INDIA PHYSICAL GEOGRAPHY

IMPORTANT MOUNTAIN RANGES

KARAKORAM RANGES:

1. Extends form the Pamir, east of the Gilgist River, 600 km long and the average width 120-140km.
2. Ancient name was Krishnagiri.
3. Trans Himalaya, originally a part of Eurasian plate.
4. Abode of largest glaciers in India.
5. Siachen, Baltora, Biafo, and Hisper all the four of largest glacier are in Karakoram.
6. Highest Peak: K2 or Godwin Austin (8611m)
7. Other important Peak: Gasherbrum or Hidden Peak Broad Peak and Gasherbrum II
8. In the northern limit of Karakoram Range lies Pamir, the Aghil Mountains and the Yarkand River and in the southern limit Rive Indus and its tributary Shyok.

LADDAKH RANGE

1. Situated to the north of Indus Tsangpo Suture Zone (ITSZ) and south or Karakoram, between River Indus and Shyok.
2. Highest Peak: Mt.Rakaposhi (steepest peak in the world)

(A) GREAT HIMALAYA OR HIMADRI

1. Northern most part of the Himalayan Range is the world’s highest with an average altitude of 6,000m.
   2. include the word’s highest peak, Mt. Everest(8,848 m), Makalu (8,481m) Mansalu (8,156m), Annapurna(8,078m) and also the Indian peak Kanchenjungs (8,598 m) and Nanga Parbat(8,126m)

**ZASKAR RANGE**

Western part of the main Great Himalayan Mountain is situated to the south of Trans Himalayan.

**Nanga Parbat (8,126m)**

Forms the north-west part of Zaskar Range but geographically confined to the Kashmir, Himachal Pradesh, Garhwal region.

Second highest peak of the Himalayan Range in India.

**Dhalagiri (8,172 m)**

Eastern continuation of Nanga Parbat and is located in Nepal.

**(B) LESSER HIMALAYA**

Also known as Himachal-Himalaya which is separated from the Shiwalik Range by Duns.

**(I) PIR PANJAL RANGE**

Located in Kashmir, Punjab and extends from the Jhelum River to the upper Beas River for over 300km.

Separated form the Zaskar Range by the valley of Kashmire (vale of Kashmir)

**(II) DHAULADHAR**

Southern-most range of the Lower or Lesser Himalaya.

Rarely attains elevations higher then 4,000m

Continue eastward in to Mahabharat Range.

**C)SIWALIK RANGE**

Extends from Jammu & Kashmir (150km wide) to Arunachal Pradesh (8-15km) over 2400km.
Northern limit-Main Boundary thrust which separates Outer Himalaya from the Lesser Himalaya. Its southern limit is Indo Gangetic Plain.

Also known as Sub-Himalaya or Outer Himalaya.

Youngest part of mountain chain stretching form the Brahmaputra to the Indus.

Separated from Lesser Himalaya by Main Boundary Thrust.

**CLASSIFICATION OF HIMALAYA ON THE BASIS OF GEOGRAPHICAL LOCATION:**

<table>
<thead>
<tr>
<th>NAME</th>
<th>LOCATION</th>
<th>DISTANCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Punjab Himalaya</td>
<td>Between Indus and Sutlej</td>
<td>560 km</td>
</tr>
<tr>
<td>2. Kumaon Himalaya</td>
<td>Between Sutluj and Kali</td>
<td>320 km</td>
</tr>
<tr>
<td>3. Nepal Himalaya</td>
<td>Between Kali and Tista</td>
<td>800 km</td>
</tr>
<tr>
<td>4. Assam Himalaya</td>
<td>Between Tista and Dihang</td>
<td>720 km</td>
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</tbody>
</table>

**THE PURVANCHAL**

*(The North Eastern Highland)*

The Himalaya range after crossing the Dihang gorge in the east, bend southwards, forming a series of hills, in north south trend.

Hills, North Cachar Hills and the Tripura Hills.

**PURU NEFA**

(I) **Mishmi Hills**

The highest range of Purvanchal Hills which is situated in the north-eastern part of Arunachal Pradesh.

(II) **Patkai Bum**

A synclinal range extending north south in Arunachal Pradesh and Nagaland.
NAGA RANGES
Forms watershed between Nagaland and Myanmar.

MANIPUR HILLS
Characterized by ridge and valley type of topography
Loktak lake (centripetal drainage) is situated in this hill.

NORTH CACHAR HILLS
Larger portion of hilly belt lying between Meghalaya and the North eastern ranges.

MIZO HILLS
Previously known as Lushai Hills
Characterised by cuesta type of topography

TRIPURA HILLS
Characterised by ridge and valley topography

THE NORTHERN PLAINS OF INDIA
East-West Extent 2,400 km (3,200 km if the Indus plains are included)
Average width:150-300km
1. Largest alluvial tract of the world, extending from the mouth of Indus to the mouth of Ganga between Peninsular plateau and the northern are of the mountains.
2. Alluvial in nature, and are composed of Bhangar (old alluvium), Khadar (new alluvium) in river bed. Bhabar (porous gravel ridden plains at the foot of Himalaya) and Terai (damp thickly forest area, where bhabar stream reappears)

SUBDIVISION OF GREAT PLAINS

THE RAJASTHAN PLAIN
Extent:650km long.
Average width:250-300 km wide
Thar or Great Indian Desert is the westernmost region of Great Indian Plains in the western Rajasthan.
A semi arid plain, lying to the east of Thar desert is known as Rajasthan Bagar.

The Luni is the only southwest flowing rivers of this region.

The Sambhar(largest), the Kuchaman, and the Didwana are important lakes situated to the north of Luni Basin.

**THE PUNJAB HARYANA PLAINS:**

Extent: 640km in northwest to southeast and 300km in east west direction.

Extends from Punjab in the west to Yamuna River(Haryana) in the east.

Land of five rivers is primary made up of ‘doabs’- the land between two rivers.

They are composed by Bet(Khadar plains) and Dhaya(Heavily gullied bluffs).

**THE GANGA PLAINS:**

The largest Great Plain stretching from Delhi to Calcutta across the states of Uttar Pradesh, Bihar and West Bengal.

The Ganga and its tributaries like Yamuna, Ghagra, Gomti, Kosi, and Son deposit large amount of alluvium and make this extensive plain more fertile.

They comprise of Gango-Yamuna Doab in the west, to the east of this Doab are the Rohilkhand plains which merges which merges with Avadh plain in the east.

**THE BRAHMAPUTRA PLAIN**

The low level plain formed by the Brahmaputra river system is situated between Eastern Himalaya (Arunachal Pradesh) in the North, Patkai and Naga hills in the east, Garo-Khasi-Haintia and Mikir Hills and lower Ganga Plain and Indo Bangladesh border in the west.

**PENINSULAR MOUNTAINS**

Total length: 800km

Highest peak: Guru Sikhar(1,722m) of the Abu Hills.

Extending from the north east to the south-west of India and separates to semi desert regions of Rajasthan from the fertile Udaipur and Jaipur regions.

It is an example of relict mountain
One of the oldest fold mountains in the world.

