

Physiography of India

- India has vast diversity in physical features.
- This diversity of landmass is the result of the large landmass of India formed during different geological periods and also due to various geological and geomorphological process that took place in the crust.
- According to Plate Tectonic theory folding, faulting and volcanic activity are the major processes involved in the creation of physical features of Indian landscape. For example, the formation of the Himalayas in the north of the country attributed to the convergence of Gondwana land with the Eurasian plate.
- The Northern part of the country has a vast expanse of rugged topography consisting of a series of mountain ranges with varied peaks, beautiful valleys and deep gorges.
- The Southern part of the country consists of stable table land with highly dissected plateaus, denuded rocks and developed series of scarps.
- The Great Northern Plains lies between these two landscapes.
- The physical features of India can be grouped under the following Physiographic Divisions:
 1. The Himalayas
 2. The Northern Plains
 3. The Peninsular Plateau
 4. The Indian desert
 5. The Coastal Plains
 6. The Islands



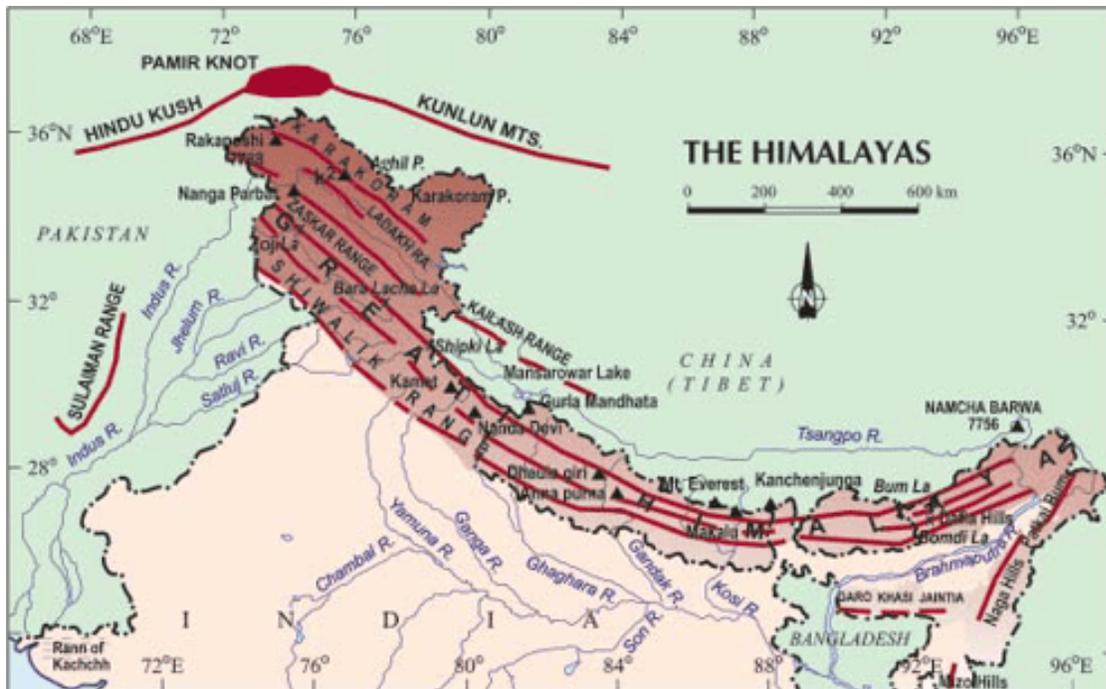
(Figure: various physical features of India)



