Chapter- 02

LAND, SOIL AND WATER RESOURCES

STUDY NOTES

Land

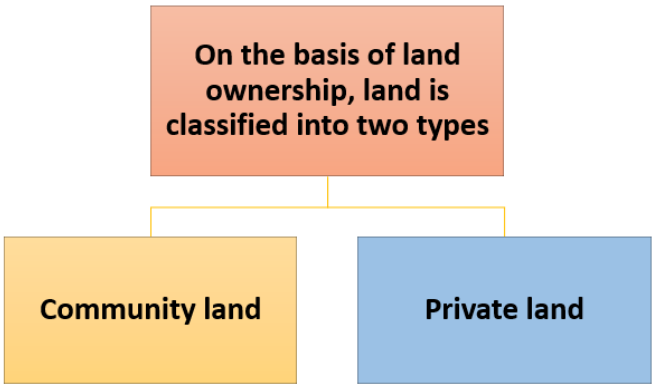
It is one of the most important natural resources that we need for our survival.

About 30 percent of the total area of the surface of our planet is occupied by the land.

River valley and plains are some of the most densely populated regions across the globe where agriculture is the most suitable occupation.

Land Use

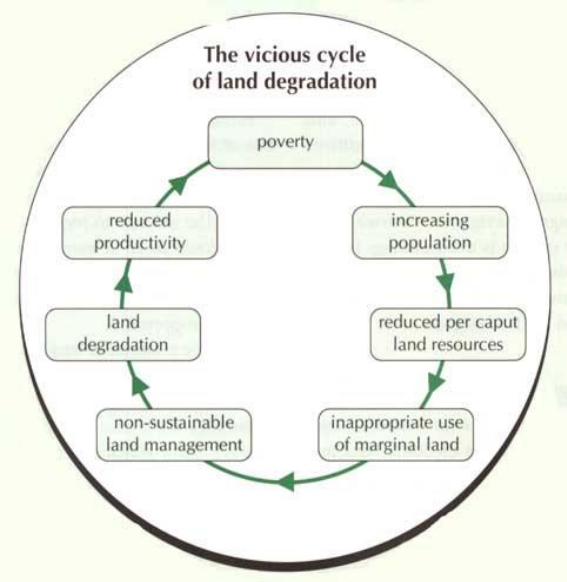
People depend on the land for different usages such as mining, building roads and houses, forestry, setting up factories, agriculture among others. This process is known as 'Land Use.'

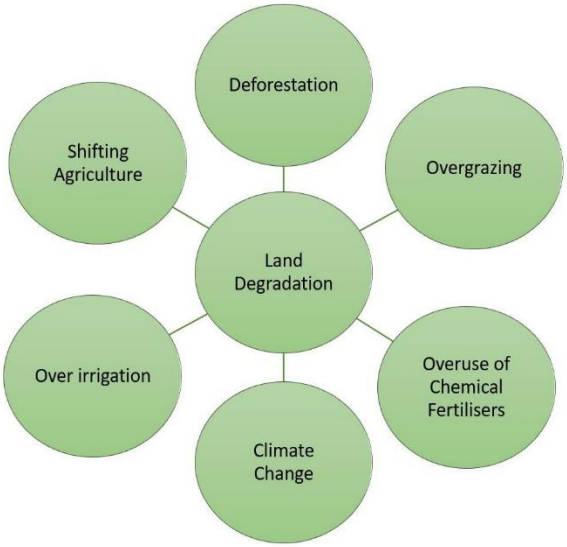


On the basis of land ownership, further the land is classified into two types:

1. Community Land: The whole community owns and maintains this type of land for common usages such as collection of medical herbs or nuts, fodder or fruits and vegetables. Another name for this type of land is Common Property Resources.
2. Private Land: Individuals own these types of land.

