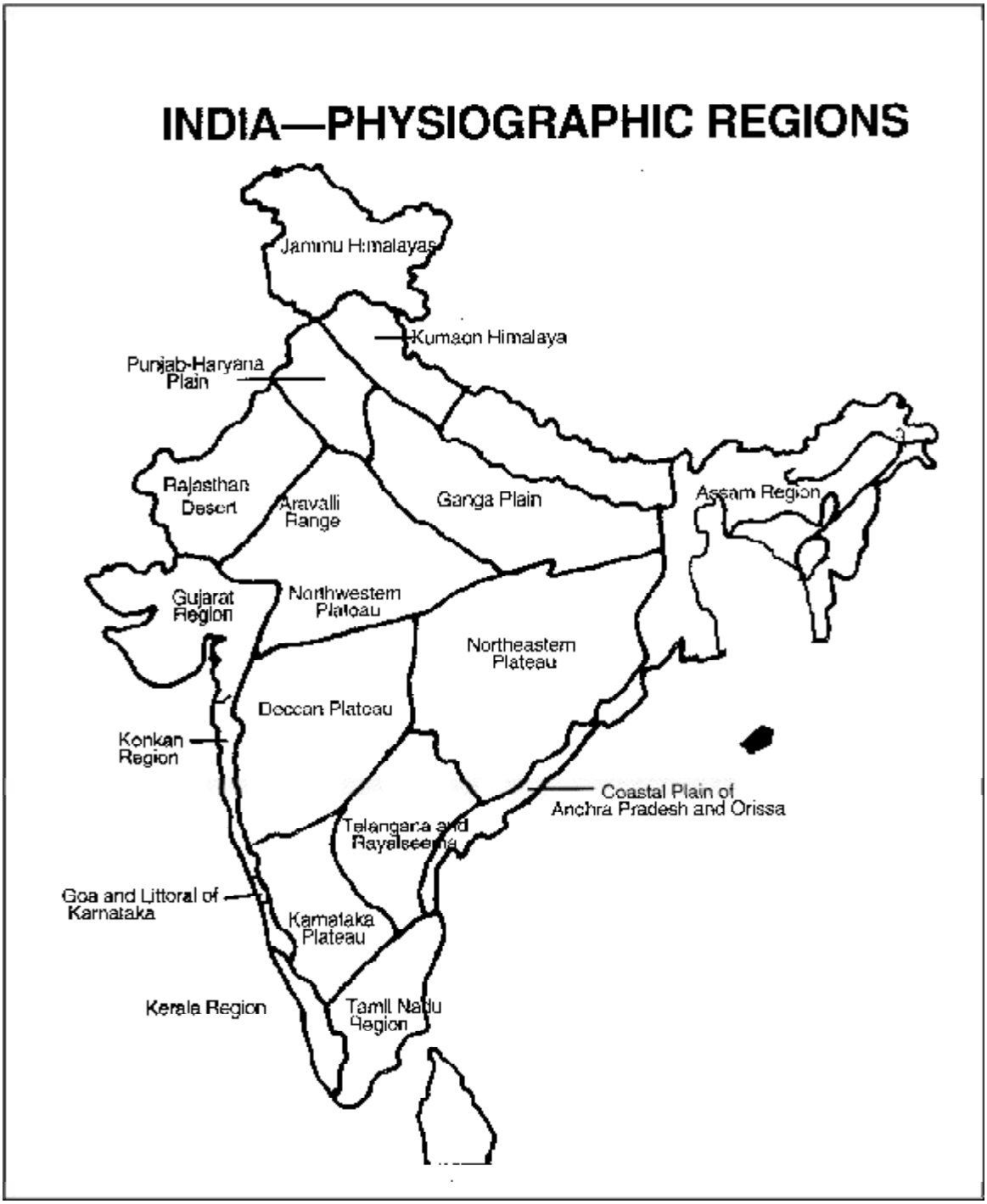
