

Soils in India – Distribution and Characteristics

Soil types



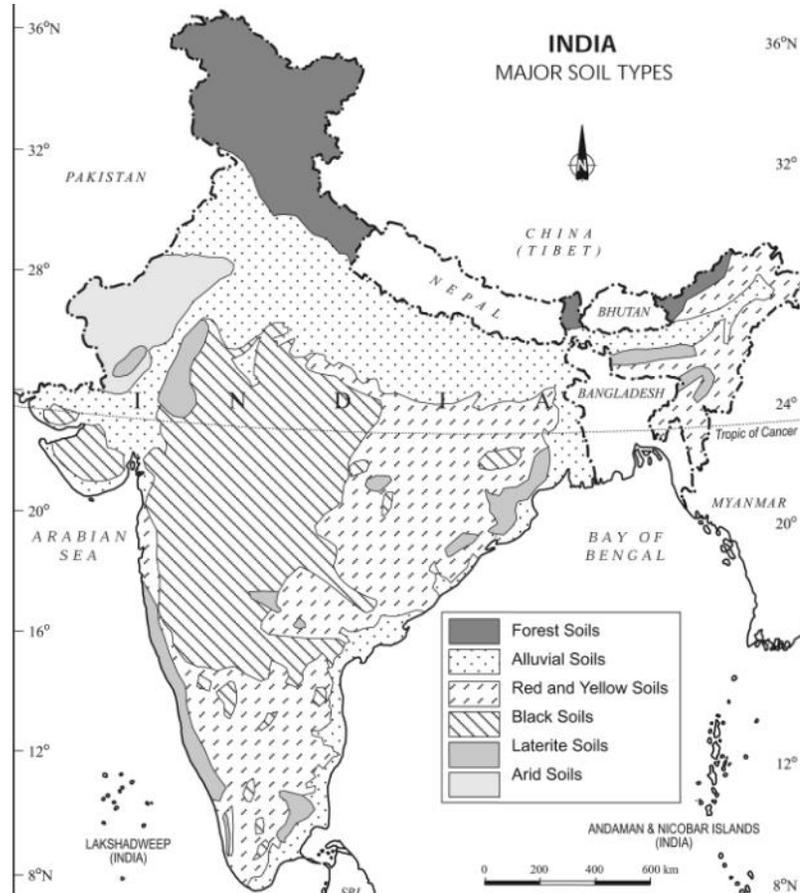
- Based on color
 - Red
 - Yellow
 - Black

Soils in India

1. Alluvial soils
2. Black soils
3. Red soils
4. Laterite and Lateritic soils
5. Forest and Mountain soils
6. Arid and Desert soils
7. Saline and Alkaline soils
8. Peaty and Marshy soils.



Distribution



Black soil (16.6%) > Red Soil (10%) > Laterite(8.5%) > Forest Soil (8.5%) > Alluvial (6%)> Arid (4.3%)

Dry deciduous - Black

Moist deciduous - Red and Yellow

Moist Ever green - Laterite

Characteristics

		Chars -N P K Iron Aluminium Magnesium Lime Humus	Suitable Crops
Alluvial Soils	<p>Formation: Alluvial deposits by rivers</p> <p>Extent: 6% of total area feeding 40% of population</p> <p>Distribution: Indo-Gangetic-Brahmaputra plains, Narmada, Tapi valleys and Northern parts of Gujarat, deltas of the Mahanadi, the Godavari, the Krishna and the Cauvery (coastal alluvium)</p>	<ul style="list-style-type: none"> immature and have weak profiles due to their recent origin Most of soil is sandy and clayey implies porous Nitrogen low; Phosphoric acid, Potash, alkaline adequate; Iron oxide and lime vary Bhabar, Terai, Bhangar, Khadar 	<ul style="list-style-type: none"> Best suited for agriculture and respond well to irrigation rice, wheat, sugarcane, tobacco, cotton, jute, maize, oilseeds, vegetables and fruits.
Black Soils	<p>Formation: High temperature and low rainfall, Black due to small proportion of titaniferous magnetite or iron & black constituents of the parent rock.</p> <p>Extent: 16.6 % of total area</p> <p>Distribution: Maharashtra, MP, parts of Karnataka, Telangana, AP, Gujarat, TN</p>	<ul style="list-style-type: none"> highly argillaceous with a large clay factor, 62 % or more. highly retentive of moisture, swells greatly on accumulating moisture, broad and deep cracks in summer, cracks permits oxygenation of the soil to sufficient depths and the soil has extraordinary fertility. Self ploughing soil Aluminum - 10%, Iron oxide- 10%, Lime and Magnesium Carbonates - 6-8%, Potash variable, phosphates, nitrogen and humus are low 	<ul style="list-style-type: none"> best suited for cotton crop wheat, jowar, linseed, Virginia tobacco, castor, sunflower and millets, vegetables and fruits Rice and Sugar cane where irrigation facilities are available
Red soils	<p>Formation: During rainy season, rainfall washes the upper soil and leaches materials to deep and during summers, through capillary action</p>	<ul style="list-style-type: none"> Texture - sandy to clay , majority loamy Uplands red soil - poor, gravelly, 	<p>Red soils, with the proper use of fertilizers and irrigation techniques, give</p>

