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# GEOGRAPHY

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## PAPER – 2 || VOLUME – 4

SIERRA INNOVATIONS

# Index

## UNIT – X

## Geography of India

# UNIT – X

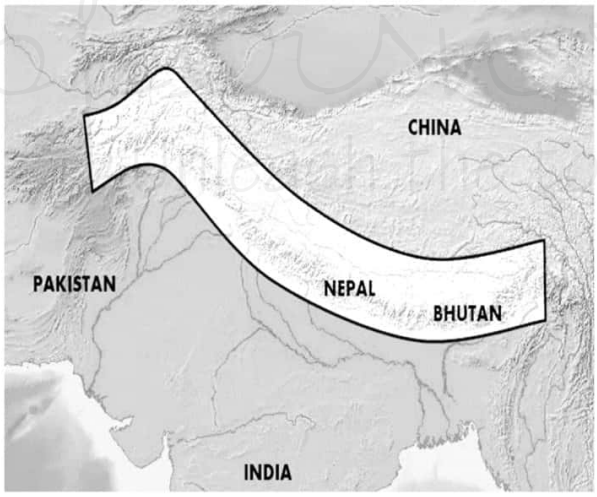
# #Major Physiographic Regions and their Characteristics

## The major physiographic divisions of India: -

1. The Himalayan Mountains
2. The Northern Great Plains
3. The Peninsular Plateau
4. The Indian Desert
5. The Coastal Plains
6. The Islands

## THE HIMALAYAS

The Indian Himalayas extend from the eastern boundary of Pakistan to the border of Myanmar for about 2500 km with a varying width of about 500 km in the west and about 320 km in the east. They lies to the north of the GangaBrahmaputra Plains and are separated from the plains by the Himalayan Front Fault (HFF). They include parts of Jammu and Kashmir, Himachal Pradesh, Uttarakhand, Nepal, Sikkim, Bhutan and Arunachal Pradesh. Their offshoots run in a north-south direction along the India-Myanmar boundary through Nagaland, Manipur, and Mizoram.




## Origin of the Himalayas

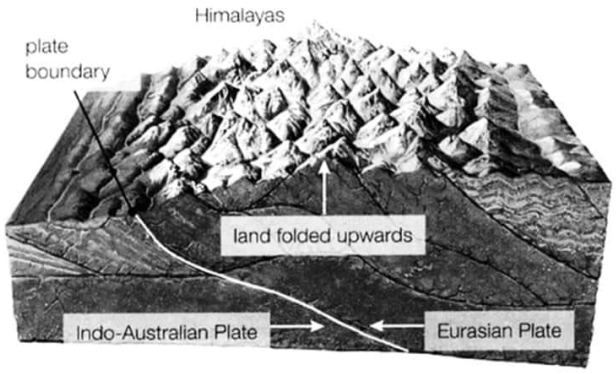
The origin of the Himalayas has been a point of contention among the geologists and geomorphologists. It is a complex mountain system having rocks from the Precambrian and Eocene periods. Mostly formed of sedimentary and metamorphic rocks, it has been subjected to intense folding and faulting. The main theories about the origin of the Himalayas are as under:

1. The Geosynclinal Origin
2. The Pate Tectonic Origin of the Himalayas

1. The Geosynclinal Origin: The main supporters of the geosynclinal origin of the Himalayas are Argand, Kober, and Suess. According to these geologists, the disintegration of Pangaea, about 200 million years back, led to the formation of a long Tethys Sea between the Lauratian Shield (Angaraland) of the north and the Gondwana land of the south. This sea was occupying the region of Himalayas during the Mesozoic Era (180 million years ago). At the end of the Palaeozoic and beginning of the Mesozoic Eras, the Tethys almost girdled the whole Earth running from Europe in the west to China in the east. Eroded material from the two land masses (Eurasian Shield—Angaraland and Gondwana land) was deposited in the Tethys Sea and assumed considerable thickness due to the sinking nature of the sea bed.

   During the Cretaceous Period, the bed of the sea started rising which led to the folding of three successive ranges of the Himalayas. The first upheaval led to the formation of the Greater Himalayas during the Eocene Period (about 65 million year back). Similarly, the second upheaval took place during the Miocene Period (about 45 million years back) resulting in the formation of the Lesser Himalayas, and the third upheaval started in the Pliocene period (about 1.4 million years back) resulting in the formation of the Shiwaliks or the Outer Himalayas.

2. The Plate Tectonic Origin of the Himalayas: The theory of Plate Tectonics was put forward by W.J. Morgan of Princeton University in 1967. This theory is based on the concept of "Sea-Floor Spreading" advocated by H.H. Hess. According to this theory, about 70 or 65 million years ago there was an extensive geosyncline, called the Tethys, in place of the Himalayas. About 65-30 million years ago the Indian plate came very close to the Asian plate and started subducting under the Asian plate.



