# **Our Environment**

Soil

Soil is the uppermost layer of the earth's crust. Soil is formed by the weathering of rocks. The weathering of rocks takes place as a result of natural factors such as temperature change, rain and wind. Soil supports growth of plants.

Layers of Soil

Soil consists of layers. Layers of soil are called horizons. The various layers of soil are:



A-horizon: This is the uppermost layer of the soil. This layer is also called topsoil. It is dark in colour due to the presence of humus.

B-horizon: This layer is below the topsoil and is called subsoil. This soil is lighter in colour. The particles of this layer are coarser and porous. This layer does not contain much humus and thus not suitable for plants growth.

C-horizon: This layer is below subsoil and is called substratum. This layer is derived from hard rocks that lie beneath it.

R-horizon: This layer is below the substratum. It consists of hard rock called bedrock. Water cannot penetrate the bedrock and thus accumulates in the substratum.

# Components of Soil

Main components of soil are different sized rock particles and humus. On the basis of their sizes, rock particles have been classified into four groups.

Clay: Clays are the smallest rock particles present in the soil. They are smooth to touch.

Silt: Silts are the rock particles which are a little larger than clay particles. Silt particle are not as smooth as clay particles.

Sand: Rock particles which are larger than silt particles form sand. Sand particles have rough texture.

Gravel: The largest rock particles present in the soil form gravel.

# Types of Soil

Sandy Soil: It consists of mainly sand. A little amount of silt and clay are also present in it.

Clayey Soil: It consists of mainly clay particles. Clay particles are very fine so it has very good water holding capacity.

Loamy Soil: Loamy soil consists of clay, silt and sand in right proportion. It also contain sufficient amount of humus. Therefore, loamy soil is the most fertile soil.

# Forests: Our Lifeline

Forests are important for maintaining environmental balance and controlling pollution.

# Functions of Forests

- Maintains balance of gases: Forests maintain the balance of carbon dioxide and oxygen by using carbon dioxide and releasing oxygen.
- Checks pollution: Forests absorb dust and other pollutants. Forests absorb noise and act as barrier against wind.
- Protects soil: The roots of trees bind soil and prevent it from being washed away by rain water or blown by wind. The leaves of tree protect soil from direct rain showers. The leaves that fall get decomposed and make the soil fertile.
- Controls floods and droughts: Forests prevent water from flowing down fast. Thus prevent floods by preventing rivers in the plains from filling up suddenly. This also prevents drought because the water is held by the forests and seeps into the soil and replenishes the groundwater. The availability of groundwater prevents scarcity after the monsoon.
- Controls rain and temperature: The process of transpiration releases water vapour from tree leaves that helps to increase rainfall. The evaporation of water from the leaves also causes cooling.

solid in the polar regions. Water covers about three-fourth of the earth's surface. Only about 2.5% of the water available on the earth is fresh water and suitable for drinking, rest is in the form of oceans as salty water.

## Water Sources

The various sources of water are:

Surface water: Water is available on the earth's surface in the form of rivers, lakes, etc.

Ground water: The rain water gets collected deep inside the layers of the earth as groundwater. Traditionally, wells were used for utilising the ground water. Now a days groundwater is pumped with the help of power operated tube wells.

Rainwater: Rainfall is the primary source of water. It replenishes the surface water and groundwater.

#### Wastewater

Waste water refers to liquid waste and sewage. In urban areas, this type of waste is carried by sewers or underground pipes. The three main sources of waste water are:

### Municipal Waste Water

This is the waste water that comes from homes, offices, etc. and is carried by sewers or sewage pipes. The waste water coming from toilets is referred to as black water and waste water coming from kitchens and bathrooms is called grey water.

### Industrial Waste Water

This waste is also referred to as industrial effluent. This kind of waste is not mixed with municipal waste water and disposed separately. One of the most incorrect way of disposing this waste is to allow it to flow into rainwater drains and ultimately into Water bodies.

#### Rain water

As rainfall runs over the surface of ground, it may mixes with different types of contaminants and animal wastes and forms waste water. The rainwater flows into rainwater drains in urban areas. The rainwater is carried by underground sewers.

### Treatment of Municipal Waste Water

Sewage is carried from sewers to a sewage treatment plant. In the sewage treatment plant, strainers separate large solids such as leaves, rags, plastic, etc.



Then the sewage is passed to settlement tank to settle down the suspended solids to the bottom. The solids settled at the bottom of the settlement tank are called primary sludge. The sludge is used for producing compost and biogas. After this the sewage undergoes secondary treatment. In this, organic matters break down by the action of bacteria. This is done in open tanks called aeration tanks. Aerobic bacteria that needs oxygen act on the sewage in the aeration tanks. Air is blown into these tanks to speed up the process.

Sometimes the organic matters in the sewage break down by anaerobic bacteria in closed tanks. The solids get settled at the bottom of tank by the action of bacteria and are called biological or secondary sludge.

The sewage further undergo tertiary treatment before being discharged into water bodies. In this, the sewage passes through sand filters, man-made ponds containing reeds and other organisms that clean out dissolve chemicals.