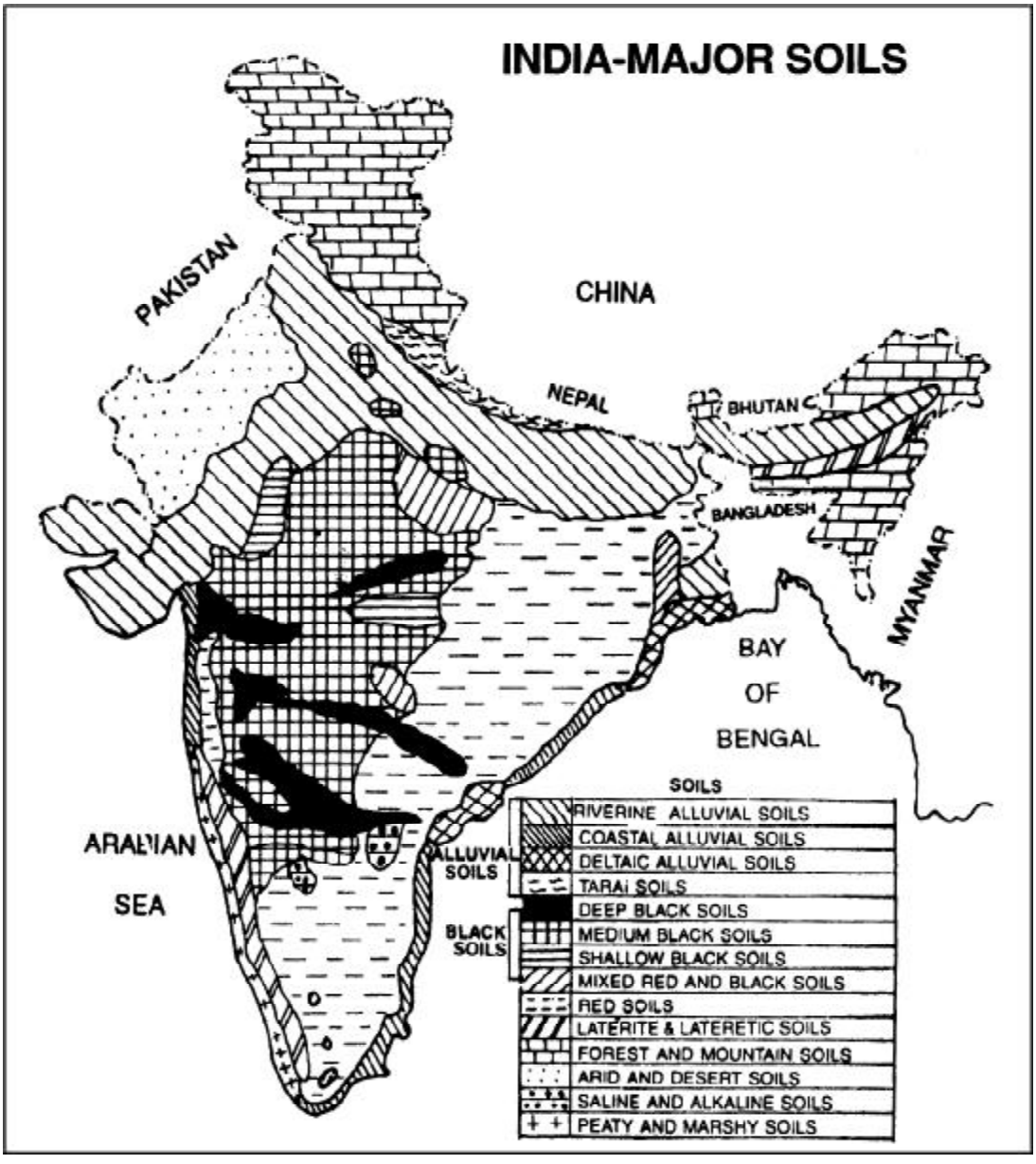