## Physiographic Divisions of the Himalayas

For a systematic study of the physiography and relief, the Himalayas may be divided into the following four divisions from north to south:

1. The Trans-Himalayas;
2. The Greater Himalayas;
3. The Lesser Himalayas;
4. The Shiwaliks or the Outer Himalayas.

1. The Trans-Himalayas: The Trans-Himalayas are about 40 km wide. The rocks of this region contain fossils bearing marine sediments which are underlain by "Tertiary granite". It has partly metamorphosed sediments and constitutes the core of the Himalayan axis. It has a great accumulation of debris in the valleys of defeated streams which could not maintain their southerly course across the rising barrier of the Himalayas.
2. The Greater Himalayas: The Greater Himalayas rise abruptly like a wall north of the Lesser Himalayas. The Greater Himalayas are about 25 km wide with an average height above 6100 m. Almost all the lofty peaks of the Himalayas, Mt. Everest, Kanchanjunga, Nanga-Parbat, Gasherbrum, Manaslu, Dhaulagiri, Annapurna, Gosainthan, Cho-Cyu, Nanda Devi, Kamet, Badrinath, etc. lie in this zone. The Greater Himalayas are composed of crystalline, igneous or metamorphic rocks (granite, schists and geneiss). The basal complex of the Himalayas is Archaean. At places, due to heavy thrust, older rocks are found overlying the newer rocks. The Greater Himalayas are almost a contiguous range. The range has very few gaps mainly provided by the antecedent rivers. The Greater Himalayas receive less rainfall as compared to the Lesser Himalayas and the Shiwaliks. Physical weathering is pronounced. Erosion is, however, less effective over the Greater Himalayas as compared to the Lesser Himalayas. Being lofty, they have very little forest area.
3. The Lesser Himalayas: The width of the Lesser Himalayas is about 80 km with an average height of 1300- 4600m. It consists, generally, of unfossiliferous sediments or metamorphosed crystalline. The main rocks are slate, sandstone and quartzites. This region is subjected to extensive erosion due to heavy rainfall, deforestation, and urbanisation.
4. Siwalik Range, also called Siwalik Hills or Outer Himalayas, Siwalik also spelled Shivalik, sub-Himalayan range of the northern Indian subcontinent. It extends west-north westward for more than 1,000 miles (1,600 km) from the Tista River in Sikkim state, north-eastern India, through Nepal, across north-western India, and into northern Pakistan. Though only 10 miles (16 km) wide in places, the range has an average elevation of 3,000 to 4,000 feet (900 to 1,200 metres). It rises abruptly from the plain of the Indus and Ganges (Ganga) rivers (south) and parallels the main range of the Himalayas (north), from which

it is separated by valleys. The Siwaliks are sometimes considered to include the southern foothills of the Assam Himalayas, which extend eastward for 400 miles (640 km) across southern Bhutan to the bend of the Brahmaputra River. The range proper, to which the name Siwalik (from Sanskrit, meaning "Belonging to [the God] Shiva") was formerly restricted, is the 200 miles (320 km) of foothills in India extending from the Ganges River at Haridwar, Uttarakhand state, north-westward to the Beas River.

## Longitudinal Divisions of the Himalayas

The Himalayas have also been divided by Sir Sydeny Burrard into four divisions, namely:

1. The Western Himalayas,
2. The Kumaun Himalayas,
3. The Nepal Himalayas,
4. The Assam Himalayas.

Prof. S.P. Chatterjee (1,964) divided the Himalayan region into three meso physiographic regions. Their names are

1. Western Himalayas (Kashmir, Punjab and Himachal, Kumaon Himalayas),
2. Central Himalayas (Nepal Himalayas) and
3. Eastern Himalaya - besides the Purvanchal consisting of the north-eastern ranges.

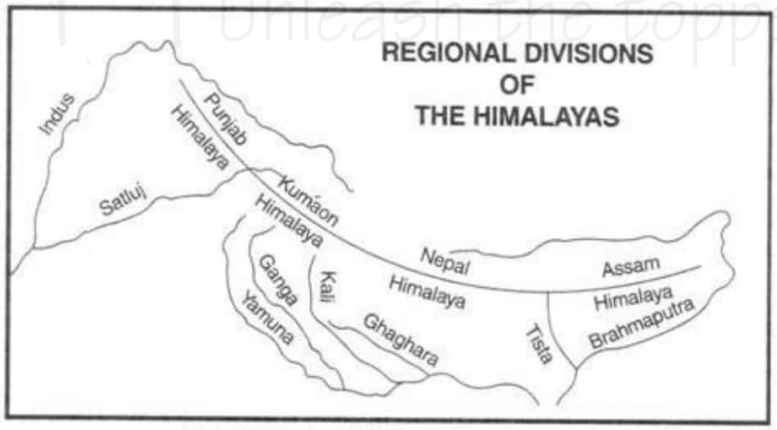
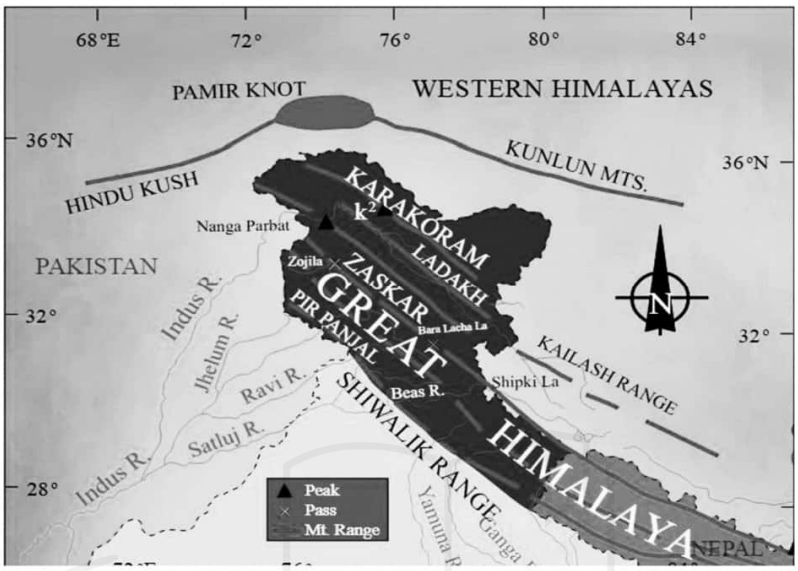