**VINDHYAN RANGE**
A block mountain which separates northern India from the southern mainland.
Composed of sandstones, shales and quartzites.
South of it, Narmada River flows in the rift valley.
Acts as a natural watershed between north and south India.

**SATPURA RANGE**
Highest peak: Dhupgarh(1,350m) near Panchmarhi.
Average elevation: 1,030m above sea level.
Extending in east west direction, to the south of Vindhyan.
Situated between Narmada and Tapi River.
Starting from Rajpipla hills in the west through Mahadeo hill to Maikal range.

**MAIKAL RANGE**
Eastern part of Satpura system is situated in Madhya Pradesh.
Mount Amarkantak is the highest peak

**AJANTA RANGE, BALAGHAT RANGE, AND HARISH CHANDRA RANGE:**
Extending in east west direction, are all spurs of Western Ghats forming local watersheds.
Kalsubai(1,646m) the highest peak of Western Ghat forming local watersheds.

**NILGIRI HILLS**
It is the meeting point of Western and Eastern Ghats.
Doda Betta(2,637m) is the highest peak of Nilgiri Hills.
The hills are separated from southern hills by a gap called Palghat Gap

**ANAIMALAI HILLS**
Anai Mudi(2,695m) the highest peak of South India is in Anaimalai Hills.

**CARDAMON HILLS**
It is situated in the extreme south of Peninsular India
Formed of gneisses and schists.
RAJMAHAL HILLS
Extends in north south direction and is situated in the northeaster edge of the Chhotanagpur Plateau.

SAHYADRIS (WESTERN GHATS)
Total length: about 1600km
Average height: 1200m
Highest Peak: Kalsubai (1646m)
Runs along the western coastal plain from the south of valley of Tapi to Kanya Kumari, the southern most point of mainland India.
Region which receives maximum rainfall and is covered with evergreen forest
The Western Ghats meet with Eastern Ghats in the Nilgiri hills.
Acts as a main watershed of Peninsular rivers.

EASTERN GHATS:
Runs along the eastern coast of India from northern Orissa to the Nilgiri Hills.
Characterised by unbroken hills between Mahanadi and Godavari.
Mahendragiri is the highest peak of Eastern Ghats.
Nallamalli Hills is situated between Krishna and Penneru Rivers.

THE INDIAN PLATEAU

BUNDELKHAND BHANDER, BAGHEL AND MALWA PLATEAU
These highlands are situated to the north of Narmada rift valley.
Bundelkhand Plateau is a part of central highlands and is composed of granite and gneisses.
Malwa plateau is an example of dissected lava plateau, which is covered with black soil.

MEGHALAYA PLATEAU
It comprises of Garo, khasi and Haintia Hills.
Originally a part of Peninsular plateau.
Garo-Rajmahal Gap separates it from the main block of peninsular plateau

**CHOTANAGPUR PLATEAU**

Highest peak- Parasnath (1,366m) in the Hazaribagh Plateau.

Situated in the north eastern part of Indian Plateau includes the region of Bihar, adjoining Madhya Pradesh and West Bengal.

It consists of the Ranchi Plateau in the south, the Hazaribagh Plateau in the north, and the Rajmahal Hills in the northeast.

Described as the “Ruhr of India”

Pothills are one of the chief characteristics of Chotanagpur Plateau.

Very rich in mineral resources.

**DECCAN PLATEAU**

South of the Satpura Range in the peninsula is called the Deccan Plateau.

1) **The Deccan Lava Plateau Region**

Northwestern part of Deccan Plateau is the region of Basaltic lava.

It includes the Western Ghats north of 16° north latitude, plateau of Maharashtra (except the east of Nagpur) and the adjoining parts of Madhya Pradesh, Karnataka and Andhra Pradesh.

2) **Telengana Plateau**

Part of the Deccan Plateau, comprises of the interior region of Andhra Pradesh.

North of Krishna River is the plateau of Telengana.

South of the Krishna River, lying in the Rayalseema plateau region.

3) **The Karnataka Plateau**

Situated to the south of Deccan Lava Region.

Malnad and Maidan are two physiographic regions of Karnataka plateau.

**Malnad**

Hilly and dissected plateau region about 64km wide lying close to the Western Ghats.

(ii) **Maidan**
Situated in the eastern part of Malnad, relatively large rolling plains with low granitic hills.

**THE WEST COASTAL PLAIN**

Runs from Rann of Kachchh to Kanyakumari and are confined to a narrow belt about 10-15 km wide.

**KATHIAWAR COAST (Total length: 500km)**

The West Coastal Plain between Daman in the north and Goa in the south is examples of coast of submergence due to vertical movements, and is consequently dissected.

Coastal lowland is uneven and is interspersed with river valleys, creeks and ridges.

(iii) **Malabar Coast**

Extends from Goa in the north to Kanyakumari in the south is a coastline of emergence.

Southern coastal region receives more rainfall during summer monsoon season.

**THE EAST COASTAL PLAIN**

Extends from the deltaic plains of the Ganga in the north to Kanyakumari in the south for 1100 km with an average width of 120km.

(I) **UTKAL COAST**

Extends for about 400km from deltaic plains of the Gango to the Mahanadi delta.

(II) **ANDHRA COASTAL PLAINS**

Extends from the southern limit of Utkal plains to Puliant lake (Andhra Pradesh).

It has large deltas of the Krishna and the Godavari rivers.

(III) **TAMIL NADU PLAINS**

Extends about 675km, from the north of Chennai to Kanyakumari in the south.

It has the deltaic plains of Kaveri and is popularly called the Granary of South India.

**IMPORTANT GULFS**

**GULF OF KACHCHH**
Separates:
Kachchh and Kathiwar Peninsula.
Location: West of Gujarat
Information: Region with highest potential of tidal energy generation.

GULF OF CAMBAY
Separates: Kathiawar Peninsula and Gujarat
Location: Gujarat
Information: Tapi, Narmada, Mahi and Sabarmati river drain into the Gulf.

GULF MANNAR
Separates: Sri Lanka and Southern India
Location: South east of Tamil Nadu
Information: Asia’s first marine biosphere reserves.

IMPORTANT LAGOONS AND LAKES

VEMBNAD LAKE
State: Kerala
Information: Large sized lagoons of Kerala, have fertile alluvial islands, 63 km in length.

KAYALS
State: Kerala
Information: Popularly called back water in Kerala.
A chain of lakes which are connected with each other by canal.
Peaty soils of backwaters are called Kari in Kerala.

CHILKA LAKE
Maximum length -64km
Maximum breadth- 20km
Average width -150km
State: Orissa
Information: Situated to the south west of the Mahanadi Delta.
Enclosed by the sand pit, has an opening which permits sea connection.
Largest brackish water lake in Asia.

**FRESH WATER LAKE**

**WULAR LAKE:**
State: Jammu and Kashmir
Information: Largest fresh water lake of India

**KOLLERU LAKE:**
State: Andhra Pradesh
Information: A part of the sea enclosed between the deltas of Godavari and the Mahanadi and has a number of islands in it.

**PULICAT LAKE:**
State: Andhra Pradesh
Information: Situated on the southern border of Andhra Pradesh.
Lagoon formed due to enclosure by sand bar.