Physiographic Regions

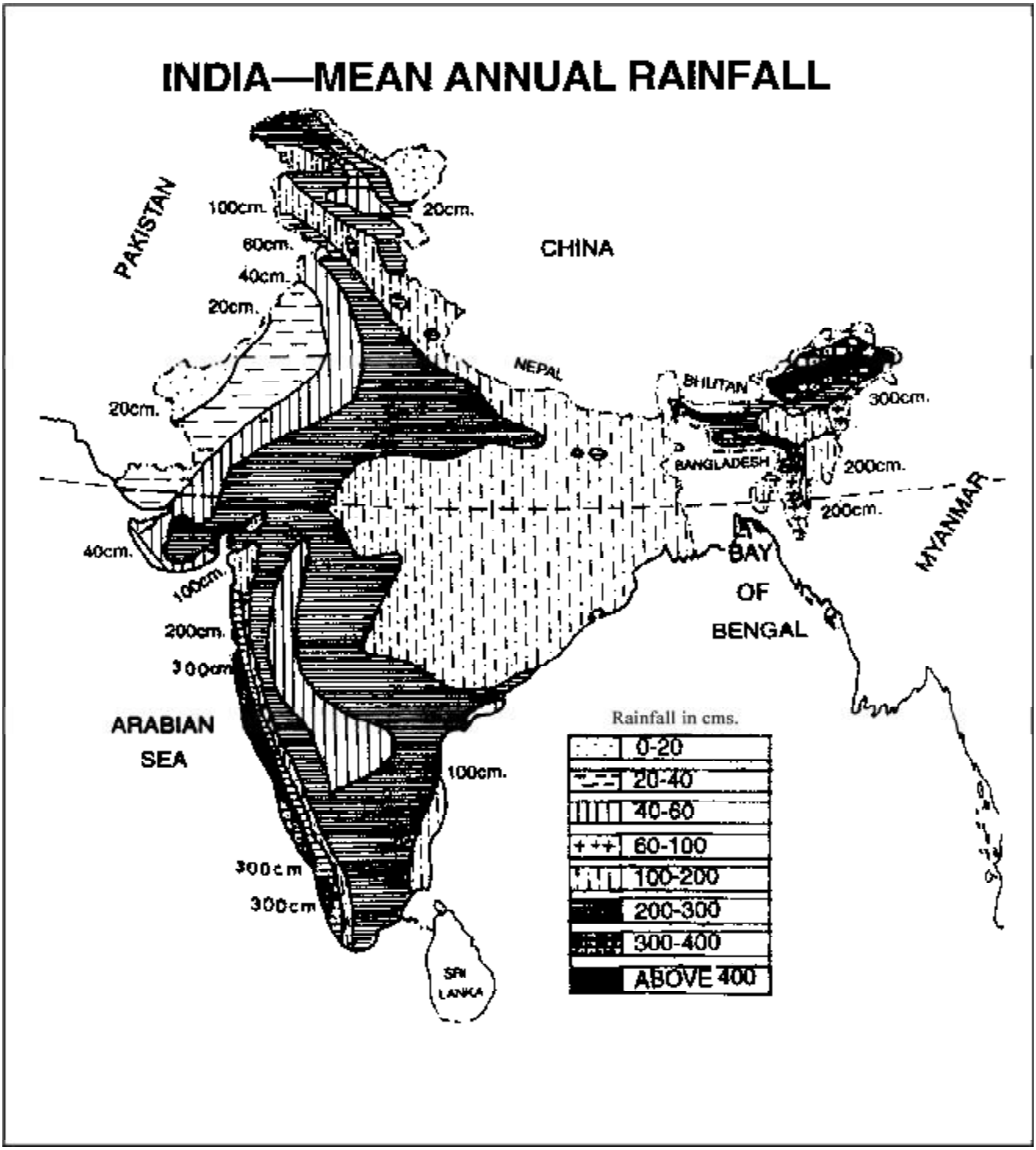
Major Divisions	Criteria For Division
Western Himalaya (i) Jammu and Kashmir state	Comparatively cool, arid and semi-arid over a large area. Rains during summer season occurs only over a small area in the southern part.
(ii) Punjab and Kumaon Himalaya Region (between Neapl in the east to Jammu and Kashmir in the north west.	Wetter, more densely forested and more thickly populated region than Jammu and Kashmir state
Assam Region - includes Arunchala Pradesh, Nagaland, Manipur Mizoram, Meghalaya, Tripura and Assam.	
(i) Assam Himalaya.	
(ii) The Brahmaputra or Assam Valley.	
(iii) The Meghalaya Hills of Shillong Plateau including the Garo, Khasi, Jaintia and Mikir.	It is part of Peninsular plateau and structurally a granitic block.
(iv) The Eastern Highlands	Young fold mountains running from North to South.
The Plains of Northern India	Rainfall is the main criterion used for dividing this alluvial plain into regions.
(i) The West Bengal Plain.	Rice and Jute producing area.
(ii) The West Bengal duars and the Sikkim, Darjeeling, Himalaya	Wetter than West Bengal Plain, semi-evergreen forest and tea plantation.
(iii) The Ganga Plain Comprising alluvial palin of U.P. and Bihar	Decrease in the amount of summer rainfall in the west.
(iv) The Punjab-Haryana Plain Situated to the west of Yamuna and North of arid and semi-arid Rajasthan desert.	Extensive well-irrigation coupled with canal-irrigation in the northern districts.
(v) The Rajasthan desert Situated to the west of Aravalli.	Region deficient in rainfall. Entirely different in character from the highly wet plains of the Ganga and Brahmaputra.
The Indian Plateau	
Deccan Lava Region Includes plateau area of Maharashtra and neigh-bouring states of M.P., A.P. and Karnataka.	Receives annual rainfall. Entirely 50 cm and 100 cm. Region has Black soil and produces cotton, jowar and groundnut.
The North Western Plateau and the Aravalli Range Situatled to the north of Deccan lava region.	Receives less rainfall during summer than the Deccan lava region and is relatively coller in winter.
The Karnataka Plateau Situtated to the East of Karnatak state.	Relatively cooler in summer than neighbouring areas due to its high elevation.
The North Eastern Plateau Situated to the east of the Deccan lava region and includes interior parts of Orissa, the Jharkhand Plateau and eastern M.P.	Region is very rich in minerals.

The Coastal lowlands	More productive soils, heavier rainfall and better irrigation facilities than the Indian Plateau.
Eastern Coastal Region (i) Coastal Plains of Andhra Pradesh and Orissa. (ii) Tamil Nadu Region.	
Western Coastal Region (i) Gujarat Region North of Daman (ii) The Konkan Region between Daman in the north and Goa in the south. (iii) Goa and littoral of Karnataka, Kerala.	Receives rainfall during winter also. Largely semi-arid, millet and cotton producing region. Dominated by port and industries of Mumbai. Plantation and wet crops producing region.



