in spray cans, gas used in refrigerators and air conditioners, lead to thinning of the ozone layer.

**Effects of depletion of ozone layer**

Sunburn, fast ageing of skin, cancer of skin, cataract (opaqueness of eye lens leading to loss of vision), cancer of the retina (sensitive layer of the eye on which image is formed) Genetic disorders.

**Acid rain** occurs when Sulphur dioxide ( $\text{SO}_2$ ) and oxides of Nitrogen ( $\text{NO}_x$ ) are emitted into the atmosphere, undergo chemical transformations and are absorbed by water droplets in clouds. This causes the formation of sulphuric and nitric acids in rain clouds. The droplets then fall to earth as rain, snow or mist. If rain falls through polluted air it picks up more of these gases and increases its acidity. This is called acid rain.

- Radiation has also become a major factor causing environmental pollution.
- Radiations emitted by nuclear substances or wastes (fallout) or from atomic power plant or an atomic explosion cause nuclear radiation.
- By entering food chain they also get accumulated in high concentration in the body of the top consumer causing harmful effect on the health of both humans and animals.

**Test Yourself**

1. Mention the sources of Sulphur compound pollutants? What are the harmful effects that passed on to environment by those pollutant materials?
2. Write a note on acid rain?
3. How does Biological magnification differ from Eutrophication?