**JAISAMAND LAKE:**
State: Rajasthan
Information: Largest fresh water lake of Rajasthan

**NAKKI LAKE:**
State: Rajasthan
Information: A small natural lake near Mt. Abu surrounded by hills important as tourist place.

**LOKTAK LAKE:**
State: Manipur
Information: Site hydroelectricity power generation an example of centripetal drainage.

**SALINE WATER LAKES:**

**SAMBHAR LAKE**
State: Rajasthan
Information: Largest Lake of Rajasthan lies on the border of Jaipur and Nagaur District.

Sodium chloride (common salt) and sodium sulphate are produced mainly by the Hindustan Salt Ltd.

**DEEDWANA LAKE**

State: Rajasthan

Information: Situated near Deedwana Town of Nagaur District.

**GEOLOGY TIME SCALE**

<table>
<thead>
<tr>
<th>CENOZOIC ERA</th>
<th>HOLOCENE</th>
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</thead>
<tbody>
<tr>
<td>PLEISTOCENE</td>
<td>From upper Pliocene to Pliocene</td>
<td>Upliftment of Outer Himalayas(Siwalik). Main Boundary Thrust(MBT)formed.</td>
<td></td>
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<tr>
<td>PLIOCENE</td>
<td>From Miocene to Pliocene</td>
<td>Main Central Thrust(MCT)formed. Upliftment of Lesser Himalaya(Second Phase)</td>
<td></td>
</tr>
<tr>
<td>OLIGOCENE</td>
<td>From Ecocene to Oligocene</td>
<td>Upliftment of Central Himalaya.</td>
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<tr>
<td>ECOCENE</td>
<td></td>
<td></td>
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<tr>
<td>PALAEOCENE</td>
<td>From the Cretaceous to Eocene</td>
<td>Collison of Indian and Eurasian plate begins.(Continet continent collision)- Indus Tsangpo Suture Zone formed (ITSZ)formed.</td>
<td></td>
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<tr>
<td>MESOZOIC ERA</td>
<td>CRETACEOUS</td>
<td>Extensive eruption of basalt leading to formation of Deccan Lava Plateau.</td>
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<td>(LATE)</td>
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<tr>
<td>Era</td>
<td>Period</td>
<td>Description</td>
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<tr>
<td>PRECAMBRIAN</td>
<td>UPPER PROTEROZOIC</td>
<td>Vindhyan syncline-devoid of metalliferous minerals. Vindhyan Mountain – formed of shales, slates, clay and limestone</td>
<td></td>
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<tr>
<td></td>
<td>MIDDLE PROTEROZOIC</td>
<td>Satpura, Shillong Plateau Formation and deposition in Cuddapah depression.</td>
<td></td>
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<tr>
<td></td>
<td>EARLY PROTEROZOIC</td>
<td>Delhi Aravalli orogeny took place</td>
<td></td>
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<tr>
<td></td>
<td>CLOSE ARCHEN</td>
<td>Dharwar system-cover whole length of Karnataka(region with rich iron ore reserves)</td>
<td></td>
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<tr>
<td>PALAEOZOIC ERA</td>
<td>UPPER</td>
<td>From Carboniferous to Permian Deposition in three great graben like basins Mahanadi, Damodar and Godavari Known as Gondwana deposits.(Region with rich coal reserves)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>LOWER</td>
<td>From Cambrian to Carboniferous(Early) Formation conspicuously absent</td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>Enclosure of Tethys which start shrinking.</td>
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<tr>
<td>LATE ARCHEAN</td>
<td>Peninsular Gneiss and Eastern Ghat formation</td>
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<tr>
<td>MIDDLE ARCHEAN</td>
<td>Singhbhum &amp; Keonjhar Orogeny (rich iron ores reserves)</td>
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</tbody>
</table>

PHYSIOGRAPHIC REGIONS

MAJOR DIVISIONS:

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 Kumaun:

Himalaya Region (between Nepal 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

Arunachal Pradesh, Nagaland, Manipur, Mizoram, Meghalaya, Tripura and Assam.

(i) Assam Himalaya

(ii) The Brahmaputra or Assam Valley

(iii) The Meghalaya Hills or Shillong plateau including he Garo, chasi, Jaintia and Mikir - It is a 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 plain 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 or Aravalli-Region deficient in rainfall. Entirely different in character from the highly plains of the Ganga and Brahmaputra.

THE INDIAN PLATEAU

Deccan Lava Region
Includes plateau area of Maharashtra and neighbouring states of M.P., A.P. and Karnataka.- Receives annual rainfall between 50cm and 100cm. Region has Black soil and produces cotton, jowar and groundnut.

The North Western Plateau and the Aravalli Range.
Situated to the north of Deccan lava region.
- Receives less rainfall during summer than the Deccan lava region and is relatively cooler in winter.

The Karnataka Plateau
Situated to the south of the Deccan lava region-Relatively cooler in summer than neighbouring areas due to its high elevation.

Telengana and Rayalseema
Situated to the East of Karnataka state – Receives less rainfall than coastal Andhra Pradesh.

The North Eastern Plateau
Situated to the east of the Deccan lava region and includes interior part of Orissa, the Jharkhand Plateau and eastern M.P.-Regions 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 Plain of Andhra Pradesh and Orissa in the North.

(ii) Tamil Nadu Region - Receives rainfall during winter also.

**Western Coastal Region**

(i) Gujarat Region North of Daman

(ii) The Konkani Region between Daman in the north and Goa in the south.- Largely semi-arid, millet and cotton producing region. Dominated by port and industries of Mumbai.

(iii) Goa and littoral of Karnataka, Kerala. – Plantation and wet crops producing region.

**INDIA- MAJOR SOIL TYPES**

**ALLUVIAL SOIL**

**DISTRIBUTION:** 7.7 lakh km² (24% of the country’s total area)

**Formation:**

Formed due to deposition of alluvium brought by rivers over millions of years. Newer alluvium is called khadar and the old alluvium is called Bhangar

Terai Soil: Bhabar infertile soil: Usar

**Characteristics:**

Very fertile soil, rich in potash and lime, deficient in humus, nitrogen and phosphorus.

**Regions&States:**
Northern plains or river basin: Punjab, Haryana, eastern part of Rajasthan, Gujarat, U.P., Bihar, West Bengal and Assam Valley.

**BLACK COTTON SOIL OR REGUR SOIL.**

**Distribution:** 5.18 lakh km² (16%)

*Formation:* Formed over Deccan lava, gneiss and granites.

**Characteristics:**

- Black in colour due to presence of Fe and Mg. Deficient in nitrogen and phosphoric acid. Rich in potash and lime.

**Regions&States:**

- It covers lateaus of Maharastra, Sourth Orissa, Northern Karnataka, Parts of Rajasthan (two districts of Bundi and Tonk) Central and South Tamil Nadu.

**RED SOIL**

**Distribution:** 5.18 lakh km² (16%)

*Formation:* The soil developed on old crystalline rock under moderate to heavy rainfall. It is in different shades of Red and Yellow.

**Characteristics:**

- Red colour due to presence of Fe. Deficient in organic plant material, phosphorus, nitrogen and lime content. Potash and alumina content are satisfactory. Acidic like laterite but less leached than laterite soil.