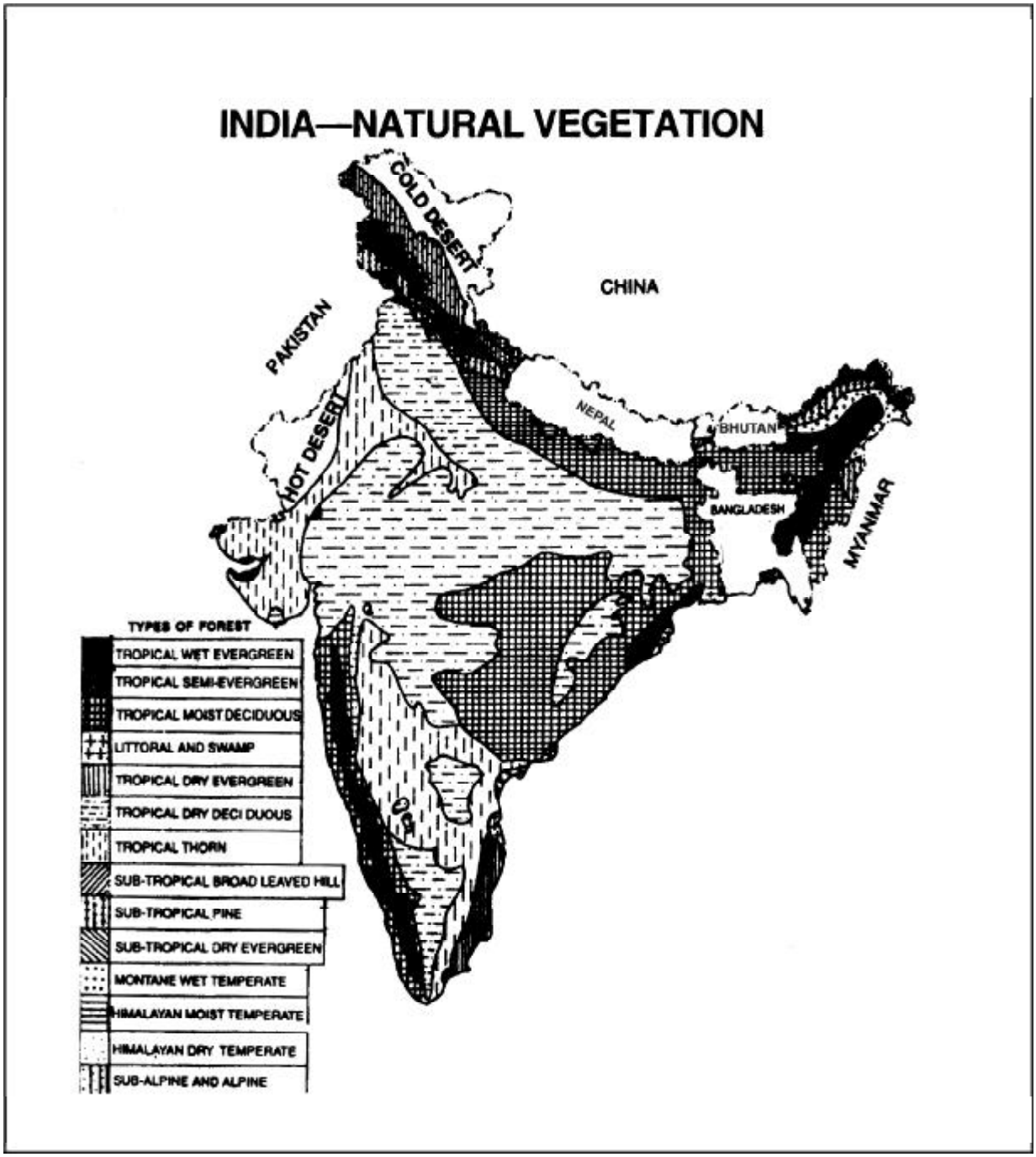
India-Major Soil Types

SOIL TYPE	FORMATION	CHARACTERISTICS	REGION & STATES
Alluvila Soil Distribution: 7.7 lakh km² (24% of the country's total and area)	Formed due to deposition of alluvium brought by rivers over millions of years. Newer alluvium is called khadar and and older allu- Terai soil : Bhabar Infertile soil : Usar	Very fertile soil, rich in potash and lime, deficient in humus, nitrogen and phosphorus.	Northern plains or river basin: Punjab, Haryana, eastern part of Rajasthan, Gujarat, U.P., Bihar, West Bengal, Orissa, vallyes of Narmuda, Tapti, Mahanadi, Godvari, Krishna Cauvery, Brahmaputra.
Black Cotton soil or Regur Soil. Distribution : 5.18 lakh km² (16% of the country's total area).	Formed from Deccan lava, gneiss and granite.	Black in colour due to presence of Fe and Mg Deficient in nitrogen phosphoric acid and organic matter. Rich in potash, lime aluminium and Calcium.	It covers plateaus of Maharash- tra, Saurashtra, Malwa Nor- thern Karnataka, parts of Rajasthan (two district-Bundi and Tonk), central and South Tamil nadu.
Red Soil Distribution: 5.18 lakh km² (16% of the country's total area).	The soil developed on old crystalline rock under mode- rate to heavy rainfall. It is different shades of Red and Yellow.	Red colour due to presence of Fe. Deficient in organic matter, phosphorus, nitrogen and lime content. Potash and alumina content are satisfactory. Acidic like laterite but less leached than laterite soil.	Larger parts of Tamil Nadu, eastern Andhra Pradesh and Karnataka. Southern parts of Maharashtra, Chhattishgarh, parts of Orissa and Chhotanagpur regon.