Land Degradation



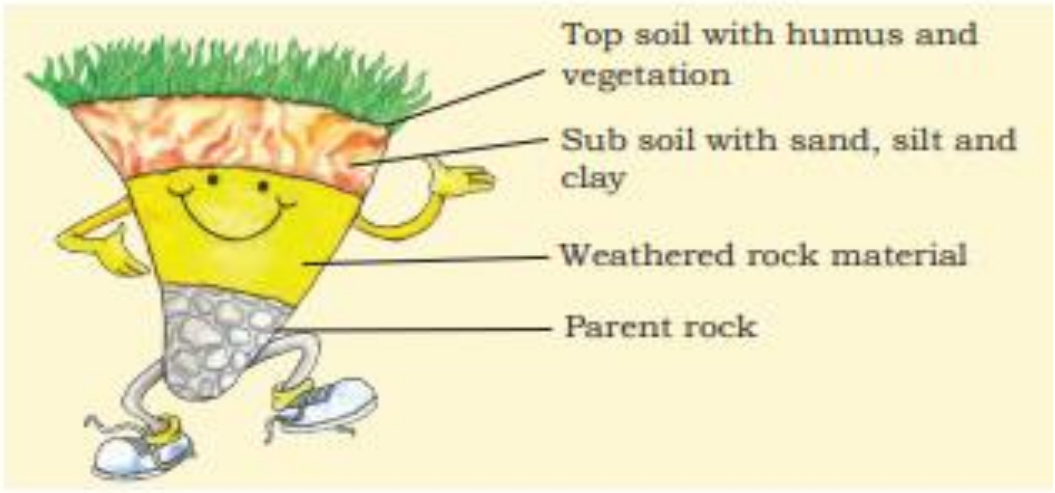


Conservation of Land Resource

As the population growth has sky-rocketed, the different demands of people have also increased. Due to this, the destruction of arable land and forest cover has started occurring on a large scale. This has also led to the fear of losing these natural resources. Therefore, the government needs to introduce laws in order to keep a check on the process of land degradation.

Regulated use of fertilizers and chemical pesticides, land reclamation, introducing measures to control overgrazing and afforestation are some of measures to conserve land resources.

Soil Profile



Factors of Soil Formation

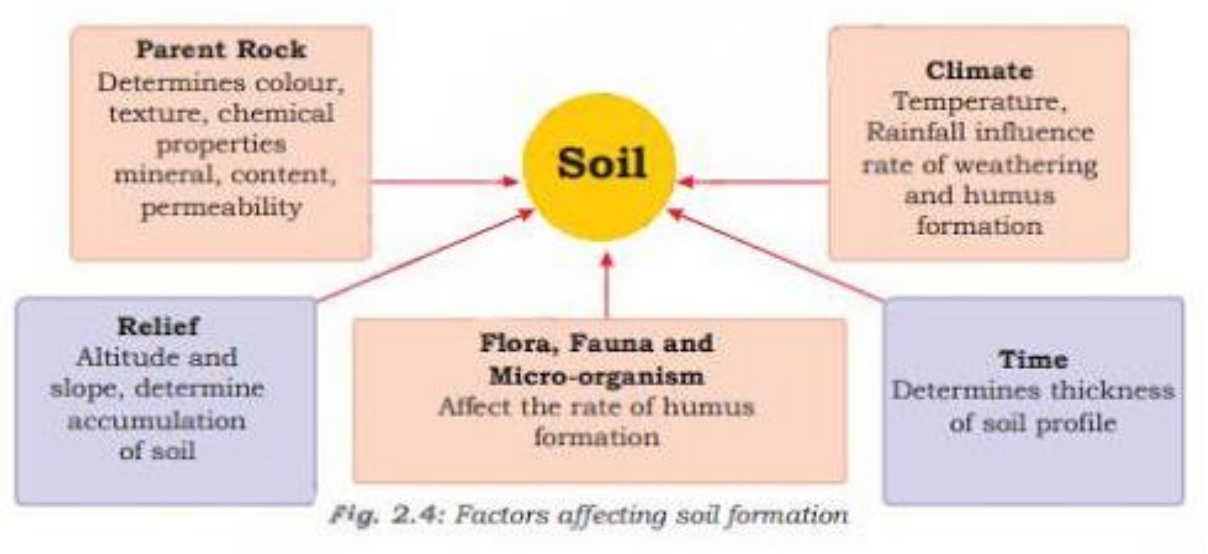


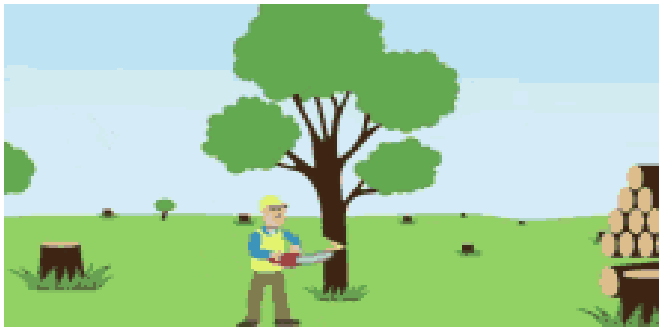
Fig. 2.4: Factors affecting soil formation