**Regions& States:**

- Larger part of Tamil Nadu, Andhra Pradesh and Karnataka. Southern parts of Maharashtra, Eastern Mp, parts of Orissa and Chotanagpur and Bundelkhand.

**LATERITE SOIL:**

**Distribution:** 1.26 lakh km²

*Formation:* The Laterite soil is a result of intense leaching due to heavy tropical rains with alternate wet and dry seasons.

**Characteristics:**
More acidic on higher areas due to presence of Al and Fe. Deficient in nitrogen, potash, magnesium and phosphoric acid.

**Regions & States:**

Tropical humid areas where rainfall is more than 200 cm e.g., Western Ghats, Karnataka, Tamil Nadu, Chotanagpur Plateau and slopes of North Eastern states.

**ARID OR DESERT SOIL**

**Distribution:** 1.42 lakh km$^2$

**Formation:**

Sand and wind blown. Weathering due to temperature help in the formation of these soils. Developed under arid or semiarid conditions in the north western part of the country.

**Characteristics:**

Deficient in humus and nitrogen, rich in phosphorus, Due to less leaching mineral content is high.

**Regions & States:**

Punjab, Southern parts of Haryana, Western Rajasthan and Rann of Kachchh in Gujarat.

**MOUNTAIN SOILS**

**Formation:**

Formed by the deposition or organic matter derived from the forest growth, Characteristic of soil varies with variation of rocks, ground configuration and climate.

**Characteristics:**

Rich in humus but deficient in potash, phosphorus and like. Most suitable for plantation crops like tea, coffee etc.,

**Region & states:**

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 SOIL:

Formation:
Developed in hot humid conditions as a result of accumulation of large amount of organic matter.

Characteristics:
Dark and almost black in colour, very strongly acidic and saline.

Region & States:
They are confined to depression caused by dried lakes in alluvial and coastal plain areas and developed under water logged environments. For example, Regions like Kari in Kerala, T.N., coastal Orissa, W.B. and North Bihar.

MEAN ANNUAL RAINFALL

AREA OF HEAVY RAINFALL

Rainfall between 200- 400 cm

The Arabian Sea branch of south west monsoon cause rainfall all along the western Ghats and Western coastal regions from June to September.

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.

In These regions Orographic features play an important role because the moisture laden monsoon winds strike against physical barriers the like mountains, to cause heavy rainfall.

AREA OF MODERATE RAINFALL

Rainfall between 100 – 200 cm

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.
Rain fall 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 intensity of rainfall decreases from east to west and north to south in the Northern Plains.

AREA OF SCANTY RAINFALL

Rain fall between 40 – 60 cm

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 60cm.

The dry regions of Rajasthan, west of the Aravalli hills receives rainfall below 20cm, Northern parts of Gujarat and Jammu and Kashmir are other regions which receive scanty rainfall.

AREAS OF WINTER RAINFALL

(i) The northwestern parts of India-Jammu & Kashmir, Punjab and U.P. plains.

(ii) Tamil Nadu: Rainfall due to North East monsoon.

INFORMATION ABOUT HIMALAYAN RIVERS

THE INDUS SYSTEM(INDUS AND ITS TRIBUTOARIES)

1.INDUS:

(One of the world’s largest river)

Source: Tibet, at an altitude of 5,180 m near Mansarover Lake.

Total length: 2,880km (709km in India)

River Basin: 1,165,00 sq.km (321,290 sq.km in India)

Information:

Mountain tributaries; Gilgit Shyok, Skardu, Shigoo.

Plain tributaries: Jhelum, Chenab, Ravi, Sutlej and Beas.

2.JHELUM:
(An important river of Kashmir and is the main waterway)

Source: Rises in Verinag at the foothills of Pirpranjal.

Total length: 400 km

River Basin: 28,490 sq.km (in India)

Information:
- Its basin lies between Great Himalaya and Pir Pranjal Range.
- It flows through Vale of Kashmir and Wular Lake before entering into Pakistan.

3. CHENAB
(largest of all the Indus tributaries)

Source: Rises in snow covered Kullu hills of Himachal Pradesh.

Total length: 1,800 (in India)

River Basin: 26,755 sq.km (in India)

Information:
- Flows through Chamba state for 160 km in the trough between the Greater Himalaya and the Pir Panjal.

4. RAVI

Source: Kullu hills of H.P

Total Length: 725 km

River Basin: 5,957 (in India)

5. SUTLEJ
(Second largest tributary of Indus)

Source: Rakas Lake, at an altitude of 4,555 m in Tibet

Total Length: 1050km (in India)

River Basin: 25,087 sq.km (in India)

Information:
- It enters India through Shipki La and flows through Himachal Pradesh and Punjab before entering into Pakistan.

6. BEAS
THE GANGA SYSTEM (GANGA AND ITS TRIBUTARIES)

The Ganga:

Formed by two head streams Alaknada and Bhagirathi which join at Devprayag.

Source: Rises in Gangotri glacier of the Great Himalaya. Above Devaprayag it is called as Bhagirathi and below it is referred to as the Ganga.

Total Length: Of its total length of 2,525 k.m, 1,450 k.m in Bihar and 520 km in West Bengal.

River Basin: 838,200 sq.km. Largest river basin in India, Covers more than fourth of the country’s total surface

Information:

Left Bank tributaries; Ramganga, Gomati, Ghagra, Gandak, Burhi Gandak, Kosi. Right Bank tributaries; Yamuna, Son. The Bhagirathi – Hooghly is the western most distributary of the river. Beyond Frakka it bifurcates itself into Bhagirathi Hooghly in West Bengal and Padma-Meghna in Bangladesh.

The Yamuna (Largest and the most important tributary of Gang)

Source: Rises in the Yamunotri glacier which is west of Ganga source.

Total Length: 1,376 km from its source to Allahabad where it joins Ganga.

River Basin: 3,59,000 sq. km

Information: Important tributaries; Chamba (rises in Mhow in the Vindhya)Sidh. Betwa and Ken.

The Son

(Right bank tributary of Ganga)

Source: Rises from the Amarkantak Plateau

Total Length: 780 km
**River Basin:** 71,900 sq.km  
**Information:** It joins Ganga near Ramnagar.  

**Ramganga:**  
**Source:** Rises in the Kumaun Himalaya near Nanital  
**Total Length:** 690 km  
**River Basin:** 32,800 sq.km  
**Information:** It joins the left bank of Ganga near Chapra (Bihar).  

**Ghagra:**  
**Source:** Rises from east of Gangotri,  
**Total Length:** 1,080 km  
**River’s Basin:** 127,500 sq.km More than half of its basin is in Nepal.  
**Information:** It joins the left bank of Ganga near Chapra (Bihar).  

**Gandak:**  
**Source:** Rises near the Nepal-China border at an altitude of 7,600m in the Central Himalaya.  
**Total Length:** 425 km (in India)  
**River Basin:** 48,500, 9,500 sq.km (in India)  
**Information:** It flows through eastern Nepal, enters Bihar in Champaran district and turn south east to join the left bank of Ganga near Sonepur.  