Laterite Soil Distribution : 1.26 lakh km²	The laterite soil is a result of intense leaching due to heavy tropical rains with alternate wet and dry seasons.	More acidic on higher areas Presence of hydrated oxides of Al and Fe Defi- cient in nitrogen, potash, magnesium and phosphoric acid.	Tropical humid areas where rainfall is more than 200 cm eg., hills of Karnataka, Kerala and Tamil Nadu, West Bengal, Maharashtra and slopes of Eastern Ghats.
Arid or Desert Soil Distribution :	Sand and wind blown. Weathering due to high temperature help in the formation of these soils. Developed under arid or semiarid conditions in the north western part of the country.	Deficient in humus and nitrogen, rich in phosphorus. Due to less leaching mineral content is high.	South-west Punjab, southern Haryana, western Rajasthan and Rann of Kachchh in Gujarat.
Mountain Soils	Formed by the deposition of organic matter derived from the forest growth. Charac- terstic of soil varies with variation of rocks, ground	Rich in humus but deficient in potash, phosphorus and lime. Most suitable for plantation crops like tea, coffee, etc.	Himalayan region of Jammu and Kashmir, Himachal Pradesh. Also in Western and Eastern Ghats as well as in some region of Peninsular plateau.
Peaty and Organic	Developed in hot humid conditions as a result of accumulation of large amount of organic matter.	Dark and almost black in colour, very strongly acidic and saline.	They are confined to depression caused by dreid lakes in alluvial and coastal plains areas and developed under water logged environments. For example, Regions, like Kari in Kerala, Tamil Nadu, coastal Orissa, West Bengal and Bihar.