Source- NCERT

The Himalayas

- The Himalayas are young fold mountains which form the northern boundary for the country.
- The Himalayas is divided based on two lines: one is longitudinal divisions and the other is from west to east.
- The Himalayas consists of series of parallel mountain ranges.
- The Himalayas form an arc, which covers a distance of about 2400 km and the width varies from 400 km in the west to 150 km in the east.
- The altitudinal variations are greater in the eastern part than in the western part.
- On the basis of longitudinal extent, the Himalayas consists of three parallel ridges: The Greater Himalayas or Inner Himalayas or Himadri; Himachal or lesser Himalaya and the outer or Shiwalik Himalayas.
- The Greater Himalayas are the most continuous ranges consisting of the loftiest peaks with an average height of 6000m.
- The folds of Great Himalayas are asymmetrical in nature.
- The core part of this Himalayas consists of granites.
- The general orientation of these ranges is from northwest to southeast direction in north-western part; the east-west direction in Darjeeling and Sikkim Himalayas and southwest to northeast in Arunachal Region.
- The Himachal or lesser Himalayas mainly composed of highly compressed and altered rocks.
- The longest range of this system is Pir Panjal Range.
- This range consists of famous valley of Kashmir, the Kangra and the Kullu Valley.
- The Outer most range of the Himalayas is called the Shiwaliks. They composed of unconsolidated sediments brought down by rivers from the main Himalayan range located farther north.
- The Longitudinal valley lying between lesser Himalayas and Shiwaliks are known as Duns. Example: Dehra Dun, Kotli Dun, Patli Dun.
- The highest peak of Himalayas is: **Everest, Nepal (8848 m)**; Kanchenjunga, India (8598 m); Makalu, Nepal (8481 m)
- On the basis of relief, alignment of ranges and other geomorphological features the Himalayas can be sub-divided into following
 - North-western or Kashmir Himalayas
 - Himachal and Uttarakhand Himalayas
 - Darjeeling and Sikkim Himalayas
 - Arunachal Himalayas
 - Eastern Hills and Mountains



Source- NCERT

North-Western or Kashmir Himalayas

- Important Ranges: Karakoram, Ladakh, Zaskar and Pir Panjal
- Important Glaciers: Siachen, Baltoro, Remo, etc.,
- Important Pass: Zoji la, Bara Lacha la, Banihal, rohtang, etc.,
- Important Peaks: **Nanga Parbat, K2**, etc.,
- Kashmir valley: lies between Greater Himalayas and Pir Panjal Range.
- Cold Desert: between Greater Himalayas and Karakoram Range.
- Important Lakes: Dal and Wular are freshwater lakes, whereas Pangong Tso and Tso Moriri are saltwater lakes.
- The Southernmost part of this region consists of longitudinal valleys known as Duns. Eg: Jammu dun, Pathankot dun, etc.,

Himachal and Uttarakhand Himalayas

- Important Ranges: Great Himalayas, Dhaoladhar, Shivaliks, Nagtibha, etc.,
- Important River System: Indus and Ganga
- Important Hill Stations: Dharmashala, Mussoorie, Shimla, kaosani, etc.,
- Important Pass: Shipki la, Lipu Lekh, Mana pass, etc.,
- Important Glaciers: Gangotri, Yamunotri, Pindari, etc.,
- Important Peaks: Nanda Devi, Dhaulagiri, etc.,

- Important Duns: Dehra Dun (largest), Harike Dun, Kota Dun, Nalagarh Dun, Chandigarh-Kalka Dun, etc.,
- This region is known for five Prayags (River Confluences). Valley of flowers is also situated in this region.

The Darjeeling and Sikkim Himalayas

- This lies between Nepal Himalayas in the west and Bhutan Himalayas in the east.
- It is the region of fast flowing rivers and high mountain peaks.
- Important Peaks: **Kanchenjunga**
- Duar formations replace the Shiwaliks (absent) in this region which enhanced the development of Tea gardens.
- Important Glaciers: Zemu Glacier
- Important Peaks: Nathu La and Jelep La

The Arunachal Himalayas

- This lies between Bhutan Himalayas and Diphu Pass in the east
- Important Peaks: **Namcha Barwa and Kangto**
- Important Rivers: Subansri, Dihang, Dibang and Lohit
- Important Ranges: Mishmi, Abor, Dafla, Mihar, etc.,
- Important pass: Diphu pass

The Eastern Hills and Mountains

- These are the part of Himalayan Mountain system having their general alignment from the north to south direction.
- The Himalaya in the eastern boundary of the country is called as Purvanchal. These are mainly composed of sandstones (sedimentary rocks).
- Important Hills: Patkai Bum, Naga Hills, Manipur Hills, Mizo hills, etc.

