

SOIL – EARTH'S LIVING SKIN

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Introduction

Soil is a natural body of mineral, organic and nutrient constituents which result from the interaction of the country rock with environmental factors of climate, topography, plant and animal life. The term soil is derived from the Latin word solum, which means ground.

Soil is seen as a earth living skin because it contains living organism, both micro and macro organisms, and partly because it is continually being created from the underlying materials as the top part is being destroyed by agents of erosion. Hence soil can be born and can be killed by foolish actions of man.

Soil is different from the underlying material in its morphology, appearance, physical, chemical and mineralogical composition and in the way in which it supports and reacts to agent growth and functions within the biotic complex or the ecosystem.

This person who studies the soil in terms of its origin, properties and distribution is referred to as a pedologist.

Composition of Soil

Soil is made up of the following components which include organic matter, inorganic matter, soil water and the soil air.

Organic matter forms 5 percent of the total volume and is made up of plant and animal remains, this form humus as a result of decomposition of animal and plant remains. Where humus storing and supplying nutrients to plant, it regulates the temperature of the soil and improves the structure of the soil and its water retention capacity.

Inorganic matter forms 45 percent of the total volume and is made of minerals from the parent rock.

Soil water makes 25 percent of the total volume of soil. It is derived essentially from rainfall especially from infiltration and through flow. Importance of water to soil, first it regulates the temperature in the soil, it transfers nutrients in the soil, it controls chemical processes like chemical and mechanical weathering.

Soil Air forms 25% of the total volume. It constitutes the soil atmosphere from which plants and soil organisms obtain oxygen for their metabolism and dispose of carbon dioxide and other noxious gases. The diffusion of air in the soil is through the micropores, cracks, fissures and animal burrows.

Soil Properties

Soil properties include soil profile, depth and colour.

Soil profile is the vertical section from the surface to the parent rock characterized by distinct layers k (Horizon), usually of different textures and colours. Soil profile varies from place to place depending on the variation in environmental conditions.

Soil depth varies from place to place depending on maturity which is in turn influenced by the nature of the rock. Example some places have deep soil due to soft parent rock, long duration of soil formation and deposition in the low land areas. Soil depth is important for agricultural activities. Deep soil is good for cultivation while shallow soil is not good for cultivation.

Soil colour is determined by the mineralogical composition from which the soil is derived and organic matter content. It varies from one place to another. It can

be used for classification and description of the soil. The colour terms are mostly dark, bright and light.

Soil texture this refers to the degree of coarseness or fineness of the soil materials especially soil mineral particles. Soil texture can be measured by finger testing which involves rubbing the soil between fingers. Also a series of sieves with varying meshes is used for separating the mineral particles according to size.

Soil structure is the arrangement of soil particles into aggregate compound particles. The structure of soil is influenced by organic matter content, which increases granulation and stability of aggregates, climate through weathering and climatic changes at large. Structure of the soil can be platy, prismatic, granular, crumbly, columnar and Blocky.

Soil temperature has certain degree of temperature and this tends to vary from place to place due to variation in the climatic conditions. Importance of temperature in the soil is, it controls the plant growth, it also determines the existence of micro – organism in certain areas, it also control the amount of moisture in the soil.

Soil formation is principally caused by weathering of the parent rock. Variables of soil formation are divided into active factors like climate and organisms since they produce their own energy during the soil formation and the passive factors like topography, parent rock, time, wind and temperature.

Processes of soil formation has two stages which are weathering and the second stage involve the formation of the true soil, which results from addition of water, gases, living organisms and the decayed organic matter. Hence weathering involves the disintegration and decomposition of the rocks and minerals.

Soil Classification

Soil classification is the grouping of soils into classes according to their general characteristics. Soil can be classified into two levels. First is at a local level based on the dominant soil formation factors like parent rock, climate, vegetation, slope and drainage. Second is at a global level which is the classification based on factors like climate, water and vegetation. Their interplay produces varying soil regimes. Soil can be classified according to climatic variation, morphological properties like depth and colour, genesis, suitability to agriculture activities, drainage of the soil.