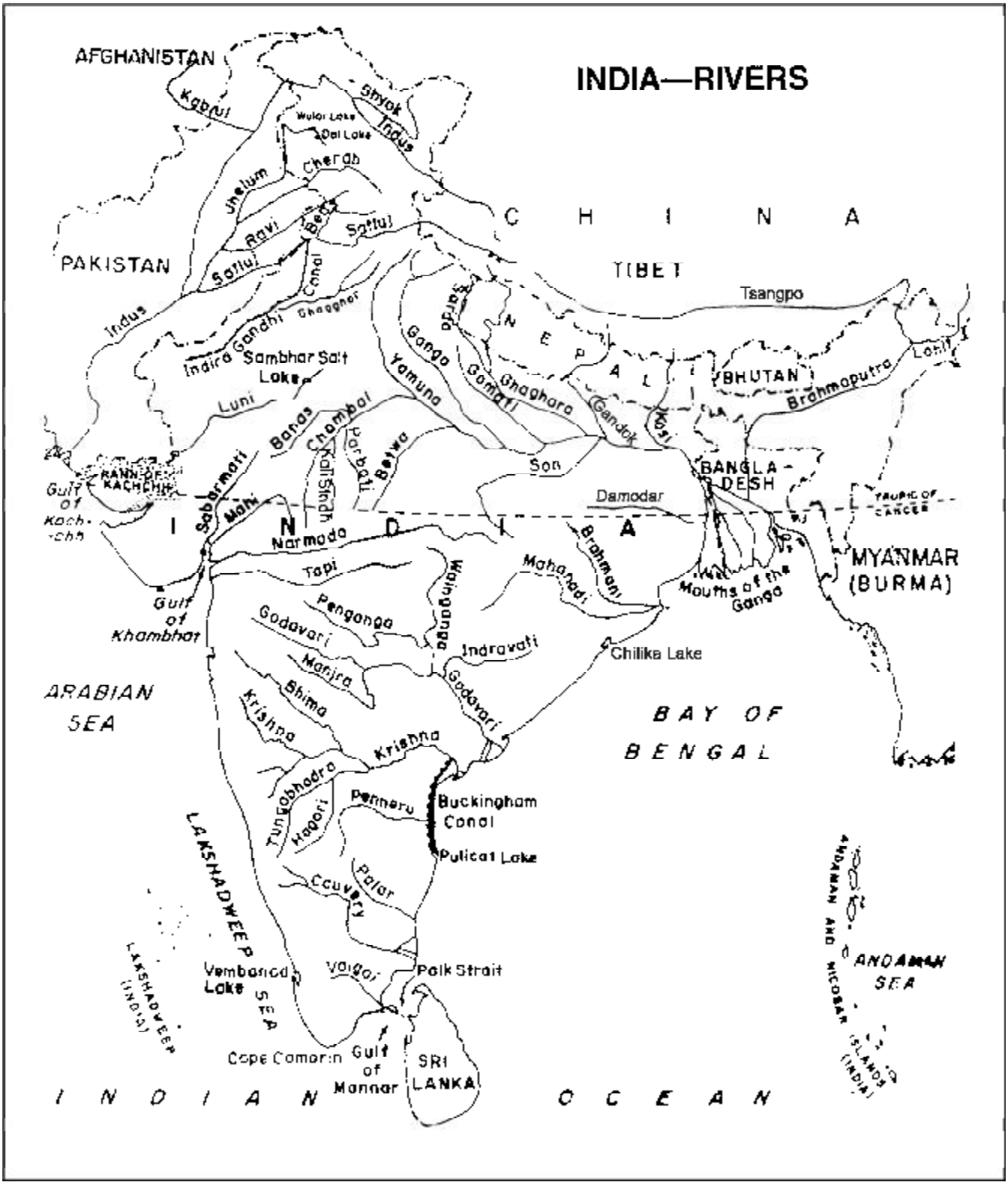
Mean Annual Rainfall

Areas of Heavy Rainfall	Areas of Moderate Rainfall	Areas of Scanty Rainfall
Rainfall between 200-400 cm	Rainfall between 100-200 cm	Rainfall between 40-60 cm
The Arabian Sea branch of south west monsoon causes rainfall all along the Western Ghats, west coast of Maharashtra, Gujarat, and parts of M.P. from June to September.	The average rainfall over North Indian Plain generally remains between 100 to 200 cm. Other areas of moderate rainfall are northeastern parts of Peninsular India, highlands of Central India, and Tamil Nadu.	Parts of Punjab, Haryana, northern and western Rajasthan and Kachchh and Kathiawar regions of Gujarat. A narrow strip of land, lying in rain shadow areas of Peninsular India receives rainfall below 60 cm.
In north East India, the Bay of Bengal branch of monsoonal winds which causes monsoon in the southern hills of Shillong Plateau, Garo, Khasi, Jaintia hills (Meghalaya) and other states.	Rainfall between 60-100 cm occurs in the upper Ganga Valley, eastern parts of Aravallis, eastern Gujarat, internal parts of Andhra Pradesh, Tamil Nadu, Maharashtra and Karnataka.	The dry regions of Rajasthan, west of the Aravalli hills receives rainfall below 20 cm, Northern parts of Gujarat and Jammu and Kashmir are other regions which receive scanty rainfall.
In these regions orographic important role because the moisture laden monsoon winds strike against physical barriers like mountains, to casue heavy rainfall.	The intensity of rainfall decreases from east to west and north to south in the Northern Plains.	Areas of Winter Rainfall (i) The northwestern parts of India-Jammu & Kashmir, Punjab and U.P. plains (ii) Coastal Tamil Nadu: Rainfall due to North East monsson.