THE NORTHERN PLAINS

- The northern plain has been formed by the interplay of the three major river systems – the Indus, the Ganga and the Brahmaputra.
- This plain is formed of Alluvial Soil – the deposition of alluvium in a vast basin lying at the foothills of the Himalayas over millions of years.
- It is the densely populated and agriculturally very productive physiographic division of the country.

- According to the variations in the relief features, the northern plain can be divided into four regions (from north to south) – **Bhabar, Terai, Bhangar** and Khadar.
- Bhabar is a narrow belt ranging between 8-10 km parallel to the Shiwalik foothills at the break-up of the slope. The river after descending from the mountains deposit pebbles in a narrow belt. All the streams disappear in this belt.
- In the Terai region, south of Bhabar belt the streams and rivers re-emerge and create a wet, swampy and marshy region, characterised with thickly forested region full of wildlife
- Bhangar is the region lies south of Terai region. This region is formed by older alluvium. The soil in this region contains calcareous deposits locally known as kankar.
- The region with new alluvium deposits is known as Khadar. They are renewed almost every year and are so fertile, thus ideal for intensive cultivation.
- Riverine Islands – these are the islands which are formed due to depositional work of rivers especially in the lower course due to the gentle slope and resultant decrease in the velocity of rivers. Majuli – in the Brahmaputra is the largest inhabited riverine island in the world
- Distributaries – the rivers in the lower course split into numerous channels sue to deposition of silt are called distributaries.
- Doab – the area which lies behind the confluence of two rivers.

Major Mountain Peaks in India	Description
Godwin Austen (K2)	Highest peak of Karakoram range in POK
Nanga Parbat	Jammu and Kashmir
Nanda Devi	Uttarakhand, Second highest mountain in India and the highest entirely within the country
Kanchenjunga	Nepal and Sikkim (B/w Teesta river in east & Tamur river in the west), the Highest mountain in India & 3rd highest mountain in the world
Nokrek	Highest point of the Garo Hills (Meghalaya)
Gurushikhar	Mt. Abu, Rajasthan, highest point of the Aravalli Range
Kundremukh	Karnataka
Doddabetta	Highest point in Tamil Nadu, near Udhagamandalam (Nilgiri Hills) Second highest peak in the Western Ghats only next to Anamudi

Anaimudi	Located in Kerala, It is the highest peak in the Western Ghats and in South India
Agasthyamalai	Lie at the extreme southern end of Western Ghats, straddle both sides in Kerala and in Tamil Nadu
Saddle Peak	Highest point of the archipelago in the Bay of Bengal, located in North Andaman
Mount Harriet	Third highest peak in the Andaman and Nicobar archipelago only next to, Saddle peak (Highest of Andaman) and Mount Thullier (Highest of Nicobar)
Mahendragiri	Orissa, the Highest peak of Eastern Ghats (According to NCERT)
Arma Konda	Andhra Pradesh

Important Passes in India

State	Pass name	Comment
Jammu and Kashmir	Banihal Pass	Jammu to Srinagar
Jammu and Kashmir	Chang-La	Ladakh with Tibet
Jammu and Kashmir	Pir-Panjal pass	Between Jammu and Kashmir Valley
Jammu and Kashmir	Zoji La	important road link between Srinagar on one side and Kargil and Leh on the other side
Himachal Pradesh	Bara Lacha La	Connecting Mandi in Himachal Pradesh with Leh in Jammu and Kashmir
Himachal Pradesh	Rohtang Pass	road link between Kullu, Lahaul and Spiti Valleys
Himachal Pradesh	Shipki La	Himachal Pradesh and Tibet
Uttarakhand	Lipu Lekh	trijunction of Uttarakhand (India), Tibet (China) and Nepal borders
Uttarakhand	Niti Pass	Uttarakhand with Tibet
Sikkim	Nathu La	Sikkim with Tibet
Sikkim	Jelep La	Sikkim-Bhutan border
Arunachal Pradesh	Bom Di La	Arunachal Pradesh with Bhutan