Soil can be classified in various ways: first empirical classification system which classified according to their properties and textures. Second is morphological classification system which classified according to shallow, deep of the soil. Third is genetic classification system which is based on the formation factors and processes. Fourth is integrated classification system which combines all the aspects of other systems.

Zonal order soil is soil which has undergone long time of soil formation processes under good drainage conditions for example in topical areas, temperature areas and cold areas. A zonal order soils are young soils which have not undergone full soil formation processes. Soil catena is the arrangement of soil on a slope from top to bottom.

Soil types are llatosols found in area with high rainfall and temperature, nitosols which are deep, porous friable soil which are fertile. **Chernorems** which are dark colored soil with relatively high organic content and calcium. Sierozems are desert soils, formed where there is little rainfall and high temperature, Podzols are soils found in the higher latitudes and forested areas.

Soil Fertility

Soil fertility refers to the ability of the soil to support plant growth. Fertility depends on presences of mineral plant nutrients, presence of water, air, degree of alkalinity or acidity, presence of soil colloids, soil organism and other factors are texture, temperature, structure, porosity, permeability and relief.

Soil degradation is the deterioration of the quality of the soil through the loss of fertility, pollution, erosion and mass wasting.

Loss of fertility can be caused by mass wasting, pollution erosion, monoculture, over cultivation and severe loss of soil water.

Soil erosion is the wearing away of soil material from one place to another through agents like water, wind and ice. There are two types of soil erosion which are normal geological erosion which occurs when ever there is natural flow of energy and matter on the earth surface without man's influences and the second is accelerated soil erosion associated with man's activities. Factors affecting accelerated soil erosion are climate, topography, nature of soil, vegetation cover, poor management and increase in population. Human activities which cause erosion are poor cultivation methods, mining activities, and construction activities, overgrazing, cutting trees and burning of vegetation.

Effects of soil erosion are pollution of water bodies, loss of fertility of the soil, deforestation, size of arable land reduced, transport system destroyed, and houses destroyed. It can also cause emigration from ended areas.

Soil pollution refers to the presence of any substance in the soil which affect soil quality. Its sources can be acidic rain, chemicals from industries, metal material, bottles, plastic bags, crop remains and fertilizers.

Effects of soil pollution are decline in fertility of the soil, destruction of soil structure and texture, death of soil organism, crop failure.

Recommendations for Soil Management and Conservation

Soil can be conserved by, educating the people so as to promote the land management, planting of cover crops, reforestation and a-forestation in order to check soil erosion. Alternative source of energy should be explored and used to control the excessive use of forest materials especially in developing countries, developing other economic activities rather than depending on agriculture only. Radioactive materials should be dumped very deep in the soil to prevent the upper soil layer from being highly affected.

The following are the importance of soil as the living skin of the earth: first it enables agricultural activities by providing the fertility to plants and influence the plant growth. Second it is the source of some minerals found in it. Third it is the place where ground water is found which is useful in our daily life. Fourth soil is the place where the micro and macro organism can live and survive. Fifth importance of soil provides the nutrients to plants from the decomposition of animal and plant remains. Sixth importance of soil can regulate the temperature of the place. Seventh importance of soil, the place where the vegetation grows, eighth importance of soil is that it can used to make some properties like cup, bottles. Nineth importance of soil is that it protects the inner part of the earth as the skin of the earth from the external dangers.

CONCLUSION

Soil is the upper layer of the earth crust where most of the human economic activities are done. As skin covers most part of the human body, the soil also covers almost the whole top layer of the earth's crust.

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Motivation statement:

The reason why I chose this topic is that, I want to show how much soil is important for human development, human life and life of other living organisms. Also is to make people aware that the utilization and sustainable use of soil resources is our right and our responsibility and so is of paramount importance for sustainable living on our planet earth.

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