**Kosi**  
(formed by the confluence of the Son Kosi, the Arun Kosi and the Tamur Kosi)  
**Source:** Rises from the peak of Nepal, Tibet and Sikkim  
**Total Length:** 730km (in India)  
**River’s Basin:** 86,900, 21,500 sq.km (in India)  
**Information:** It flows through eastern Nepal, enters Bihar in Saharasa 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 as the ‘**Sorrow of Bihar.**’  

**Damodar**
(Sorrow of Bengal)

**Source:** Rises in Chota Nagpur plateau in the Plalamau district (Jharkand)

**Total Length:** 541 km

**River’s Basin:** 22,000 sq.km

**Information:** It joins the Bhagirathi Hooghly in West Bengal

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**THE BRAHMAPUTRA SYSTEM**

**(BRAHMAPUTRA AND ITS TRIBUTARIES)**

**Brahmaputra or Tsangpo (Tibet)**

**Source:** Rises in the Chemayungdung glacier in the Kailash Range and Mariam La pass separates it from Mansarovar Lake.

**Total Length:** 2,900 km one of the longest rivers of the world.

**River’s Basin:** 240,000 sq.km

**Information:** Important tributaries: Subansiri Kameng, Dhansiri, Dilhang, Lohit, Tista, Torsa. Manas; Burhi Dihing, etc. It flows through Tibet, India and Bangladesh and forms the large delta of the world along with Ganga.

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**PENINSULAR RIVERS**

**Mahanadi**

(An important river of the peninsular India)

**Source:** Northern foothills of Dandakarnaya near Shiawa in Raipur district.

**Length:** 857km

**River’s Basin:** 141,600 sq.km in M.P., Orissa, Bihar and Maharashtra

**Information:** Left bank tributaries; Sheonath, Hasdeo, Ib and Mand. Right bank tributaries ; tel, Ong, and Jonk.

**Subarnarekha, Brahmi and Baitarni:**

**Information:**

These smaller river basins are interposed between the Ganga and the Mahanadai basin.
THE GODAVARI RIVER SYSTEM
(GODAVARI AND ITS TRIBUTARIES)

Godavari:
Source: Trimbak plateau of north Sahyadri near Nasik (Maharashtra)
Length: 1465 (longest river of Peninsular India)
River’s Basin: 312,812 half of which lies in Maharashtra and also in Andhra Pradesh , M.P., Orissa, and Karnataka.
Information: 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 tributaries: Manjra.

KRISHNA RIVER SYSTEM
(KRISHNA AND ITS TRIBUTARIES)

Krishna
(Second largest east flowing river of the Peninsula)
Source: North of Mahabaleshwar in the Western Ghats.
Length: Flows for a distance of 1,400 km to the Bay of Bengal
River’s Basin: 258,948 sq.km. Lies in Karnataka, Andhra Pradesh and Maharashtra.
Information: Important tributaries: Bhima, Tungabhadra, Ghatprbha, Malaprabha, Musi and Koyna.

Kaveri
Source: Rises in the Brahmgiri Range of Western Ghats.
Length: 800km
River’s Basin: 87,900 sq.km.- Shared by Kerala, Karnataka, and Tamil Nadu.
Information: Left bank tributaries: Herangi, Hemavati, Shimsha, Arkavati, etc.
Right bank tributaries: Kabani, Bhavani and Amravati etc.

WEST FLOWING RIVER
Sabarmati:
Source: Mewar hills in Aravalli Range.
Length: 320km
River’s Basin: 21,674 sq. km. Shared by Rajasthan and Gujarat.
Information: Important tributaries: Hathmati, Sedhi, Wakul, etc.

Mahi
Source: Vindhya Range at an altitude of 500 m.
Length: 533km
River’s Basin: 34,862 sq. km
Information: Madhya Pradesh, Rajasthan and Gujarat share the river basin.

Narmada
(Largest west flowing Peninsular river)
Source: Rises in Amarkantak in Madhya Pradesh.
Length: 1312 km (from its source to its estuary in the Gulf of Khambhat)
River’s Basin: 98,796 sq. km which it shared by M.P. Gujarat and Maharashtra.
Information: Left bank tributaries: Tawa Burhner, etc. Right Bank tributaries: Hiran
world’s famous Dhuan Dhar or Cloud of Mist Falls is located on this river. It flows through a rift valley between the Vidhyas and the Satpura Range.

Tapi or Tapi
(Second largest of west flowing river of Peninsula)
Source: Rises near Multai on the Satpura Range in Betul district (M.P)
Length: 740 km
River’s Basin: 65,145 sq. km in M.p., Maharashtra and Gujarat
Information: Left bank tributaries: Purna, Veghar, Girna, Bari and the Punjhar
Right Bank tributaries: Betul, Arunavati, Ganjal and Gomai. It is also Known as
the ‘twin’ or handmaid of the Narmada.
RIVER VALLEY PROJECTS

Bhakra Nangal Multipurpose Project.
Bhakra dam: One of highest gravity dam in the world.
Govind Sagar Lake (H.P) is a reservoir.
River: Sutlej(A tributary of Indus)
State: Joint venture of Punjab, Haryana and Rajasthan
Purpose: Irrigation, Hydro electricity.

Thein Dam Project:
River: Ravi (A tributary of Indus)
State: Punjab
Purpose: Irrigation, hydroelectricity

Dulhasti project:
River: Chenab (A tributary of Indus)
State: Jammu and Kashmir
Purpose: Part of the programme of cascade development for irrigation

Salal project:
River: Chenab
State: Jammu and Kashmir
Purpose: Irrigation

Beas project:
River: Beas (A tributary of Indus)
State: Joint venture of Punjab, Haryana and Rajasthan
Purpose: Hydro electricity

Sharda Sahayak Project:
River: Ghagra (left bank tributary of Ganga)
State: Uttar Pradesh
Purpose: Irrigation

Ramganga multipurpose project
River: Chuisot stream near Kalabagh  
State: Uttar Pradesh  
Purpose: Irrigation, hydroelectricity

**Banasagar project**
River: Son  
State: M.P., Bihar and U.p.,  
Purpose: Irrigation  
Rihand scheme Reservoir: Govind Ballabh Sagar (U.P)

River: Rihand  
State: Uttar Pradesh  
Purpose: Hydroelectricity for the development of south eastern industrial region of U.P.

**Damodar Valley multipurpose project**
Four dams: Tilaiya and Maithon (on the Barakar River), konar (konar River) and Panchet (Damodar River)
River: Damodar  
State: West Bengal(also shared by Jharkhand)  
Purpose: Flood control, Irrigation, Hydroelectricity.

**Mayr kashi project**
River: Mayrkashi  
State: West Bengal (also shared by Jharkhand)  
Purpose: Flood control, Irrigation, Hydroelectricity.