FIG. 3.7. Regional Divisions of the Himalayas

1. The Kashmir Himalayas: Sprawling over an area of about 350,000 sq. km in the state of Jammu and Kashmir, the rang stretches about 700 km in length and 500 km in width. With an average height of 3000 m, it has the largest number of glaciers in India. The Ladakh region of the Kashmir Himalayas is characterised by cold desert conditions. Ladakh is one of the loftiest inhabited regions of the world (3600- 4600m).The gorge of Gilgit is 5200 m in height

above the sea level of the water at its bed. Having a height of 1585m above the sea-level, the total area of the Kashmir Valley is about 4920 sq. km.




A special feature of the Vale of Kashmir is the Karewa (lacustrine) deposits consisting of silt, sand and clay. These karewas are mainly devoted to the cultivation of saffron and have orchards of apple, peach, almond, walnut and apricot. Kashmir Himalayas are characterised by high snow covered peaks, deep valleys, interlocked spurs and High Mountain passes. Pir-Panjal, Banihal (Jawahar Tunnel), Zoji-La, Burzil, Khardungla, Pensi-La, Saser-La, Lanak-La, Jara-La, Taska-La, Chang-La, Umasi-La, and Qara-Tagh-La (Karakoram) are the important passes of the Kashmir Himalayas.

The Himadri: Called the abode of gods, this section of the Himalayas has many snow capped peaks, such as Nanga-Parbat (8119 m), Nanda Devi (7817m), Trisul (7140 m), Nunkun (7135 m), Kamath (7756 m), etc.

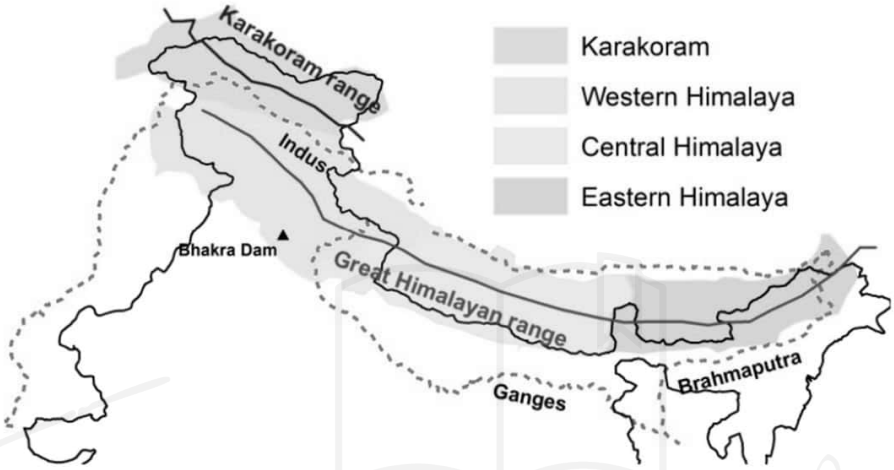
2. The Himachal Himalayas: Stretching over Himachal Pradesh, it occupies an area of about 45,000 sq. km. All the three ranges (the Greater, the lesser, and the Outer Himalayas) are well represented in this region. The northern slopes of the Himachal Himalayas are clothed with thick forests and show plains and lakes, while the southern slopes are rugged and forest clad. Rohtang, Bara-Lacha, and Shipki-La are the important passes which join Himachal Pradesh with Tibet (China). The beautiful and highly productive valleys of Kangra, Kullu, Manali, Lahul, and Spiti lie in Himachal Pradesh. These valleys are well known for orchards and scenic beauty. Shimla, Dalhousie, Chamba, Dharamshala, Kullu-Manali are the important hill stations of this region.