Those factors which affect the formation of soil are:

1. Parent Rock: It is responsible for determining chemical properties, permeability, color, mineral content and texture.
2. Flora, Fauna and Microorganism: It is responsible for affecting humus formation rate.
3. Time: It determines how thick the soil profile would be.
4. Relief: Slope and altitude are responsible for determining how the soil would get accumulated.
5. Climate: The climatic factors such as rainfall and temperature are responsible for influencing formation of humus and weathering rate.

Degradation of Soil and Measures of Conservation

Soil erosion and its depletion are few of the major reasons that pose a threat to soil in the form of a natural resource. Few of the factors which are responsible for soil erosion are rain wash, overgrazing, pesticides or chemical fertilizers overuse, floods and deforestation.



Few of the methods that can be used to conserve the soil are as follows:

1. Mulching: A type of organic matter layer such as straw is used to cover bare grounds present between plants. It is a useful way to retain the moisture of the soil.

2. Rock Dam: In order to slow down the flow of water, we can pile up rocks at a place. It is helpful in preventing gullies which further strengthens the soil of that place.

3. Contour Barriers: Soil, stones and grass can be utilized to build up barriers on the side of counters. In the front of barriers, trenches are constructed so that water could be collected.

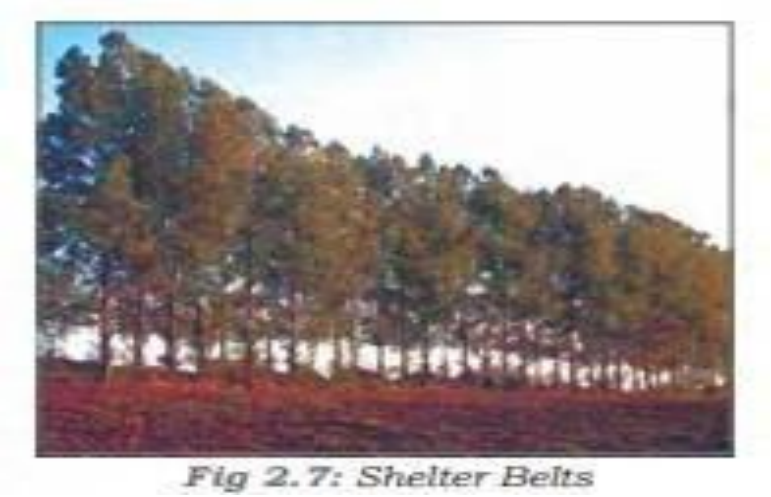
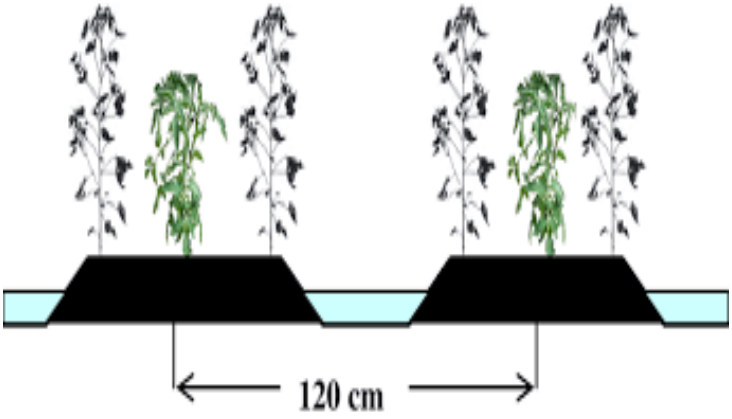


Fig 2.7: Shelter Belts

4. Shelter Belts: People residing in dry and coastal regions plant trees in rows so that wind movement could be checked and controlled in order to protect the soil cover.