**Mayur Kashi project**
River: Mayrkashi  
State: West Bengal  
Purpose: Irrigation, Hydroelectricity

**Hirakud multipurpose project (world’s longest main stream dam)**
River: Mahanadi  
State: Orissa
Purpose: Irrigation, Hydroelectricity

**Poochampad Project**
River: Godavari
State: Andhra Pradesh
Purpose: Irrigation

**Jaykawadi Project**:
River: Godavari
State: Maharashtra
Purpose: Irrigation

Nagarjuna Sagar
River: Krishna
State: Andhra Pradesh
Purpose: Irrigation, Hydroelectricity

**Upper Krishna Project**
River: Krishna
State: Andhra Pradesh
Purpose: Irrigation

**Tunghbhadra multipurpose project**
River: Tungbhadra (A tributary of Krishna)
State: Joint venture of Andhra Pradesh and Karnataka
Purpose: Irrigation, Hydroelectricity.

**Ghat Prabha project**
River: Ghatprabha (A tributary of Krishna)
State: Andhra Pradesh and Karnataka
Purpose: Irrigation

**Malprabha project**:
River: Malprobha (A tributary of Krishna)
State: Karnataka
Purpose: Irrigation
Bhima project:
River: Bhima
State: Maharashtra
Purpose: Irrigation

Mettur projects
River: Kavery
State: Tamil Nadu
Purpose: Hydroelectricity
Shivasamudram Scheme on Cauvery Falls
River: kavery
State: Karnataka
Purpose: Hydroelectricity

Kundah project:
River: Kundah
State: Tamil Nadu
Purpose: Hydroelectricity

Sharavati project (near Jog falls)
River: Sharavati
State: Karnataka
Purpose: Hydroelectricity

Chambal project: (Gandhi Sagar Dam M.P), Rana Pratap Sagar and Jawahar Sagar Dam or Kota Dam
River: Chambal (a tributary of Yamuna)
State: Rajasthan, Madhya Pradesh
Purpose: Irrigation, Hydroelectricity

Kakrapara Project
River: Tapi
State: Gujarat
Purpose: Irrigation
Ukai project
River: Tapi
State: Gujarat
Purpose: Irrigation

Sardar Sarovar Project
River: Narmada
State: Gujarat, M.P., Rajasthan, Maharashtra
Purpose: Irrigation, Hydroelectricity

Tawa project:
River: Tawa (A tributary of Narmada)
State: Madhya Pradesh
Purpose: Irrigation

Mahi project (Jamnalal Bajaj Sagar)
River: Mahi
State: Gujarat
Purpose: Irrigation

Matatila project:
River: Betwa
State: Uttar Pradesh, Madhya Pradesh,
Purpose: Irrigation, Hydroelectricity.

FOOD CROPS DISTRIBUTION

RICE (KHARIF CROP)

Conditions Required

Temperature: not below 21°C
Rainfall: More than 125cm
Soil: Clayey loam best suited

Distribution (in order of Production)

1. West Bengal
2. U P
3. Andhra Pradesh
4. Punjab
5. Tamil Nadu
6. MP
7. Orissa
8. Bihar
9. Assam
10. Karnataka
11. Maharashtra
12. Haryana
13. Kerala

WHEAT (RABI CROP)

Conditions Required

**Temperature:** 10 – 15° C (winder) 21° - 26° C (Summer)

**Rainfall:** 75cm -100cm (moderate)

**Soil:** Well drained fertile, friable loams, and clay loams

**Distribution (In order of Production)**

1. Uttar Pradesh
2. Punjab
3. Haryana
4. Madhya Pradesh
5. Rajasthan
6. Bihar
7. Gujarat
8. Maharashtra

MILLETS

BAJRA
Condition Required
Temperature: 25° - 30° C
Rainfall: 40 – 50cm
Soil: Poor light sandy soils, black and red soils
Distribution (in order of Production)
   1. Rajasthan
   2. Maharashtra
   3. Gujarat
   4. Uttar Pradesh
   5. Haryana

BARLEY
Condition Required
Temperature: 10 - 15° C
Rainfall: 75 cm to 100cm
Soil: Light clay and alluvial soil
Distribution (In order of production)
   1. Uttar Pradesh
   2. Rajasthan
   3. Madhya Pradesh
   4. Haryana
   5. Punjab
   6. Bihar
   7. Himachal Pradesh
   8. West Bengal

CASH CROPS

COTTON
Conditions Required
   Kharif crop of tropical and subtropical areas.
**Temperature**: 21º - 30º C but not below 21º C.

210 frost free days.

**Rainfall**: 50 – 100cm or irrigation facility.

**Soil**: Deep black soil (regur), even grows in alluvial soils and laterite soils.

**Distribution (In order of Production)**

1. Punjab
2. Maharashtra
3. Gujarat
4. Haryana
5. Andhra Pradesh
6. Rajasthan
7. Karnataka
8. Tamil Nadu
9. Madhya Pradesh

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**JUTE**

**Condition Required**

Second important fibre crop of India, crop of hot and humid climate.

**Temperature**: 24º - 35º C

**Rainfall**: heavy rainfall of 120 – 150 cm with 80 – 90 percent of relative humidity.

**Soil**: light sandy or clayey loams.

**Distribution (In order of Production)**

1. West Bengal (70 percent of the production, over 60 percent of the area)
2. Bihar
3. Assam
4. Orissa

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**SUGAR CANE**
**Temperature:** 21° - 27° C  
**Rainfall:** 70 – 150 cm or irrigation facilities with high humidity.  
**Soil:** tolerate any type of soil that can retain moisture.  
**Distribution (In order of Production)**  
1. Uttar Pradesh  
2. Maharashtra  
3. Tamil Nadu (highest yield/hectare)  
4. Karnataka  
5. Andhra Pradesh  
6. Gujarat  
7. Bihar  
8. Haryana  
9. Punjab  
10. Orissa  

**TOBACCO**  
**Condition Required**  
Plant of tropical and subtropical climates and frost is harmful  
**Temperature:** 16° - 35° C  
**Rainfall:** 50 – 100 cm or irrigation facilities  
**Soil:** Well- drained friable loam  
**Distribution (In order of Production)**  
1. Gujarat (90 percent of Tobacco from Vadodara and Kheda districts).  
2. Andhra Pradesh (West and East Godavari, Prakasham, Kurnool and Nellore are the main producing districts) Other areas of minor production (a) Uttar Pradesh (b) Karnataka (c) West Bengal.  

**PLANTATION CROPS**  
**TEA**  
**Condition Required**
Tropical and subtropical plant, which thrives well in hot and humid climate.

**Temperature:** 20° - 30° C  
**Rainfall:** 150 – 300cm (well distributed)  
**Soil:** forest soil rich in humus and iron content is the best suited.

**Distribution (In order of Production)**
1. Assam (the Brahmaputra valley, Soorma valley)  
2. West Bengal (the Duars, Darjeeling)  
3. Tamil Nadu (highest yield per hectare)  
4. Kerala (Kottayam, Kollam and Tiruvananthapuram district).

Other areas of minor production
(a) Tripura  
(b) Karnataka  
(c) Uttar Pradesh  
(d) Himachal Pradesh (Kangra valley)

**COFFEE**

Condition Required
Crops of hot and humid climate  
**Temperature:** 15° - 28° C but does not tolerate frost.  
**Rainfall:** 150 – 250cm  
**Soil:** well drained rich friable loams with rich in humus, iron and calcium.

