IMPORTANSE OF SOIL

Soil is our life support system. Soils provide anchorage for roots, hold water and nutrients. Soils are home to myriad micro-organisms that fix nitrogen and decompose organic matter, and armies of microscopic animals as well as earthworms and termites. We build on soil as well as with it and in it.

Soil plays a vital role in the Earth’s ecosystem. Without soil human life would be very difficult. Soil provides plants with foothold for their roots and holds the necessary nutrients for plants to grow; it filters the rainwater and regulates the discharge of excess rainwater, preventing flooding; it is capable of storing large amounts of organic carbon; it buffers against pollutants, thus protecting groundwater quality; it provides Man with some essential construction and manufacturing materials, we build our houses with bricks made from clay, we drink coffee from a cup that is essentially backed soil (clay); it also presents a record of past environmental conditions.

Soil functions are general capabilities of soils that are important for various agricultural, environmental, nature protection, landscape architecture and urban applications. Six key soil functions are:

1. Food and other biomass production

2. Environmental Interaction: storage, filtering, and transformation

3. Biological habitat and gene pool

4. Source of raw materials

5. Physical and cultural heritage

6. Platform for man-made structures: buildings, highways.

Healthy soils are essential for healthy plant growth, human nutrition, and water filtration. Healthy soil supports a landscape that is more resilient to the impacts of drought, flood, or fire. Soil helps to regulate the Earth’s climate and stores more carbon than all of the world’s forests combined. Healthy soils are fundamental to our survival.

Soil is important for the various functions it provides plants, trees, animals, and humans. Soil provides nutrients, support, protection, and filtration in its multi-functions.

1. Soil Provides Growing Medium for Plants and Trees

Soil supports all types of plant life in several ways. From water, nutrients and anchoring plants and trees, soil serves nature as its nurturer.

2. Root System Support

The soil affords roots systems support. The soil provides a way for the plant or tree to anchor itself upright and remain vertical.

3. Soil Provides Roots With Nutrients and Minerals

The soil also provides plant life of all forms the needed nutrients and minerals to grow, produce flowers, seeds, and in some cases fruits or vegetables. The type of soil determines the type and quantities of these vital and sustaining elements.

4. Exchange of Oxygen and Gases

Oxygen is trapped among the spaces between the particles in soil. This provides oxygen to plant and tree roots. The roots utilize the oxygen to breakdown various sugars from the rhizosphere (soil containing root excretions) and root microbiome (soil microorganisms). These are then provided to the plants and trees to spur growth.

5. Protection From Erosion

The soil provides plants and trees the protection needed against erosion and being swept away in heavy rainstorms. Soil gives root systems the needed support to keep plants and trees from being uprooted during severe windstorms and other types of weather.

6. Marine Soils Protect Coastlines

Marine soils nourish seagrasses and seaweeds that feed marine life and gives them places to shelter. Just as importantly, the seagrasses and seaweeds protect the coastlines from erosion.

7. Soil Filtering Properties

The soil is able to filter unwanted and harmful contaminants away from the roots of plants and trees. This natural filtering system is vital to the growth of plants and trees.

8. Soil Holds Water

The soil is able to hold water to provide continual moisture and vital nutrients to plant root systems. The level of water the soil can contain depends on the type of soil. When compared to sandy soil water retention, clay soil will hold water for a longer period of time.

9. Decomposition of Organic Materials

With the help of resident organisms and micro-organisms found in soil, the natural decomposition process of organic material is sped up. These microscopic workers turn the organic matter found in soil into a waste product of vital nutrients. This serves as a continual food source through the mineralization of decomposed organic materials for both the organisms and most importantly, plant life.

10. Soil Recycling Processes

The decomposing of organic materials and the holding of water are part of the soil's recycling processes. The soil transforms these used matters into useable nutrients and minerals to sustain and support the plants.

11. Soil's Importance to Humans

Humans are dependent on soil just as the rest of the animal and plant kingdoms. Soil provides humans with many necessary things.

12. Soil Provides Food

The ability to grow food depends on the soil, more specifically, the quality and type of soil. A nutrient rich soil like compost means plants can provide abundant healthy vegetables and fruits for humans to eat. The results of planting in poor soil is a poor harvest, with plants suffering from malnutrition, diseases and pest infestations.

13. Foundation for Construction

Soil provides a foundation for various human construction projects, such as homes and buildings. Soil also supports the construction of roads, railways and bridges.

14. Raw Materials

The raw materials provided by soil, such as nutrients, microbes and minerals are used by humans to grow foods, depending on the type and quality of the soil. Ancient pottery was made using different soils and sediments. Clay soils are still used to create modern pottery and ceramics. Adobe bricks have been used for centuries. Modern bricks are made from clay and fired in a kiln.

15. Animals Depend on Soil

Animals depend on the soil for food, directly or indirectly. Grazing animals rely on the soil to produce grasses, while burrowing animals rely on the soil to provide homes and protection. The quality of soil determines the animal diversity.

16. Insects, Annelids and Others Rely on Soil

The insect population also relies on soil for its survival. From pollinators to ants and other underground critters, such as annelids (earthworms), arachnids (spiders), diplopoda (millipedes), and chilopoda (centipedes), the soil determines the odds of their survival.

17. Soil and the Ecosystem

The soil plays a major role in the ecosystem. It could be called the glue that holds nature together.

18. Soil Modifies Temperatures for Roots

Root systems are insulated from changing temperatures by the soil. The density of the soil and air pockets in the soil particles can protect roots from heat and cold.

19. Soil Regulates Carbon Cycling

It's through the various processes taking place that the carbon cycle is held in balance. The soil processes store more carbon than the plants and trees. The soil processes determine how much carbon is stored and how much carbon is released.

20. Soil Natural Filtration System

When rainfall or surface soil contains harmful contaminants or pollutants that sift down into the soil, the soil serves as a filter. The various soil particles catch these contaminants and the water moves over them, unscathed and spared contamination, on its way to the groundwater, rivers and aquifers.

21. Soil and the Water Cycle

The soil particles prevent water from rushing through rocks. The sponge-like properties of the soil store water for plant and tree use as well as soil microbes and various soil inhabitants.