	<p>iron and aluminium oxides are transported to the surface making the soil red</p> <p>Extent: 10%</p> <p>Distribution: parts of Karnataka, south-east of Maharashtra, Telangana, AP, MP, Chhattisgarh, Odisha, Chota Nagpur plateau; parts of south Bihar, West Bengal, Uttar Pradesh; Aravalis and the eastern half of Rajasthan (Mewar or Marwar Plateau), parts of North-Eastern states.</p>	<p>and porous</p> <ul style="list-style-type: none"> • Lowlands red soil - rich, deep dark and fertile • acidic mainly due to the nature of the parent rocks • poor in lime, magnesia, phosphates, nitrogen and humus • Fairly rich in potash and potassium 	<p>good yield of cotton, wheat, rice, pulses, millets, tobacco, oil seeds, potatoes and fruits.</p>
Laterite soils/Brick soil	<p>Formation- high temperature and heavy rainfall with alternate wet and dry period causes lime and silica leached away and a soil rich in oxides of iron and aluminium compounds is left behind which during summer hardened</p> <p>Extent: 8.5%</p> <p>Distribution-summits of Western Ghats , Eastern Ghats, the Rajmahal Hills, Vindhyan, Satpuras and Malwa Plateau.</p>	<ul style="list-style-type: none"> • Laterite soils are red in colour due to little clay and more gravel of red sand-stones • Rich in bauxite or ferric oxides. • Poor in lime, magnesia, potash and nitrogen • Sometimes, the phosphate content may be high in the form of iron phosphate. 	<ul style="list-style-type: none"> • lack fertility due to intensive leaching • Some laterites are suitable for growing plantation crops like tea, coffee, rubber, cinchona, coconut, arecanut
Forest-Mountain Soil	<p>Formation: characteristic deposition of organic matter derived from forests and their character changes with parent rocks, ground-configuration and climate.</p> <p>Extent: 8.5 %</p>	<ul style="list-style-type: none"> • rich in humus • deficient in potash, phosphorus and lime 	<ul style="list-style-type: none"> • Suitable for plantations of tea, coffee, spices and tropical fruits in peninsular forest region • Wheat, maize, barley and temperate fruits are grown in the Himalayan

	Distributions: Himalayan region- Valleys, north facing slopes, Western Ghats and eastern Ghats		forest region.
Arid- Desert soils	Extent: 4.3% Distribution: arid and semi-arid regions of Rajasthan, Punjab and Haryana, Sandy soils without clay factor are also common in coastal regions of Odisha, Tamil Nadu and Kerala.	<ul style="list-style-type: none"> • Desert soils consist of Aeolian sand (90 to 95 per cent) and clay (5 to 10 per cent). • presence of sand inhibits soil growth • usually poor in organic matter, • Some desert soils are alkaline with varying degree of soluble salts like calcium carbonate • Calcium content increases downwards and the subsoil has ten times more calcium. • phosphate content is high but low nitrogen 	<ul style="list-style-type: none"> • possibility of reclaiming these soils if proper irrigation facilities are available as Phosphates and nitrates make these soil fertile wherever moisture is available • drought resistant and salt tolerant crops such as barley, cotton, millets, maize and pulses are grown.
Saline Alkaline soils	Formation: water with high salt concentration becomes stagnant and deposits all the salts in the top soil once the water evaporates. Distribution: Parts of Andhra Pradesh, Telangana, Karnataka, Bihar, Uttar Pradesh, Haryana, Punjab (side effects of improper or excess irrigation), Rajasthan and Maharashtra have this kind of soils; Gujarat-areas around the Gulf of Khambhat ;	<ul style="list-style-type: none"> • saline sea waters infiltrate into coastal regions during storm surges which make coastal soil degradation 	
Peaty- Marshy soils	Distribution: Kottayam and Alappuzha districts of Kerala where it is called kari . Also occur in the coastal areas of Odisha and Tamil Nadu,	<ul style="list-style-type: none"> • large amount of organic matter and considerable amount of soluble salts. 	Most of the peaty soils are under water during the rainy season but as soon

	Sunderbans of West Bengal, in Bihar and Almora district of Uttarakhand.	<ul style="list-style-type: none"> • most humid regions have this type of soil • black, heavy and highly acidic. • deficient in potash and phosphate 	the rains cease, they are put under paddy cultivation
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Soils and Nutrients Table

D- Deficient	R-Rich	A-Adequate	V-Vary
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Name	Nitrogen	Phosphorus	Potassium (K)	Humus	Lime	Iron	Magnesium	Calcium
Alluvial	D	A	A		V	V		
Black	D	D	V	D				
Red	D	D	R	D	D	D	D	
Laterite	D	V	D		D	R	D	
Forest		D	D	R	D			
Arid	D	R		D				R
Saline/Alkaline								
Peaty/Marsh		D	D	R				