3. The Kumaun Himalayas: The Kumaun Himalayas lie between the Satluj and the Kali rivers, stretching to a length of 20 km and occupying an area of about 38,000 sq. km. Its highest peak is Nanda Devi (7817 m). Among the other peaks Kamet (7756 m), Trisul(7140 m), Badrinath (7138 m), Kedarnath (6940 m) Dunagiri (7066 m), Jaonli or Shivling (6638 m), Gangotri (6615 m), and Bandarpunch (6320 m) are important. Gangotri, Milam, and Pindar are the main glaciers of Uttarakhand. The important hill stations include Mussorrie, Nainital, Ranikhet, Almora, and Bageshwar. The Kumaun Himalayas are connected to Tibet by a number of passes namely, Thaga-La Muling-La (5669 m), Mana Pass, Niti Pass, (5068 m), Tun-Jun-La, Shalsal Pass, Balcha Dhura, Kungrinbingri Pass, Lampiy Dhura, Mangsha Dhura and Lipu Lekh.

4. The Central Himalayas: This range stretches from river Kali to river Tista for about 800 km occupying an area o about 116,800 sq. km. A major part of it lies in Nepal except the extreme eastern part called Sikkim Himalayas, and in the Darjeeling District of West Bengal. All the three ranges of the Himalayas are represented here. The highest peaks of the world like Mt.Everest (8850m), Kanchenjunga (8598 m), Makalu (8481 m), Dhaulagiri (8172 m), Annapurna (8078 m), Manaslu (8154m) and Gosainath (8014m) are situated in this part of the Himalayas. It has very few passes. The passes of Nathu-La and Jelep-La (4538 m in Sikkim) connect Gangtok (Sikkim) with Lhasa Tibet, China). Kanchenjuga: Situated on the border of Sikkim and Tibet, it is the third highest mountain peak in the world. It is 8,598 m above sea level and remains snow covered throughout the year. Some of the important rivers of India like Kosi and Tista have their origin in this mountain.

5. The Eastern Himalayas: These lie between the Tista and the Brahmaputra rivers, covering a distance of about 720 km with an area of 67,500 sq. km. The Eastern Himalayas occupy the state of Arunachal Pradesh (India) and Bhutan. In this part, the Himalayas rise very rapidly from the plains of Assam, and the foothills of Shiwaliks are very narrow. The Eastern Himalayas include the Aka Hills, the Dafla Hills, Miri Hills, Abor Hills, Mishmi Hills, and Namcha Barwa (7756 m). It has a number of mountain passes among which Bomdi-La, Bom La, Tunga, Yonggyap, Diphu, Pangsau, Tse-La, Dihang, Debang (Arunachal Pradesh) are the most important. In the Eastern Himalayas, due to heavy rainfall, fluvial erosion is quite pronounced. On the southern border of Arunachal Pradesh, the Himalayas take a southerly turn and the ranges are arranged in a north-south direction. Passing through the states of Arunachal Pradesh (Tirap Division) Nagaland, Manipur, Tripura, and Mizoram, the Himalayas are locally known as Purvanchal. The main hill of the Eastern Himalayas are Patkai-Bum (Arunachal Pradesh), NagaHills (Nagaland), Manipur Hills, Blue Mountains (Mizoram), Tripura Range, and Brail range. On the border of Nagaland

and Myanmar lies the Arakanyoma. These hills are heavily forested. Northern Myanmar is connected through Diphu, Hpungan, Chaukan, Pangsau, and Likhapani (Arunachal Pradesh). Southwards, a pass joins Imphal (Manipur) with Mandalay (Myanmar). The Purvanchal is joined by the Meghalaya Plateau in the west. The extension of the Myanmar Mountain chain continues southward up to Andaman and Nicobar Islands and even up to the Indonesia.




## THE GREAT PLAINS OF INDIA

The Great Plains of India lies to the south of the Shiwalik separated by the Himalayan Front Fault (HFF). It is a transitional zone between the Himalayas of the north and Peninsular India of the south. This plain formed by the alluvial deposits of the Indus, Ganga, Brahmaputra and their tributaries. The plain stretches for about 2400 km from west to east. It has varying width 90–100 km in Assam, 160 km near Rajmahal (Jharkhand), 200 km in Bihar, 280 km near Allahabad (Prayagraj) and 500 km in Punjab. In general, the width of the plain increases from east to west.

According to recent estimates, the average depth of alluvium in the southern side of the plain (north of Bundelkhand) varies between 1300 to 1400 m, while towards the Shiwaliks, the depth of alluvium increases. The maximum depth of over 8000 m has been reached near Ambala, Yamunanagar, and Jagadhri (Haryana).

