**Definition**

**Soil** - Soil is a complex natural body comprised of solids (minerals and organic matter), liquid, and gases that occurs on the land surface, occupies space, and is characterized by one or both of the following: horizons, or layers, that are distinguishable from the initial material as a result of additions, losses, transfers, and transformations of energy and matter or the ability to support rooted plants in a natural environment.

**Soil Complex – Components and Properties**

As learned from the definition, the soil is not simply one thing but made up of several components which all together make soil complex. The soil is in fact a three-phase system of solid, liquid and gaseous components, each of which has its own physical and chemical properties, in an equilibrium, or transient-state, relationship with the others. In addition to these components, each soil has a distinctive flora and fauna of bacteria, fungi, algae, blue-green algae, protozoa, arthropods etc. These soil organisms make the biotic component of the soil. The liquid and gaseous phases are, in small volumes, fairly homogenous, whereas the solid phase is heterogeneous, consisting of a range of different sized inorganic particles of silica, silicate clay, metal oxides, and other minor components. These are all present in varying degrees of association with different types of organic matter.

The various components of the soil complex are (i) mineral matter, (ii) soil air (iii) soil water (iv) soil solution (v) soil organic matter or humus

1. Mineral Matter

As a result of varying degree of weathering of parent material-rock, the mineral particles of different sizes are formed. In a given sample of soil, there may be present, different-sized particles in different proportions. Depending upon their size (diameter basis), the International Society of Soil Science has given different names to these mineral particles, which are as follows:

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| Name of the particle | Diameter range (mm) |
| Clay | Less than 0.002 |
| Silt | 0.002-0.02 |
| Fine Sand  | 0.02-0.20 |
| Coarse Sand | 0.20-2.0 |
| Stones and Gravel | Above 2.0 |

**Soil Texture**

Soil texture refers to the relative percentage of sand, silt and clay in a soil. Natural soils are comprised of soil particles of varying sizes. Texture is an important soil characteristic because it will partly determine water intake rates (absorption), water storage in the soil, and the ease of tillage operation, aeration status etc. and combinedly influence soil fertility.

As for an example, a coarse sandy soil is easy to cultivate or till, has enough aeration for good root growth and is easily wetted, but it also dries rapidly and easily loses plant nutrients through leaching. Whereas in case of high-clay soils (> 35% clay) have very small particles that fit tightly together, leaving very little pore spaces which permits very little room for water to flow into the soil. This condition makes soils difficult to wet, drain and till.

**Classes of Soil Texture:**

Texture names are given to soils based upon the relative proportion of each of the three soil minerals particles sand, silt and clay. Soil that are preponderantly clay, are called clay (textural class), those with high silt content are silt (textural class) those with high sand percentage are sand (textural class). They can be further classified on the basis of varying proportion of the minerals.

Textural group on the basis of varying percentages of sand, silt and clay mineral particles

|  |  |  |  |
| --- | --- | --- | --- |
| Textural Group | Sand | Silt | Clay |
|  |  |  |  |
|  |  |  |  |

Diagram to show classification of soil texture i.e. different textural groups of soil.