**Distribution (In order of Production)**
1. Karnataka (80 percent of total coffee production)  
2. Kerala (13 percent of total production)  
3. Tamil Nadu

**RUBBER**

Condition Required  
**Temperature:** 25° - 35° C
Rainfall: about 300 cm (well distributed throughout the year)

Soil: well drained loamy soil of hilly region.

Distribution (In order of Production)

1. Kerala (above 90 percent of total production, Kottayam, Ernakulum, Kozhikode and Kollan are the main producing districts)
2. Tamil Nadu
3. Karnataka

OTHER CROPS

MAIZE

Condition Required

Rainfall Kharif Crops

Temperature: 21° - 27° C

Rainfall: 50 – 100 cm

Soil: well drained alluvial, or red loams

Distribution (In order of production)

1. Bihar
2. Uttar Pradesh
3. Karnataka
4. Andhra Pradesh
5. Madhya Pradesh
6. Rajasthan
7. Himachal Pradesh

JOWAR

Conditions Required

Both Kharif and Robi crops

Temperature: 26° - 33° C for kharif crops and not below 16°C for rabi crops

Rainfall: >30 cm but <100 cm; rainfed crop in dry farming areas
Soil: Variety of soil including clayey, sandy

Distribution (In order of Production)
1. Maharashtra
2. Karnataka
3. Madhya Pradesh
4. Andhra Pradesh
5. Tamil Nadu
6. Uttar Pradesh
7. Rajasthan
8. Gujarat

RAGI

Conditions Required
Temperature: 20º - 30º C
Soil: red, light black and sandy loams

Distribution (In order of Production)
1. Karnataka
2. Tamil Nadu
3. Maharashtra
4. Uttar Pradesh
5. Andhra Pradesh

GRAM

Conditions Required
Most important of all pulses
Temperature: 20º - 25º C
Rainfall: 40 – 45cm
Soil: Grows well in loamy soil

Distribution (In order of Production)
1. Madhya Pradesh
2. Uttar Pradesh  
3. Rajasthan  
4. Haryana  
5. Maharashtra (These five states produce over 90 percent gram of India)

NON METALLIC MINERALS

MICA, ASBESTOS, GYPSUM, LIMESTONE, DOLOMITE, ATOMIC MINERALS DIOMAND

MICA:

(Abhrak) valuable mineral in electrical and electronic industry.

**Distribution:** Bihar – Gaya, Hazaribagh (now in Jharkhand), (Largest mica producing state of India)  
Andhra Pradesh – Nellore.  
Rajasthan – Ajmer, Bewar, Tonk, Bhilwara, Udaipur, and Banswara.

LIME STONE:

75% used in cement industry 16% in irons and steel industry. 4% in chemical industry.

**Distribution:**  
Madhya Pradesh- Satna, Jabalpur, Betul, Sagar and Rewa.  
Chhattisgarh – Bilaspur, Raigarh, Raipur and Durg.  
Andhra Pradesh-Adilabad, Warangal, Nalgonda, Mohboobnagar, Guntur  
Karnataka – Bijapur, Gulbarga, Shimoga (cement grade limestone)  
Rajasthan – Jhunjhunu, Bikaner, Nagaur, Jodhpur, Pali, Sirohi, Udaipur  
Chittorgarh, Ajmer, Sawai Madhopur, Bundi, Banswara.  
Gujarat – Banaskantha, Amreli Junagadh, Surat, Kachchh, Kheda and Panchmahals.

DOLOMITE:

**Distribution:**  
Bihar –Rohtas
Jharkhand – Chaibasa in Sighbhum district and Palamau district.
Orissa (largest produces)-Sundargarh, Sambalpur, and Koraput districts
Madhya Pradesh – Chhindwara, Jhabua, Jabalpur, Balaghat,
Chhattisgarh – Bilaspur, Durg and Bastar district.
Gujarat – Bhavnagar and Vadodara district.

ASBESTOS:
Used for making fire proof cloth, rope, paper, paint, etc. and also
asbestos cement products like sheets etc.

Distribution:
Rajasthan – Alwar, Ajmer, Pali, Udaipur and Dungarpur districts,
Andhra Pradesh – Cuddapah district.
Karnataka – Shimoga, Chickmagalur, Hassan, Mandya and Mysore districts.

GYPSUM:
Mainly used in making of ammonia sulphate fertilizer in cement industry and in
making plaster of paris, etc.

Distribution:
Rajasthan – (largest producer of gypsum in India): Churu, Ganganagar, Bikaner,
Jaisalmer, Nagaur and Pali districts produce 95 percent of the total gypsum of
India.
Jammu and Kashmir – Baramula and Doda districts.
Tamil Nadu – Tiruchirapalli

DIAMON:

Distribution:
Madhya Pradesh – Panna
Andhra Pradesh – Anantpur, Kurnoot
Marnataka – Bellary.

ATOMIC MINERALS
(URANIUM, THORIUM)
URANIUM:
Distribution:
Bihar – Gaya
Jharkhand – Hazaribagh and Singhbhum.
Uttar Pradesh – Saharanpur
Rajasthan – Udaipur.
Kerala – Uranium from monazile sand of coastal regions.

THORIUM:
Distribution:
Bihar, Tamil Nadu, Kerala and Rajasthan.

METALLIC MINERALS
(IRON, BUXITE, COPPER, LEAD/ZINC, MANGNESE, MAGNESIUM, GOLD.)
IRON:
Distribution:
Jharkhand: Singhbhum (Noamundi, Sindurpur, Kiriburu)
Orissa – Mayurbhanj( Gurumahisani., Badampahar, Sulaiput), Keonjhar
Madhya Pradesh – Jabalpur, Balaghat
Chhatisgarh – Durg (Dalli Rajara), Bastar (Bailadila)
Andhra Pradesh – Guntur, Kurnool
Tamil Nadu – Salem, Tiruchirapalli
Maharashtra – Surajgarh, Lohra-Piplagaon Ratnagir.
Kerala – Kozhikode

BAUXITE:
Distribution: Jharkhand – Palamanu, Ranchi
Madhya Pradesh – Katni, Amarkantak, Maikata Range.
Chhattisgarh – Sarguja, Raigarh and Bilaspur.
Orissa – Kalahandi, Koraput
Tamil Nadu – Salem, Nilgiri, Coimbatore and Madurai.
Gujarat – Sabarkantha, Jamnagar, Surat.
Maharashtra – Kalaba, Ratnagiri, Kolhapur.
Karnataka – Belgaum.

**COPPER**

**Distribution:**
Jharkhand – Hazaribagh, Singhbhum.
Madhya Pradesh – Balaghat (Malanjkhand belt)
Andhra Pradesh – Khammam, Guntur and Kurnool
Rajasthan – Jhunjhunu, Khetri, Alwar, Bhilwara and Udaipur.
Maharashtra – Chandrapur
Karnataka – Chitradurga, Hassan.

**LEAD AND ZINC:**

**Distribution:**
Sikkim, Meghalaya, Andhra Pradesh (Cuddapah)
Rajasthan- Zawar(Udaipur) Aguncha – Rampura (Bhilwara)
Gujarat _ Banaskantha, Panchmahal, Vadodra, Surat.