### Physiographic Divisions of the Great Plains of India

The Great Plains of India are alluvial fertile plains formed mostly by the depositional process of the Himalayan and Vindhyan rivers. These rivers deposit enormous quantity of sediments along the foothills. Beyond the foothills, the rivers deposit the alluvium in their flood plains. The Northern Plains of India may be divided into the following sub-regions:

1. The Bhabar Plain
2. The Tarai Tract
3. The Bhangar (Bangar) Plains
4. The Khadar Plains
5. Delta Plains

1. The Bhabar Plain: It lies to the south of the Shiwalik from west to east (Jammu Division to Assam). Its width is, however, more in the western plains than in the eastern plains of Assam. In width, the Bhabar tract is generally 8 to 15 km, consisting of gravel and unassorted sediments deposited by the rivers descending from the Himalayas and the Shiwalik. The porosity is so high that most of the small streams (chos and raos) disappear in the Bhabar tract. Only the big rivers are seen flowing over the surface in this tract. The Bhabar tract is not suitable for cultivation of crops. Only big trees with large roots thrive in his region. The inhabitants of the Bhabar are largely the cattle keeping Gujjars.

2. The Tarai Tract: South of the Bhabar tract lies the Tarai belt which is 15–30 km wide. It is a marshy tract infested with mosquitoes. The Tarai is wider in the eastern parts of the Great Plains, especially in Brahmaputra Valley due to heavy rainfall. It is a zone of excessive dampness, thick forests, rich wild life, and malarial climate. In Uttarakhand, Uttar Pradesh, Haryana, Punjab, and Jammu Divisions (J & K) the Tarai forests have been cleared for cultivation of crops. At present, the Tarai belt is known for the good cultivation of sugarcane, rice, wheat, maize, oilseeds, pulses, and fodder. The Tarai, once a marshy zone of jungle and wild grass along the southern edge of the Shiwaliks, has been almost entirely reclaimed for agriculture.

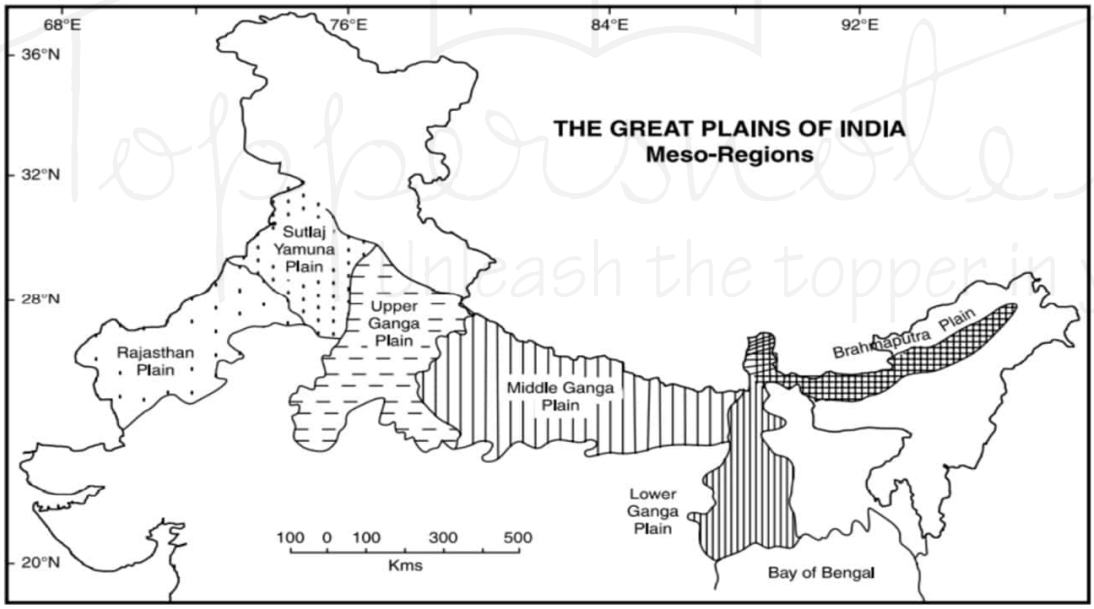
3. The Bhangar (Bangar) Plains: The Bhangar or older alluvial plain, represent the upland alluvial tracts of the Great Plains of India, formed by the older alluviums. The Bhangar formations were deposited during the middle Pleistocene Period. The Bhangar land lies above the flood limits of the rivers. The soil is dark in colour, rich in humus content and productive. It contains concretions and nodules of impure calcium carbonate or "Kankar". In relatively drier areas, the Bhangar also exhibits small tracts of saline and alkaline efflorescences known as "Reh", "Kallar" or "Thur". Bhangar is generally a well drained and the most productive land of the Great Plains of India. The Bhangar deposits have the fossils of elephants, horses, man, rhinoceros, hippopotamus, etc.

4. The Khadar Plains: The new alluvium tracts along the courses of the rivers are known as the "Khadar" or "Bet" lands. The khadar tracts are enriched by fresh deposits of silt every year during the rainy season. The Khadar land consists of sand, silt, clay, and mud. After Independence, most of the Khadar land has been brought under cultivation and devoted to sugarcane, rice, wheat, maize, oilseeds, legumes, and fodder crops. The Khadar deposits have the fossils of living species like man, deer, oxen, buffaloes, horses, elephants, rhino, etc.

