Land, soil and water are the three most important natural resources. The entire life system depends on them, directly or indirectly. All three resources are finite- that is, they are limited in supply. Therefore, we need to utilize these resources in the best possible way, ensuring maximum benefits with minimum wastage. If we overuse or misuse them, which humans have been doing for some time now, a time may soon come when life on Earth will become impossible.

Land: land is among the most important natural resources. It covers only about 30% of the total area of the earth's surface and all parts of this small percentage are not habitable. In fact, 90% of the world's population lives on 30% of the land area. The uneven distribution of population in different parts of the world is mainly due to varied characteristics of land and climate. The rugged topography, steep slopes of the mountains, low- lying areas susceptible to water logging, desert areas, and thick forested areas are normally sparsely populated or uninhabited. Plains and rivers valleys offer suitable land for agriculture.

Land use: land is used for different purposes such as agriculture, forestry, and mining, building houses, roads and setting up of industries. This is commonly termed as land use. The use of land in determined by physical factors such as topography soil, climate, minerals and availability of water. Human factors such as population and technology are also important determinants of land use pattern. **Classification of land:**

1. On the basis of relief: As plateau, plains and mountains,
2. On the basis of soil fertility: As fertile and barren land.
3. On the basis of development of that area: As rural and urban.
4. On the basis of the use we it: As arable land which is suitable for crop production , pasture land- for raring animals, forests, fallow- land which can be cultivated, but has been left unused for the season, cultivable waste- land which can be cultivated but which has been laying fallow for more than five years. And non- agricultural land.
5. On the basis of ownership: private land and community land. Private land is owned by individuals whereas, community land is owned by the community for common uses like collection of land are also called common property resources.

• Today the vast changes in the land use pattern also reflect the cultural changes in our society. Land degradation, landslides, soil erosion, desertification are the major threats to the environment because of the expansion of agriculture and construction activities.

• Net sow area is 46.6%, forested land is 22.6%, permanent pasture is 3.6%, cultivable wasteland is 4.5 %, land not available for cultivable (i.e., non-agricultural uses) is 13.5%. The number of people and these needs are ever growing, but the availability of land is limited as it is a finite resource. As pressure on land increases it usually leads to land degradation.

Land Degradation: Over-exploitation of land resources and concretization causes land desertification, which are major threats to the environment. **Land degradation** refers to the decline in productivity of cultivated land or forest land. Generally, land degradation results from unsuitable and unscientific land use. Therefore, the present rate of degradation of land must be checked. A forestation, land reclamation, regulated use of chemical pesticides and fertilizers

and checks on overgrazing are some of the common methods used to conserve land resources.

Conservation Of Land Resource: To ensure that the natural resources are not depleted and to maintain ecological balance, the present recourse of degradation of land resources must be checked. Afforestation, land reclamation, regulated use of chemicals pesticides and fertilizers, planting or shelter belts, controlled mining and checks or overgrazing are some of the common methods use to conserve land.

Soil: The thin layer of grainy substance covering the surface of the earth is called soil. It is closely linked to land. Landforms determine the type of soil. Soil is made up of organic matter, minerals and weathered rocks found on the earth. This happens through the process of weathering. The right mix of minerals and organic matter make the soil fertile. Factors of soil formation: the nature of the parent rock and climatic factors. Others factors are the topography, role of organic material and time taken for the composition of soil formation. All these differ from place to place.

- **Topsoil (A):** The layer is dark in color, has a fine texture, has a high content of organic matter (for humus), and is vital for plant growth.
- **Subsoil (B):** This is the layer just below the topsoil; it consists of sand, silt and clay, but has only minor amounts of organics matter.

- **Parent Material (C):** This horizon usually consists of unconsolidated rock material from which the A and B layers have been formed. This zone has no dose it have any soil structures.
- **Bedrock (R or D):** This layer lies at some depth below the C horizon and consists of solid rock.

Factors of Soil formation:

- Parent rock: determines colour, texture, chemical properties minerals, content, and permeability.
- Relief: altitude and slope, determine accumulation of soil.
- Flora, fauna and micro- organism: affect the rate of humus formation.
- Climate: temperature, rainfall influence rate of weathering and humus.
- Time: determines thickness of soil profile.

Degradation of soil and conservation measures: Soil erosion and depletion are the major threats to soil as resources. Both human and natural factors can lead to degradation of soils. Factors which lead to soil degradation are deforestation, overgrazing, overuse of chemical fertilizers of pesticides, rain wash, landslides and floods.

Soils of India: The Indian Council of Agricultural Research (ICAR) has classified the soils found in India into eight groups.

1. **Alluvial Soil:** This is a rich and fertile soil formed by the depositional action of rivers. Rivers transport eroded material on their higher reaches and deposit this material on their banks they reach the plains. This fertile alluvial soil supports cultivation of crops.
2. **Black Soil:** black soil is also known as regur soil or cotton soil. It is found in and around lava plateaus. This deep and clayey soil swells when it is wet and contracts when dry. Therefore it develops wide cracks during summer. It is ideal for the growth of cotton.

3. Red Soil: Red soil is sandy and red in colour. The redness is due to the presence of iron oxides. In the lowlands, they are normally fertile, but in the dry uplands, they are less fertile. It is suitable for growth of millets, cotton, wheat, onions and potatoes.

4. Laterite soil: laterite soil is formed due to intense leaching (i.e., when water washes over soil nutrients) in regions with heavy rainfall. This soil is not naturally fertile as a top soil along with the humus is washed away by heavy rainfall. To make this soil cultivatable, it has to be treated with fertilizers. It is used for growing jute millets fodder crop, etc.

5. Sandy soil: this soil is found in the dry regions. The colour of the soil varies from dark shades of reddish brown to. It has very low moisture and humus content as it is found in dry deserts. With efficient irrigation the soil can be made cultivatable.

6. Forest soil: it is found where there is dense vegetation, we can find peaty and forest soil. This soil is rich in humus as the organic matter is that decomposes to provide the same.

Methods of soil conservation are:

- Mulching: the bare ground between plans is covered with a layer of organic matter like straw. It helps to retain soil moisture.
- Contour barriers: stones, grass, soil are used to build barriers along contours. Trenches are made in front of the barriers to collect water.
- Rock dam: Rocks are piled up to slow down the flow of water. This prevents gullies and further soil loss.
- Terrace farming: broad flat steps or terraces are made on the steep slopes so that flat surfaces are available to grow crops. They reduce surface run- off and soil erosion.
- Intercropping: different crops are grown in alternate rows and are sown at different times of protect the soil from rain wash.
- Contour ploughing: ploughing parallel to the contours of a hill slope to form a natural barrier for water to flow down the slope.
- Shelter belts: in the coastal and dry regions, rows of trees are planted to check the wind movement to protect soil cover.

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