5. Terrace farming: Terraces or Broad Flats are constructed on slopes that are steep in nature. In this way, people are able to grow different kinds of crops on flat surfaces. This prevents soil erosion as well as running off of surfaces.



6. Inter cropping: Alternate rows are constructed in order to grow different types of crops. To protect the soil from washing away, crops are sown in different seasons.

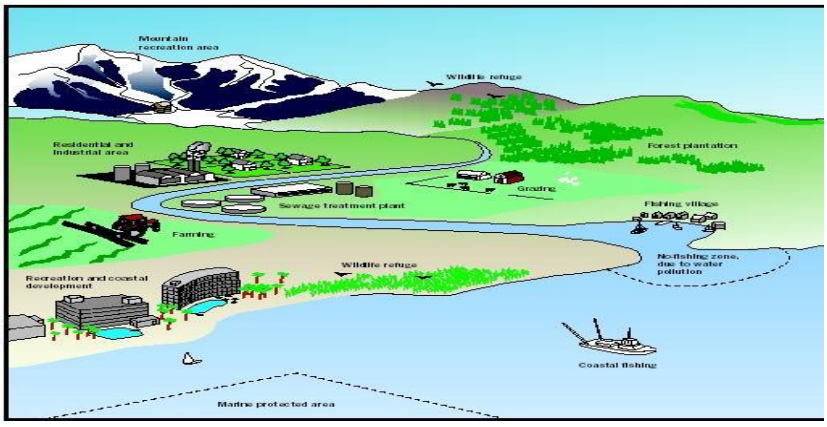
7. Contour Ploughing: Ploughing of different crops are carried out in parallel to the slopes of the hill. It becomes a natural barrier for water so that water does not flow down.