Arunachal Pradesh	Dihang Pass	Arunachal Pradesh and Myanmar.
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The Peninsular Plateau

- The Peninsular Plateau is formed due to the breaking and drifting of the Gondwana land and thus making it a part of the oldest landmass. This is one of the oldest and stable landmasses in India.
- It is a tableland composed of old crystalline, igneous and metamorphic rocks.
- It is an irregular triangle in structure extends as Delhi ridge in the north-west, Rajmahal hills in the east, Gir range in the west and Cardamom Hills in the south.
- The important physiographic features of this are - block mountains, rift valleys, spurs, bare rocky structures, series of hummocky hills and wall like quartzite dykes offering natural sites for water storage.
- It has undergone recurrent phases of upliftment and submergence accompanied by crustal faulting and fractures.
- On the basis of relief features, the peninsular plateau is divided into three broad groups –
 - The Deccan Plateau
 - The Central Highlands
 - The North-eastern Plateau

The Deccan Plateau

- The Deccan Plateau is a triangular landmass that lies to the south of R. Narmada.
- It is bordered by the Western Ghats in the west, the Eastern Ghats in the east and the Satpura, Maikal and Mahadeo range in the north and north-eastern part.
- An extension of the peninsular plateau is also visible in the north-east known as Karbi-Anglong Plateau and North Cachar Hills.
- The Deccan Plateau is higher in the west and slopes gently eastwards.
- Western and Eastern Ghats are prominent features of the Deccan plateau, the comparison between these two ranges are mentioned in the following table

S. NO.	WESTERN GHATS	EASTERN GHATS
1.	They are continuous and can be crossed only through passes.	They are discontinuous and irregular
2.	Average Elevation – (900 – 1600)m	Average Elevation – 600 m
3.	The altitude increases from north to south	The altitude has no general pattern
4.	Important Hills – Nilgiri, Anaimalai, Cardamom, Babubudan, etc.,	Important Hills – Javadi, Palkonda, Nallamala, Mahendragiri, etc.,
5.	Important Peaks – Anaimudi (highest), Doda Betta (Ooty), Kodaikanal etc.	Important Peaks – Mahendragiri (highest) etc.

6.	Most of the peninsular rivers originate here and acts as a water divide between west-flowing and east-flowing rivers.	They are dissected by major rivers like Mahanadi, Godavari, Krishna, Cauvery, etc., which are draining into the Bay of Bengal
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The Central Highlands

- The Central Highlands is a part of Peninsular Plateau lying north of R. Narmada covering a major area of Malwa plateau, Vindhyan Range covers the southern extent and Aravalis in the north-west.
- The Central Highlands are wider in the west and narrower in the east.
- The plateaus like Bundelkhand, Bagelkhand, Chotanagpur makes the eastern extension of the central highlands.
- The general elevation ranges between 700-1000 m and slopes towards north and north-eastern directions
- This region has undergone metamorphic processes in its geologic history, which can be corroborated by the presence of metamorphic rocks such as marble, slate, gneiss, etc.,
- Most of the ranges in this region are examples of relict mountains which are highly denuded and form discontinuous ranges (example: Satpura Range).