India - Natural Vegetation

VEGETATION REGIONS	RAINFALL	AREAS	GROWTH OF VEGETATION	TREES
Tropical Wet Evergreen Forests	Annual rainfall above 250 cm. Region is warm and wet throughout the year.	Found in areas below 900 m. in western Ghats, and in patches in Tamil Nadu, Karnataka, Keral,a Submontane West Bengal, coastal, Orissa, Andaman and Nicobar Islands and North Eastern re gion.	Trees do not shed their leaves and are in form of three or four storeys.	Chiefly of hardwood type. *Rosewood, Ebony Mahogany, Abnoos, Bamboo, Rubber, Cinclona Sandal,* etc.
Tropical Dry Evergreen Forest	Annual rainfall between 100 cm-125 cm.	Assam, West Bengal coastal Orissa and in Western Ghat form a narrow belt along the eastern border of evergreen forest.	Less dense tree canopy with heavy climbers and epiphytes in abundance. Represent a transition from wet evergreen to deciduous forests.	Evergreen mixed with those of deciduous type. Important trees are *Kadam, Laurel, Rosowood, Kanju, Champa and Mango.*
Tropical Deciduous Forests.	Rainfall less than 200 cm Rainfall b/w 156-200 cm-Monsoon forests Rainfall <156 cm-tropical dry deciduous.	West Bengal, Orissa, Eastern parts of M.P., Chhotanagpur Plateau The Eastern slope of Western Ghats. Lower parts of Himalaya.	The trees shed their leaves, six to eight weeks in summer to minimise the transpiration.	Sal in north, Teak in central and western parts, Sandal in southern part, *Sisso, Mahua, Neem Khair, etc.*
Tropical Thorn Forests.	50-75 cm rainfall.	Interior Peninsula, Eastern Rajasthan, east and north Punjab north Gujarat and parts of Andhra Pradesh.	Deciduous with low thorny trees, reaching hardly the height of 10m, with a light canopy.	*Acacia, Babool, Khair* and *Date palm* etc.
Desert Vegetation	Annual rainfall between 10-50cm	Western parts of Rajasthan.	Plant generally grow in the form of bushes which are widely scattered.	Cactus, Thorny Bushes etc.
Tidal or Swamp Forests	Area under moderate rainfall between 40 to 200 cm.	Thickest at some places in Western coast and continues along Ganga, Mahanadi Krishna, Godavari and Cauvery delta. Best example Sunderbans.	The salt water due to tidal waves is mixed with fresh water near lowlying coastal areas help to grow such vegetation. They have stilt like roots and numerous climbers.	Mangroves include Sundari, Coconut, etc. Pines, Keora, Canes, Crew, etc.
Himalayan Forests	Rainfall between 75 to 125 cm.	Mountaineous area of the Himalayas, Jammu & Kashmir, Himachal Pradesh, Sikkim and	Varies in attitude and is an important consideration of vegetation in mountaineous regions.	Broad leaves and conical shaped trees are main vegetation, for e.g., Pine, Oak, Chir in Western Himalaya; Oak, laurels and chest nuts in Eastern Himalayas; Confiers, silver fir, blue pine, deodar in Western Himalayas.
Sub-tropical Wet Hill Forests.	Rainfall between 150-300 cm.	Above 900 m in Eastern Himalayas and Western Himalayas.	Mixed forests of brand leaved and conifers	Pines and oak.
Temperate Forests		Above 1,830 m in Eastern Himalayas and above 1,500 m in	Evergreen coniferous	Deodara, Indian, Chestnut Magnolia, Blue pine oaks and Hemlock.
Alpine Forests		Between 3,650 m Eastern Himalayas.	The plants are and close with or without conifers.	Spruce, Fir, Birch, Junipers and Rhododeneron



Information about Himalayan Rivers

The Indus systgem (Indus and its tributaries)				
Rivers	Source Length (Km)	Total (Sq. Km)	Rivers Basin	Information
(i) Indus (one of the world's largest river).	Tibet at an altitude of 580 m near Mansarovar Lake	2,880 (709 in India).	3,21,290 in India	• Mountain tributaries; Gilgit, Shyok, Skardu, Shigoo. • Plain tributaries; Jhelum, Chenab, Ravi, Sutlej and Beas.
Jhelum (An important river of Kashmir and is the main water-way).	Rises in Verinag at the foothills of Pir Panjal.	400	28,490 (in India).	• Its basin lies between Great Himalaya and Pir Panjal Range. • It flows through Vale of Kashmir and Wular Lake before entering into Pakistan.
Chenab (largest of all the Indus tributaries).	Rises in snow covered Kullu hills of Himachal Pradesh	1,800 (in India).	26,755 (in India).	• Flows through Chamba state for 160 km in the through between the the Greter Himalaya and the Pir Panjal.
Ravi	Kullu hills of H.P.	725	5,927 (in India).	
Satluj (second largest tributary of Indus).	Rakas Lake, at an altitude of 4,555 m in Tibet.	1050 (in India).	24,087 (in India).	• It enters India through Shipki La and flows through Himachal Pradesh and Punjab before entering into Pakistan.
Beas	Kullu Hills at an altitude of 3960 near Rohtang Pass in Himachal Pradesh.	460 (in India)	20,303 (in	• It joins Satluj near Harike.
The Ganga System (Ganga and its tributaries)				
The Ganga Formed by two head streams Alaknanda and Bhagirathi which join at Devprayag	Rices in Gangotri glacier of the Great Himalaya. Above Devaprayag it is called as Bhagi-rathi and below it is referred to as the Ganga	Of its total length of 2,525 km, 1450 km in Bihar and 520 km in West Bengal.	8,61,404 sq. km. Largest river basin in India. Cover more than fourth of the country's total surface.	• Left Bank tributaries; Ramganga, Gomti, Ghaghara, Gandak, Burhi Gangak, Kosi. • Right Bank tributaries; Yamuna, Son. • The Bhagirathi-Hooghly is the western most distributary of the river. • Beyond Farakka it bifurcates itself into Bhagirathi-Hooghly in West Bengal and Padma-Meghna in Bangladesh.
The Yamuna (Largest and the and the most important tribu-tary of Ganga)	Rises in the Yamu-notri glacier which is west of Ganga source.	1300 km from its source to Allahabad	3,59,000	• Important tributaries; Chambal (rises in Mhow in the Vindhya) Sone. Betwa and Ken. • It joins Ganga at Allahabad.
The Son (Right bank tributary of	Rises from the Amarkantak Plateau.	780	71,900	• It joins Ganga near Maner near Patna.
Ramganga	Rises in the Kumau	696	32,412	• It joins the left bank of Ganga below Farukkhabad.