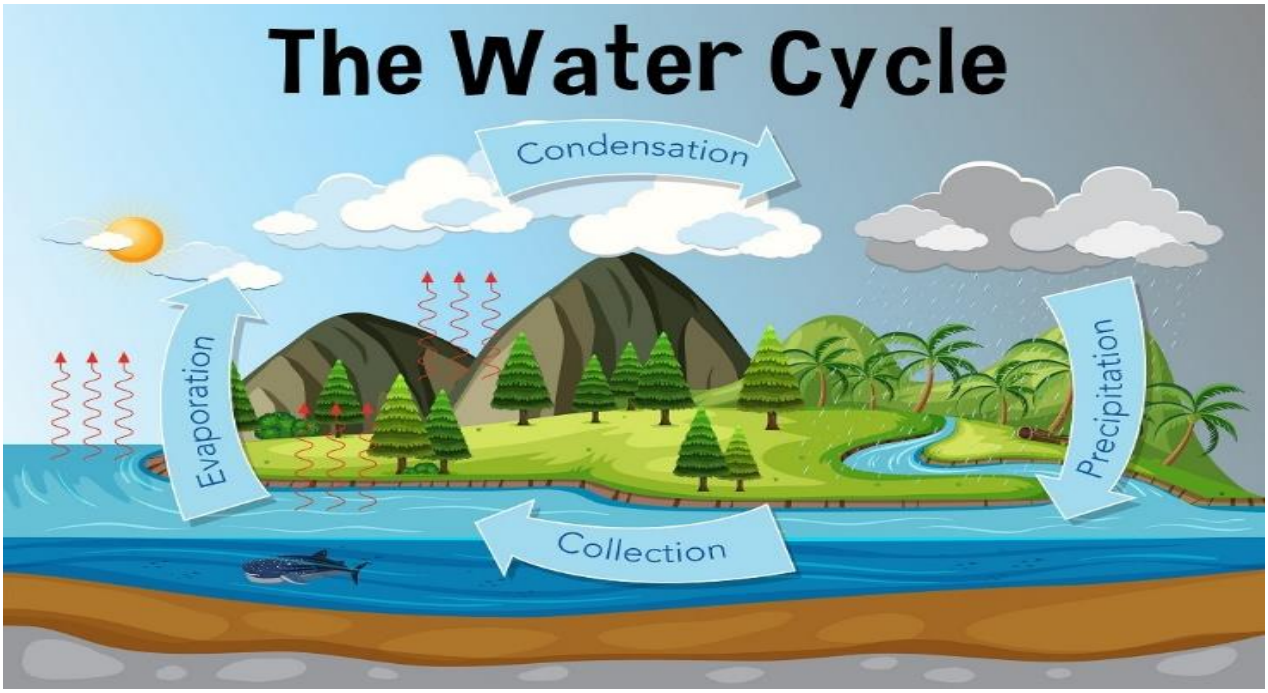
Water

It is a necessary renewable resource. Water covers almost three-fourth of the earth's surface. Hence, our planet is also addressed as a 'water planet.'

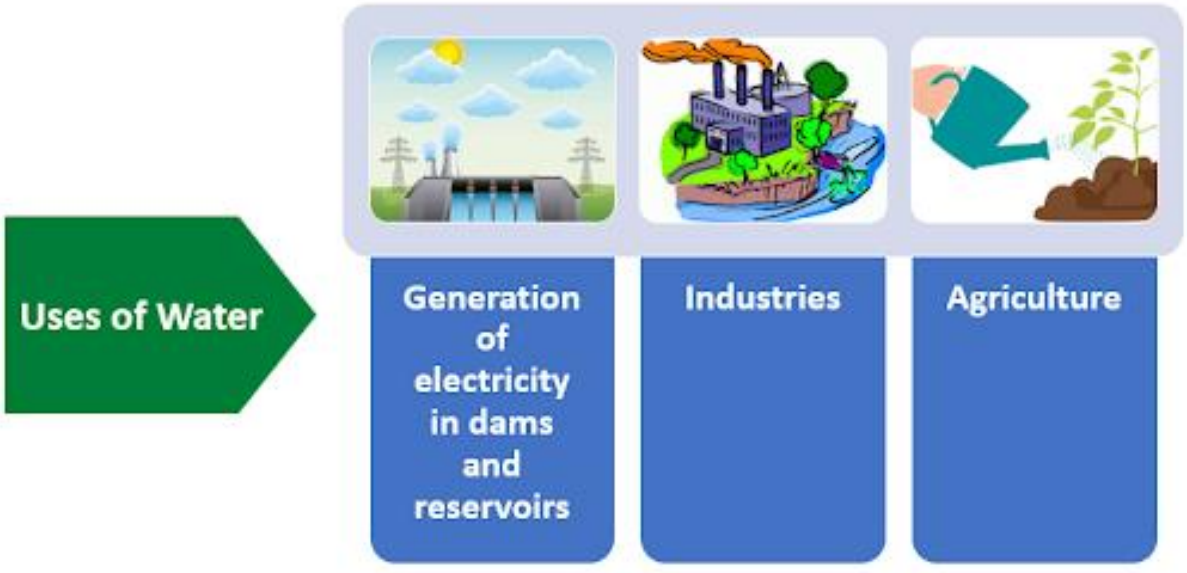
Around 3.5 billion years back, life began for the first time in the waters of the primitive oceans. Oceans occupy more than two thirds of the earth's surface.

Fresh water occupies more than 2.7 percent of the total available amount of water which is really low. Out of this, approximately 70 percent of water is available in the form of ice sheets and glaciers in Greenland, Antarctica and other mountainous regions. These sources are inaccessible due to their location. Due to this, humans can use only 1 percent of available fresh water.





The most precious substance on the surface of the earth is freshwater. Water's total volume will always be constant. As the water is in constant motion, it keeps cycling from one ocean to another, air, river, lakes and land via different processes such as run-off, precipitation and evaporation. The whole process is referred to as 'Water Cycle.'



Problems of Water Availability

Many places in the world are facing water shortages today. Majority of Asia, Australia, Africa, Mexico, western USA and various South American countries are facing this issue.

Those countries which are situated in climatic zones that face scarcity of water are majorly affected. Due to variations in annual or seasonal precipitation, water shortages are occurring at a rapid rate.

Countries located in climatic zones most susceptible to droughts face great problems of water scarcity. Apart from that water sources are being over-exploited and contaminated on a large scale as well.

Conservation of Water Resources