## Meso-regions of the Northern Plains of India

On the basis of geo-climatic and topographical characteristics, the Northern Plains of India may be divided into the following four meso-regions:

1. The Plains of Rajasthan
2. The Punjab Haryana Plains
3. The Ganga Plains
4. The Brahmaputra Plains.




## The Plains of Rajasthan

They lie to the west of the Aravallis and include the Marusthali and the Bagar of Rajasthan. The Rajasthan plains cover a total area of about 175,000 sq km. This plain has a general slope from northeast to south-west. In the lower reaches of the Luni river (Gujarat), this plain is only 20 m above sea level. A substantial part of this plain has been formed by the recession of the sea as is evidenced by the presence of salt water lakes (Sambhar, Degana, Didwana, Kuchaman, Lunkaransar-Tal, and Pachpadra). The Sambhar Lake occupying an area of about 300 sq km during

the rainy season lies about 65 km to the north-west of Jaipur city. During the Permo-carboniferous Period, the greater part of the Rajasthan plain was under the sea. It has several dry beds of rivers, like Saraswati and Drisdavati which indicate that the area earlier was fertile. At present, Luni is the only flowing river which reaches the Arabian Sea through the marshes of the Rann of Kachchh. Its water is sweet in the upper reaches but turns brackish in the lower parts. North of the Luni, there is a large area of inland drainage. At present, the greater part of the Rajasthan Plains are a desert covered with longitudinal and transverse sand-dunes and barchans (Barkhans). A large number of playa lakes occur in the basins. In the south-western parts of the Rajasthan plain, there are the alluvial tracts known as Rohi (fertile plains). In the north-eastern part they consist of dry beds of the Ghaggar known as the Ghaggar Plains.

## The Punjab-Haryana Plains

Stretching over an area of about 650 km from north-east to south-west and 300 km from west to east, the Punjab–Haryana Plain is an aggradational plain, deposited by the Satluj, Beas, and Ravi rivers. The height of the plains varies from 300 m in the north-near Jammu and Kathua to 200 m in the south-east. In the east the Delhi Ridge separates it from the Gangetic Plain. The general direction of slope is from north-east to south-west and south. The main topographical features of the Punjab-Haryana Plains are bluffs, locally called as Dhaya, as high as three metres or more, and the Khadar belts known as Bet. The undulating topography south of the Shiwaliks is adversely affected by erosion, caused by the seasonal streams locally called as Chos. The south western parts, especially Hissar District is sandy, characterised by shifting sand-dunes. Satluj, Beas, and Ravi are the only perinneal rivers. Between the Satluj and the Yamuna, the Ghaggar (the ancient Saraswati) is a seasonal stream which passes through Ambala Cantt. Its course is about ten km wide and contains water only during the rainy season.

The Punjab-Haryana Plains may be divided into:

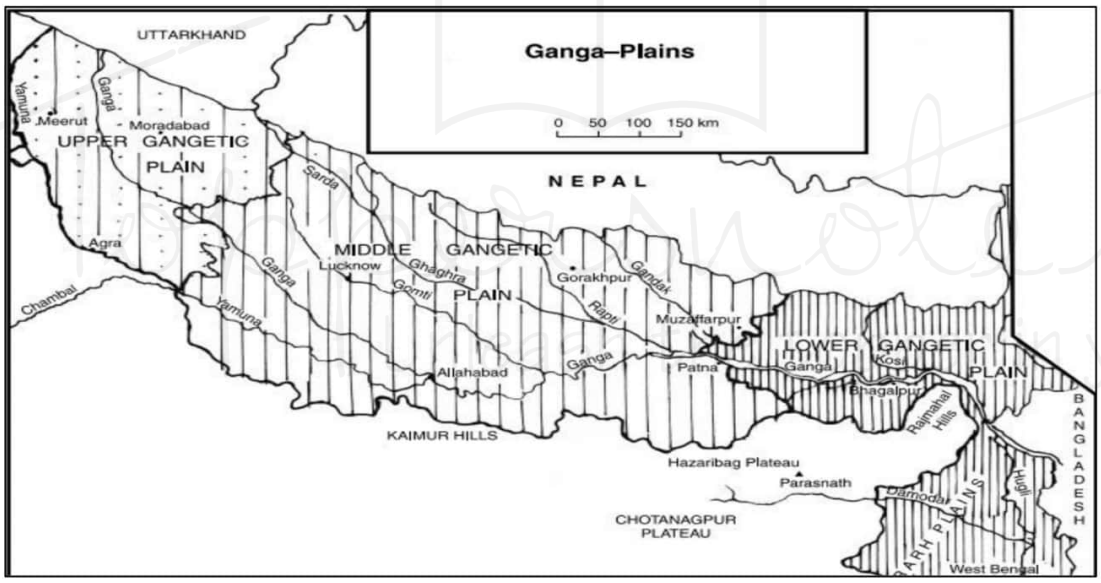
1. The Bari-Doab between the Beas and Ravi,
2. The Bist Doab, between the Beas and Satluj,
3. The Malwa Plain, the central part of the region, and
4. The Haryana-Bhiwani Bagar in the southern and south-eastern parts of the region.