Ghaghara	Rises from east of Gangotri.	1080	1,27,500 sq. km. - more than half of its basin is in Nepal.	• It joins left bank of Ganga near
Gandak	Rises near the Nepal-China border at an altitude of 7,600 m in the Central Himalaya.	425 (in India).	9,540 (in India).	• It flows through central part of Nepal, enters Bihar in Champaran districts and turns south east to join the left bank of Ganga near Sonepur.
Kosi (formed by the confluence of the Son Kosi, and the Tamur Kosi.	rises from the peak of Nepal-Tibet.	730 (in India).	11,600 (in India).	• It flows through eastern Nepal, enters Bihar in Saharsa district and joins the left bank of Ganga below Bhagalpur (Bihar). • The river is notorious for shifting its course and causing floods, thus often termed a sthe 'Sorrow of Bihar'.
Damodar	Rises in Chhota Nagpur plateau in Palamau district (Jharkand).	541	22,000	• It joins the Bhagirathi - Hooghly in West Bengal. • Also known as 'Sorrof of Bengal'.
The Brahmaputra System (Brahmaputra and its tributaries)				
Brahmputra or Tsangpa (Tibet) One of the longest rivers of the world.	Rises in the Chemayungdung glacier in the Kailash Range and Mariam La pass separates it from Mansarovar Lake.	2,960	2,40,000	Important tributaries: Subansiri, Kameng, Dhansiri, Dihang, Lohit, Tista, Torsa, Manas; Burhi Dihing, etc. It flows through Tibet, India and Bangladesh and forms the largest delta of the world along with Ganga.

Information about the Peninsular Rivers

East flowing Rivers				
Peninsular Rivers	Source	Length (KM)	River's Basin Area	Information
Mahanadi (An important river of the Peninsular Subarnarekha, Brahmi and Baitarni.	Northern foothills of Dandakarnaya near Shiawa in Raipur	857	141,600 dq. km (in M.P., Orissa, Bihar and Maharashtra).	Left bank tributaries; Sheo-nath, Hasdeo, Ib and Mand. Right bank tributaries; Tel, Ong, and Jonk. These small river basins are interposed between the Ganga and the Mahanadi basin.
the Godavari river system (Godavari and its tributaries)				
Godavari	Trimbak plateau of north Sahyadri near Nasik (Maharashtra).	1465 (longest river of Peninsular India).	3,12,812 half of which lies in Maharashtra and also in Andhra Pradesh, M.P., Orissa and Karnataka	Largest river system of the Peninsular India and is next only to the Ganga system in India. Left Bank tributaries; Penganga, Wardha, Wainganga, Indravati and Sabri. Right bank tributary Manjra.

Krishna River system (Krishna and its tributaries)				
Krishna (second largest east flowing river of Pinunsula).	North of Mahabale-shwar in the Western Ghats.	Flows for a distance of 1,400 km to the Bay of Bengal.	2,58,948 sq. km. Lies in Karnataka, Andhra Pradesh and Maharashtra.	Important tributaries: Bhima, Tungabhadra, Ghat, prabha, Malaprabha, Musi and Koyna.
Cauvery	Rises in the Brahmgiri Range of Western Ghats.	800 km	87,900 sq. km.- shared by Kerala, Karnataka and Tamil Nadu.	Left bank tributaries:Herangi, Hemavati, Shimsha, Arkavati etc. Right Bank tributaries: Kabani, Bhavani and Amravati, etc.
West Flowing Rivers				
Sabarmati	Mewar hills in Aravalli Range.	320 km	21,674 sq. km. share by Rajasthan and Gujarat.	Important tributaries: Hathmati, Sedhi, Wakul, etc.
Mahi	Vindhya Range at an altitude of 500 m.	533 km	34,862 sq. km.	Madhya Pradesh, Rajasthan and Gujarat share the river basin.
Narmada (largest west flowing Peninsular river).	Rises in Amarkantak in Madhya Pradesh	1312 km (from its source to estuary in the Gulf of Khambhat).	98,796 sq. km which is shared by M.P. Gujarat and Maharashtra	Left bank tributaries: Tawa, Burhner, etc. Right Bank tributary: Hiran World's famous *Dhuan Dhar or Cloud of Mist Falls* is located on this river near Jabalpur. It flows through a rift valley between the Vidhyas and the Satpura Range.
Tapi or Tapi (Second largest of west flowing river of Peninsula).	Rises near Multai on the Satpura Range in Betul	740	65,145 sq. km. (in M.P., Maharasthra and Gujarat).	Left bank tributaries: Purna, Veghar, Girna, Bari and the Punjhara. Right bank tributaries: Betul, Arunavati, Ganjal and Gomai. It is also known as the 'twin' or handmaid' of the Narmada.