**LIGNITE COAL:**

**Distribution:**
Tamil Nadu – Neyveli
Jammua and Kashmir, Rajasthan (Palana in Bikaner dist.)
Gujarat (Umrasar)

**TERTIARY COAL FIELD:**

**Distribution:**
Assam – Makum (Sibsagar), Najtra, Janji
Meghalaya, Arunachal Pradesh(Namchik, Namphuk)

**OIL FIELDS:**

**Distribution:**
Assam – Digboi, Naharkatia, Moran, and Sibsagar.
Gujarat – Mehsana, Cholka, Kalol, Nawagam, Ankaleshwar and Kosamba

OFF SHORE OIL FIELDS

Distribution:
1. Mumbai High
2. Bassein
3. Ravva
4. Aliabet

OIL REFINERIES:

Distribution:
Assam – Digboi (IOC), Guwahati (IOC), Bongaigaon
Bihar – Barauni (IOC)
Uttar Pradesh – Mathura
Gujarat – Koyali, Jamnagar (largest oil refineries)
Maharashtra – Mumbai (BPCL)
Karnataka – Mangalore (MRPL)
Kerala – Kochi (CRI)
West Bengal – Haldia (IOC)
Andhra Pradesh – Vishakhapatnam (HPCL)
Tamil Nadu – Chennai (MRI)

IMPORTANT INDUSTRIES OF INDIA

COTTON TEXTILE INDUSTRY:
The oldest and the largest organized modern industry of India.

MANUFACTURING CENTRES:

Maharashtra (122 mills)
- Mumbai (63 mills), largest centre,
- Other centre: Nagpur, Amaravati, Wardha, Jalgaon, Aurangabad, Pune,
  Satara, Scholapur, and Kolhapur.
Gujarat (118 mills)
- Ahmedabad (73 mills), Second largest centre after Mumbai
- Other centres: Porbandar, Rajkot, Vadodra, Surat.

Madhya Pradesh:
- Bhopal, Indore, Dewas, Ujjain, Ratlam, Gwalior, Jabalpur, etc

Tamil Nadu
- Coimbatore. (Most important centre). Other centres – Chennai, Perambur, Salem, Tirchirapalli, Madurai, Tirunelveli, Tuticorin, etc

West Bengal
- Kolkata (Most important entre).
- Other centre: Howrah, Serampur, Murshidabad, etc.

Uttar Pradesh
- Kanpur (largest centre). Other centres: Varanasi, Mirzapur, Lucknow, Agra, Modinagar, Saharanput, etc.

Rajasthan
- Jaipur, Pali, Bhilwar, Kota, Udaipur, Ganganagar.

Karnataka
- Bangalore, Mysore, Mangalore, Chitradurga, Belgaum.

Orissa
- Cuttack

Punjab
- Amritsar, Dhariwal, Phagwara, Ludhiana.

Kerala
- Thiruvananthapuram, Alleppey

Bihar
- Patna, Gaya, Bhagalpur.

Andhra Pradesh
- Hyderabad, Secundarabad, Rajahmundry, East Godavari and Udayagiri.
JUTE TEXTILE INDUSTRY

- First large scale industry was established in 1855 at Rishra, (near Serampur) in Bengal.
- This industry suffered a great setback because of partition in 1947 because 80 percent of Jute producing area went to Bangladesh while all Jute mills remained in India.

MANUFACTURING CENTRES

West Bengal (56 mills)
- Kolkata (Calcutta)
- Other centres: Rishra, Serampore, Titagarh etc. mainly along the both banks of Hooghli river.

ANDHRA PRADESH
- Vishakapatna, Eluru, Guntur and Ongole.
- Other important states:

UTTAR PRADESH
- Kanpur, Gorakhpur and Shahjawan.

BIHAR
- Darbhanga, Samastipur, Purnea, Katihar and Gaya

CHHATTISGARH
- Raigarh

ORISSA
- Cuttack

WOOLLEN TEXTILE INDUSTRY

- One of the oldest textile Industries of India

MANUFACTURING CENTRES

PUNJAB (257 mills)
• Dhari (largest centre).
• Other centres: Amristsar, Ludhianan and Patiala

MAHARASHTRA (31 mills)
• Mumbai (industry based on imported wool)
• Other centres: Jalgaon, Ambernath.

UTTAR PRADESH
• Kanpur (Largest Woollen Textile centre in the state)
• Other centres: Modinagar, Allahabad, Varanai and Mirzapur.

GUJARAT
• Jamnagar, Kalol, Vadodara.

Other important states:
Karnataka : Bangalore, Bellary  Tamil Nadu: Chennai, Salem
Jammu and Kashmir: Srinagar  Himachal Pradesh: Kullu
West Bengal: Kokata.

SILK & SYNTHETIC FIBRE INDUSTRY
MANUFACTURING CENTRES
Karnataka: Bangalore, Kolar, and Mysore
West Bengal: Murshidabad, Bankura, 24 Parganas and Birbhum district
Jammu and Kashmir: Srinagar (big centre);
Other Centres: Baramula, Anantnag, Udhampur, Jammu

Other important states:
Bihar: Bhagalpur (famous for silk industry), Patna, Gaya.
Jharkhand: Palamu, Hazaribagh.
Madhya Pradesh: Birlanagar, Viragram and Indore.
Uttar Pradesh: Varanasi

CHEMICAL INDUSTRIES:
Fourth largest set of industries after textiles, iron and steel and engineering industries.

Products of chemical industry are more multifarious than of nay other industries of equal importance.

**HEAVY INORGANIC CHEMICALS**

**Alkali Chemicals:**

**Caustic Soda**

Widely used to manufacture paper, textile, soaps and detergents and alumina.

**Manufacturing Centres**

- **West Bengal:** Kolkata, Titagarh
- **Gujarat:** Porbandar, Mithapur
- **Maharashtra:** Thane, Nepa paper mills in Nagpur

**Soda Ash**

Sodium Chloride and Limestone mainly used in the manufacture of soap, paper, textile, glass, detergents and refined petroleum.

**Manufacturing Centres:**

- **Gujarat:** Mithapur, Okha
- **Uttar Pradesh:** Varanasi
- **Punjab:** Nangal
- **Tamil Nadu:** Tuticorin

**Acids**

Sulphuric Acid:

Used for manufacturing synthetic fibre, fertilizer, plastics, paints and dyestuffs.

Nitric Acid:

Bulk of production from fertilizer factory.

**Manufacturing Centres:**

- **Rajasthan:** Hindustran Zinc, Debari, Hindustan Copper, Khetri
- **Maharashtra:** Mumbai, FCI in Trombay (largest producer)
- **Tamil Nadu:** Chennai
- **Jharkhand:** Jamshedpur
- **Kerala:** Alwaye
- **West Bengal:** Kolkata, Delhi

**ORGANIC CHEMICALS**
Petrochemical Industry:

Raw materials derived from petrochemical resources and industries are concentrated near petroleum and coal fields region. Used to produce petroleum byproducts like synthetic fibres, plastics and rubber.

Manufacturing centres:

Trombay: UnionCarbide India Ltd. (First petrochemical industry)
Koyali: Udex plant
Bongaigon: Second public sector enterprises.