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Soils in India

Soil is the significant natural resources, like air and water. It is the topmost layer of the earth's crust and is a mixture of finely powdered rocks, organic matter, liquids, myriad organisms and other minerals. It acts as an interface between hydrosphere, lithosphere, earth's atmosphere and biosphere

Soil can be simply defined as a mixture of small rock particles/debris and organic materials/ humus which develop on the earth surface and support growth of plants

The major types of soils found in India are

- Alluvial soil [43%]
- Red soil [18.5%]
- Black / regur soil [15%]
- Arid / desert soil
- Laterite soil
- Saline soil
- Peaty / marshy soil
- Forest soil
- Sub-mountain soil
- Snowfields

Alluvial soils

Alluvial soils are formed by the deposits of the sediments brought by rivers. Most of the rivers originate from the Himalayas and bring along a high amount of sediments with them. Mostly available soil in India (about 43%) which covers an area of 143 sq.km The soil is made up of particles like silt, sand and clay.

In peninsular-India, they are mostly found in deltas and estuaries, New alluvium is termed as Khadar and old alluvium is termed as Bhangar, These soils are mainly derived from the debris brought down from the Himalayas, they are rich in potash but poor in phosphorus, In the Alluvial soils the intensely cultivated crops are wheat,

maize, sugarcane, pulses, oilseed, They occur all along the Indo-Gangetic-Brahmaputra plains except in few places where the top layer is covered by desert sand. They also occur in deltas of the Mahanadi, the Godavari, the Krishna and the Cauvery, where they are called deltaic alluvium (coastal alluvium)

Desert Soil

The desert soil is found in regions with low rainfall in an arid and semi-arid climate. The sand in the desert areas is partly original and partly blown from Indus Valley. The soil content has 90-95% of sand and 5-10% of clay.

The phosphate content in the soil is high, while the nitrogen content is low. Desert soil lacks humus and moisture, and the water content in this soil is fulfilled through irrigation only, Kankar or Impure Calcium carbonate content is high which restricts the infiltration of water. Nitrogen is insufficient and Phosphate is normal.

These soils are saline in nature and in certain regions the salt content is so high that common salt is obtained by evaporating water. Due to increased calcium content in the lower horizons of the soil, there is the formation of 'kankar' layers. These kankar layers restrict the penetration of water and as such when water is made available through irrigation, the soil moisture is readily available for sustainable plant growth.

Laterite Soil

The name has been derived from the Latin word "later" which means brick. It accounts for about 3.7% of the total area of the country. These are typical soils of the monsoon climate which is characterised by seasonal rainfall. With rain, lime and silica are leached away, and soil rich in iron oxide and aluminium are left leading to the formation of laterite soil. Laterite soil is found in those regions of the country which receive heavy rainfall with an alternate dry and wet period - mainly, near the coasts.

This kind of soil becomes soft when wet and hardens when dry. In these climatic conditions, leaching of soil takes place, which is a process in which fertile portion of the soil gets washed away by heavy rains.

They are formed from the decomposition of rocks and contain iron oxide, which gives them red or pink colour. This type of soil is ordinarily deficient in nitrogen and is weak in lime content; it is acidic soil.

It is found in several parts of the country mainly Western and Eastern Ghats, Vindhyas, Malwa plateau and Satpuras, Rice, Ragi, Sugarcane and Cashew nuts are cultivated mainly. Laterite soils are found in Karnataka, Tamil Nadu, Kerala, Madhya Pradesh and hilly regions of Assam and Odisha.

Mountain Soil

Mountain soils are formed due to the accumulation of organic matter which is derived from the forest growth and is generally shallow in-depth and immature. This type of soil is rich in humus but has poor lime, potash and phosphorus content,

It is mainly found in the Himalayan region, Sikkim, Arunachal Pradesh, Assam, and also in Peninsular India, and the Eastern Ghats, The texture of the soil depends on the mountain environment where they are found. These soils are coarse-grained in the upper slopes and loamy and silty on valley sides. They are also called as Forest Soil

Black Soil

Black soil is also known as 'regur' which is derived from a Telugu word 'reguda'. Black soil is also known as Black Cotton Soil as cotton is an important crop which is grown in this type of soil. This type of soil is made up of volcanic rocks and lava.

This soil is rich in calcium carbonate, potash, lime and magnesium carbonate but has poor phosphorus content. It is mostly found in areas such as Gujarat, Madhya Pradesh and Maharashtra. It is also found in states like Tamil Nadu, Andhra Pradesh and Karnataka, Self-ploughing is a characteristic of the black soil as it develops wide cracks when dried, Black soil is also known as "Regur Soil" or the "Black Cotton Soil"

The black soils are generally clayey, deep and impermeable. They swell greatly and become sticky when wet in the rainy season.

In the dry season, the moisture evaporates, the soil shrinks and develops wide cracks. Black soils are rich in iron, lime, aluminium, magnesium and also contain potassium. However, these soils are deficient in nitrogen, phosphorus and organic matter. The mainly cultivated crops are Cotton, pulses, millets, castor, tobacco, sugarcane, citrus fruits, linseed

Peat Soil

These types of soils constitute about 10 to 40% of the organic matter and also a reasonable amount of soluble salts. Peaty soils are heavy, black and have high acidic content. They are low in phosphate and potash content.

The accumulation of a high amount of organic matters in the soil in humid regions results in the formation of peaty soils, they are found in regions of heavy rainfall and high humidity, and it supports the good growth of vegetation.

These soils are found in southern Uttarakhand, the northern part of Bihar, and the coastal areas of West Bengal, Odisha and Tamil Nadu

Saline & Alkaline Soil

These soils have high percentages of sodium, magnesium and potassium, and hence are infertile. The high salt content is mainly because of the dry climate and poor drainage. The texture ranges from sandy to loamy.

These soils are found in arid and semi-arid areas, and in waterlogged and swampy regions. These soils are deficient in calcium and nitrogen

Due to weathering, they release certain minerals such as magnesium, sodium, sulphurous acid and calcium salts. Some of the released species get carried by rivers and mix in sub-soils of the plains making the soils saline and alkaline,

There are many mineral-based and un-decomposed contents inside the earth. These are also called Reh, Usar, Kallar, Rakar, Thur, and Chopan. These are mainly found in Rajasthan, Haryana, Punjab, Uttar Pradesh, Bihar, and Maharashtra. Sodium chloride and sodium sulphate are present in this soil. It is suitable for leguminous crops.

Red Soil

The Red soil is formed as a result of weathering of metamorphic and igneous rocks. It is found in regions of low rainfall (eastern and southern parts of the Deccan Plateau). Along the piedmont zone of the Western Ghats, a long stretch of area is occupied by red loamy soil. This soil is also present in parts of Odisha and Chhattisgarh and in the southern parts of the Middle Ganga Plain

The red colour of the soil comes from the high percentage of iron content. The soil's texture varies from being sandy to clayey, but it is mainly loamy. It is rich in potash content but lacks phosphate, humus and nitrogen content, It is also known as Omnibus group, Wheat, cotton, pulses, tobacco, oilseeds, potato are mainly cultivated

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