## The Ganga Plains (Total area 357,000 sq km)

The Ganga Plains lie between the Yamuna catchment in the west to the Bangladesh border in the east. It is about 1400 km from west to east and has an average width of 300 km from north to south. The general gradient of the plain is about 15 cm per km from north-west to south-east. The maximum height of this plain is found to the north of Saharanpur (276 m) followed by Roorkee (274 m), Agra (169 m), Kanpur (125 m), Allahabad (98 m), Patna (53 m), Kolkata (6 m), and Sagar Island only 3 m above sea level. The main topographical variations in the plains include, Bhabar, Tarai, Bhangar, Khadar, abandoned courses, dead-channels, Tals, and badlands.

The Ganga Plains can be subdivided into the following sub-regions:

1. The Upper Ganga Plain
2. The Middle Ganga Plain
3. The Lower Ganga Plain




1. <u>The Upper Ganga Plain</u>: The Upper Ganga Plain includes the Ganga-Yamuna Doab, Rohilkhand Division, and parts of the Agra Division. The catchment area of the Yamuna River makes its western boundary, Shiwaliks in the north and 125 m contour in the south. The elevation of the Upper Ganga Plain varies between 100 m to about 300 m. In addition to Ganga and the Yamuna, it is traversed by the Kali and Sharda rivers. A unique feature of the Upper Ganga Plain is the presence of Bhur (undulating, aeolian sandy deposits). Devoted to sugarcane, rice, wheat, maize, pulses, mustard, fodder, vegetables and orchards. It is one of the most productive plains of India in which the Green Revolution is a big success.

2. The Middle Ganga Plain: Sprawling over an area of about 144,400 sq. km, the Middle Ganga Plain includes central and eastern Uttar Pradesh, and the Bihar Plains up to Muzaffarpur and Patna. In the north, it is bounded by the Shiwaliks along the Indo-Nepal border. It has thick alluvial deposits with less Kankar formation. The region is homogeneous and featureless where monotony is broken by river levees, bluffs, ox-bow lakes, Dhus, Tals, Jala and Chaurs (marshy lands). Being a low gradient plain, the rivers often change their courses in this region. Gandak and Kosi are the main left hand tributaries, while the Son is an important right hand tributary of the Ganga in the Middle Ganga Plain.

3. The Lower Ganga Plain: The Lower Ganga Plain extends from Patna in the west, the foot of Darjeeling Himalaya in the north to the Bay of Bengal in the south. It is bordered by Assam and Bangladesh in the east and the Chotanagpur Plateau in the west. In the lower part of the Lower Ganga Plain is Sundarban Delta. The plain has a monotonous surface. The eastern part of the plain is drained by the Tista, Jaldhakia, Sankosh joining the Brahmaputra, and the western part by the Mahananda, Ajay, and Damodar. In the extreme south-west, Kasai and Subarnarekha are the main rivers. The general slope of this plain is towards south and south-east.

   The Lower Ganga Plain has been formed by the downwarping of a part of the Peninsular India between Rajmahal Hills and the Meghalaya Plateau and subsequent sedimentation by the Ganga and the Brahmaputra rivers. The plain has a monotonous surface dissected frequently by the channels of the main streams and their tributaries.

## Rahr Plain

Lying to the east of the Chotanagpur Plateau, it is a part of the Lower Gangetic Plains. Drained by the Damodar and Subarnarekha, it is covered by the lateritic-alluvium soils. Soil erosion is the main problem of the Rahr plain. Rice, maize and pulses are the main crops of the Rahr plain.

## Sundarbans

The largest mangrove swamp in the world, the Sundarbans, or the beautiful forest, gets its name from the Sundari tree which grows well in marshland. It is home to the Royal Tiger and crocodiles.

## The Brahmaputra Plain

Stretching over an area of about 56,275 sq. km, it is the eastern part of the Great Plains of India. It is about 720 km long and about 80 km wide. The region is surrounded by high mountains on all sides, except on the west. It is a depositional plain. The general altitude of the Brahmaputra Plain varies between 130 m in the east to only 30 m in the west. The Assam Valley is characterised by a steep slope along its northern margin but the southern side has a gradual fall from the Meghalaya Plateau. The whole length of the plain is traversed by the Brahmaputra. Due to the low gradient, the Brahmaputra is a highly braided river having numerous islands. Majuli (area 930 sq. km) is the largest river island of India and the second largest in the world after the Marajo Island of the Amazon River. The valley of Brahmaputra also has a number of isolated hillocks on both flanks of the Brahmaputra River. It is one of the most productive plains of India in which rice and jute are the main crops.

There is a marked difference between the physiography of the north and the south banks of the Brahmaputra River. The northern tributaries descending from the Arunachal and Assam Hills form a series of alluvial fans which coalesce and obstruct the courses of the tributaries forcing them to form meanders and adopt parallel course along the main stream, Brahmaputra. Consequently, there are numerous levees along the north bank. This has led to the formation of Bils, ox-bow lakes, marshy tracts, and Tarai lands with dense forest cover. The southern bank of the Brahmaputra is less uneven and less wide. Moreover, the tributaries in the southern part are considerably larger. Here, Dhansiri and Kapili, through their headward erosion have almost isolated the Mikir and Rengma hills from the Meghalaya Plateau.

