In order to fully comprehend soil formation, one must understand what soil is. The definition of soil has been altered and debated by pedologists since at least the early 20th century, when it was described as "a medium for plant growth." Prior to that time, pedologists have studied different aspects of the soil, each bringing their own knowledge and experiences to the discipline.

The definition of soil has since evolved to include all facets of soil, in an approach to find the proper holistic description. Soil can now be described as a dynamic natural body composed of mineral and organic solids, gases, and liquids, as well as living organisms. It is often stated that the soil-forming factors set the conditions for internal soil-forming processes.This means that the five soil formation factors (climate, parent material, relief, vegetation and biota) directly influence the soils' processes of addition, losses, translocation and transformation.

Soil climate is perhaps the most emphasized, and complex soil-forming factor. Its interaction with vegetation and water contribute to the soil's formation and can be subdivided into two climatic groups, Pedalfers and Pedocals. Pedalfers were based on leaching soil water and pedocals on non-leaching. Pedoclimate can also be used to differentiate between soils on a global scale. Different types of vegetation can only grow in certain climates, thus altering what type of roots are prevalent and how they interact with a given soil type. The same can be said about microorganisms, since particular ones can only be found in certain climatic zones.

It soon became apparent that while climate is an important factor at a continental scale, changes in local soil variability could be better attributed to changes in relief.Relief is the

relative differences in elevation between the upland summits and the lowland valleys of a given region.

The relief of a given area may accelerate or impede the work of climatic forces. On steep slopes soil destruction occurs more rapidly than soil formation because steep slopes are more prone to erosion and do not allow as much, if any, rainfall to enter the soil before running off. In dry regions the lack of rain penetrating the soil results in less vegetation on steep slopes. Soils in this type of relief have shallow and poorly developed profiles compared to soils on flatter terrain. Relief is an important factor in the vertical zonation and drainage sequence of soils. Soil types can be differentiated according to: mega-, macro-, meso-, micro-, and nanostructures. Mega relates to mountains, plains, and lowlands. Macrostructures relate to bioclimatic zones, microstructures relate to micro-relief, while nano-structures are the elementary soil areals.Relief alters the soil because certain vegetation grows in a particular area (trees may grow where there is a slight depression), may interfere with salt buildup, and may create ridges where parent material interact due to tilted beds.

Parent material is the unconsolidated weathered mineral or organic matter from which the A and B horizons in the soils are developed in a geomorphic process. It is a key soil-forming factor, particularly at the regional scale and is the geological or organic precursor to the soil. Much like the other factors of soil formation, the parent material will strongly influence what will eventually become the native biota of the given soil.

When relief interacts with vegetation it will often influence the type of soil formed. For instance the soil in low lands or depressions tends to be wetter than soil in higher lands. These

low lands give rise to increased diversity and quantity of vegetation. Lowlands may also give rise to peat bogs and later organic soils.

Vegetation that covers the soil reduces soil erosion, which slows the rate of mineral surface removal. In comparing soils formed in grassland versus forest vegetation one can see that the grassland soils have a thicker A horizon with a deeper distribution of organic matter. This is because much of the organic matter added to the soil comes from the deep fibrous grass root systems. Grasslands also have frequent fires that decimate vegetation above ground and surface litter. Forest soils contain a thick O horizon and a thin A horizon. In forests the primary source of organic matter are leaves that fall from the trees. The increased acidity in many forest soils prevents certain soil organisms from mixing surface litter into the mineral soil. In grasslands the microbial community consists mainly of bacteria while in forests it is fungi. Their action affects the aggregation of mineral particles into stable granules and the rate of nutrient cycling.

Animals that dig burrows allow air and water to get to the lower soil horizons quicker than tree root systems. They enhance the mixing of horizons through digging and later refilling burrows. Earthworms that eat soil particles and organic residues increase the availability of plant nutrients in the material that passes through their bodies. Their movements through the soil also increase the stability of aggregates, allowing ready infiltration of water.

Once all of the parent material has been established, and the biota of the region have had an opportunity to begin their metabolic process, additions, losses, translocations, and transformations occur in the soil.

Additions are inputs of materials into developing soils from outside sources. Though some of soil formation is contributed to by losses; formation will not begin until plants are established and are providing additions. Additions can include fallen plant matter, dead animal matter,dust particles blown from somewhere else and landing on the soil, and the addition of salts or silica dissolved in the groundwater and deposited near or at the soil surface through evaporation.

Losses are the cumulative subtraction of matter through several processes. They include but are not limited to: leaching by rainwater of soluble materials, harvesting of crops by man or grazing by animals, fires (both manmade and natural), conversion of organic molecules to gasses by various soil biota, as well as peat bog harvest, where the soil is removed in its entirety.

When a material within a soil column is neither created nor destroyed, nor altered in its structure, it is considered to be a translocation. A translocation occurs through mainly the action of soil biota and water. It can also occur in agriculture when a field is tilled, changing the soil's natural stratification.

Soil constituents are in a state of constant change. When they remain in place but due to either biological, chemical, or physical processes change form, it is known as transformation. Rocks are broken down into minerals.Minerals are broken down into secondary minerals. Secondary minerals are converted by biota to energy and co-products. And water-soluble materials chemically change form.

The process of soil formation brings together and is brought together by the biological, chemical, physical, and ecological factors of a given environment. The process of soil formation imply that soil has an age, and that the older it becomes, the more developed it will typically be in terms of soil profile, and soil structure.

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