The valley of Assam may be divided into
1. The Upper Assam and
2. The Lower Assam.

The Upper Assam Valley includes the districts of Lakhimpur, Dibrugarh, Jorhat, and Sibsagar, and the Tezpur Tehsil of Darrang District. It is a monotonous plain except for the low hill ranges along the southern and south-eastern border.

The Lower Assam Valley consists of Nagaon, Dhubri, Goalpara, Barpeta, Kamrup, Nalbari, Kokrajhar, and parts of the Darrang District. This region does not posses monotonous physiographic characteristics since its landscape is interspersed with the spurs of Meghalaya Plateau. Here, the right bank tributaries form a trellis pattern of drainage, while the left bank tributaries exhibit the dendritic pattern. Swamps and marshes are numerous in the northern region of the Lower Brahmaputra Valley. The Brahmaputra: It is one of the great rivers of the world. Flowing eastward to the north of the Himalayas in Tibet (China), it turns sharply south and passes through

Assam before entering Bangladesh. The river valley has fertile alluvial plain which is conducive to growing rice and jute. It is also famous for its tea and the two national parks at Kaziranga and Manas.

## THE COASTAL PLAIN

The Peninsular Plateau of India is flanked by narrow coastal plains of varied width from north to south, known as the West-Coastal Plains and the East Coastal Plains. These coastal plains differ from each other. They were formed by the depositional action of the rivers and the erosional and depositional actions of the sea waves. According to geologists, the origin of the western and eastern coasts of India may be attributed to the faulting and subsidence of the Arabian Sea and the Bay of Bengal towards the close of the Eocene Period. Consequently, alluvial deposits along these coasts are of very recent origin, ranging from Pliocene to recent times. These coastal plains have the evidence of submergence and emergence. The Indian coastal plains may be subdivided into the following three divisions:

1. The Gujarat Coastal Plain
2. The West Coastal Plain
3. The East Coastal Plain.

1. The Gujarat Coastal Plain: The Gujarat plain covers almost the entire state of Gujarat, except the districts of Banaskantha and Sabarkantha. It is formed by the alluvial deposits of Sabarmati, Mahi, Luni, and numerous tiny parallel consequent streams. The Deccan lava lies over the Gujarat plain. The eastern section of Gujarat Plain is a projected of Sindhu-Ganga alluvial tract in Peninsular India. Present rivers have further advanced this deposition to the Gulf of Khambat. The Rann of Katch is an extensive tract of naked tidal mudflats transected by abandoned and live creeks. The Gulf of Katch separates the Rann of Katch from the Kathiawar Peninsula.

2. The West Coastal Plain: It lies between the Sahyadris and the Arabian Sea. It is about 1400 km long and 10 to 80 km wide. It has an elevation up to 150 m above sea level, reaching more than 300 m at places.

   The Western Coastal Plain is characterised mainly by sandy beaches, coastal sand-dunes, mud-flats, and lagoons, alluvial tracts along rivers, estuary, laterite-platforms and residual hills.

   1. The northern part of the coast is called the Konkan (Mumbai-Goa).
   2. The central stretch is called the Kannad Plain.
   3. The southern stretch is referred to as the Malabar Coast.

The northern part of the west coastal plain, known as the Konkan Plain, is about 530 km long and 30 to 50 km wide. Southward is the Karnataka coastal plain which is about 525 km long and 8 to 25 km wide. It is the narrowest part of the West coastal plain. The southern part is known as the Malabar Coast which is about 550 km long and 20–100 km wide. This coast is characterised by sand dunes. Along the coast, there are numerous shallow lagoons and backwaters- Kayals. These lagoons are linked together to facilitate navigation through small country boats. Here, Vembanad and Asthamudi are the important lagoons of the Malabar Coast. The coast shows evidence of emergence.


3. <u>The Eastern Coastal Plain</u>: The eastern coastal plain lies between the Eastern Ghats and the Bay of Bengal, and stretches along the coasts of Odisha, Andhra Pradesh, and Tamil Nadu. These plains are formed by the alluvial fillings of the littoral zone comprising some of the largest deltas of the world. The East–Coastal Plains consist mainly of Recent and Tertiary alluvial deposits. These are gentle, monotonous plains rising gently westward to the foot of the Eastern Ghats. The monotony of the topography is broken by the presence of numerous hills. This coastal plain has a straight shoreline with well-defined beaches of sand. The most famous is the Marina Beach in Chennai. All along the coast, there are several sandbars generally in front of the river mouths. Extending from the Subarnarekha River along the West Bengal-Odisha border to Kanyakumari. A major part of the plains is formed as a result of the alluvial fillings by the rivers Mahanadi, Godavari, Krishna and Cauvery comprising some