The North-Eastern Plateau

- It is an extension of the main peninsular plateau and it is believed that due to the force exerted by the north-eastward movement of the Indian plate at that time of the Himalayan origin a huge fault has been created between the two sides and later got filled up by the depositional activities of the rivers.
- This region consists of many plateaus like Meghalaya Plateau, Karbi Anglong Plateau, etc.,
- This plateau is rich in mineral resources and receives maximum rainfall from the south-west monsoon.
- Important Hills – Khasi, Garo, Jaintia, etc.,

The Indian Desert

- The Great Indian Desert lies in the **north-western region** of the country.
- This region receives low rainfall below 15cm per year and resulted in the arid climate with low vegetation cover – thus this desert region also known as
- The prominent desert features are – Mushroom Rocks, Shifting Dunes and Oasis.
- It is a land of undulating topography dotted with longitudinal dunes and **Barchans**.
- Most of the rivers in this region are **ephemeral**. Example: R. Luni
- Low precipitation and evaporation make it a water deficit region.
- The desert can be divided into two regions: Northern part sloping towards Sindh and the Southern part towards the Rann of Kachchh.

The Coastal Plains

- The Peninsular plateau is covered by marine water in 3 sides: **the Indian Ocean in the South; the Bay of Bengal in the east and the Arabian Sea in the West.**
- The extent of coastline in the country is **6100 km in the mainland** and 7517 km in the entire geographical coast of the country (including Islands).

- On the basis of the location and active geomorphological processes, it can be broadly divided into two: the Western Coastal Plains and the Eastern Coastal Plains.

S. NO.	WESTERN COASTAL PLAINS	EASTERN COASTAL PLAINS
1.	It is an example of submerged coastal plain	It is an example of emergent coastal plain
2.	Western coastal plain is narrower	Eastern coastal plain is broader
3.	They are divided into Kathiawar coast, Konkan coast, Goan Coast and Malabar coast	They are divided into Northern Circar in the north and Coromandel coast in the south
4.	The rivers flowing through this doesn't form any delta	Well developed deltas can be seen here eg. Krishna – Godavari delta
5.	Provides natural conditions for the development of harbours. Example – JNPT, Mumbai.	Most of the ports in this coastal plain are artificial in nature. Example – Chennai Port

The Islands

- Besides the vast physical features in the mainland of the country, there are two major island groups located in both sides of the peninsular plateau.
- The island groups provide the site for Fishing and Port activities.
- Though more than 4000 islands present in Indian territory Andaman and Nicobar and Lakshadweep are the two major island groups.

ANDAMAN & NICOBAR ISLANDS

- The **Andaman and Nicobar Islands** are the chain of islands in north-south extent located in the Bay of Bengal.
- This island group is bigger in size and are more numerous and scattered.
- These islands are the **elevated portion of Submarine Mountains**.
- The entire group of islands are divided into two: Andaman in the north and Nicobar in the South. These two islands are separated by **Ten Degree Channel**.
- Many smaller islands are volcanic in origin and **Barren Island is the only active volcano in India** is situated here.
- Duncan passage lies between south Andaman and Little Andaman.
- Important Peaks: Saddle Peak, North Andaman (738 m); Mount Diavolo, middle Andaman (515 m); Mount Koyob, South Andaman (460 m); Mount Thuiller, Great Nicobar (642 m)
- The coastal line has some coral deposits and beautiful beaches. As it is close to the Equator it experiences convectional rainfall and equatorial type of vegetation.

Note

- Ten Degree Channel**- Between Little Andaman and Car Nicobar
- Duncan Passage**- Between great Andaman and Little Andaman

THE LAKSHADWEEP ISLANDS

- The Lakshadweep Islands group are located in the Arabian Sea, near to the Malabar coast.
- This group of islands are mainly **composed of coral reefs**.
- Kavaratti Island is the administrative headquarters of Lakshadweep islands.
- **Minicoy is the largest island in this group.**
- This island group consists of storm beaches consisting of unconsolidated pebbles, shingles, cobbles and boulders.

Note

- **Nine Degree Channel**- Minicoy is separated from rest of the Lakshadweep
- **Eight Degree Channel**- Lakshadweep Group separated from the Maldives

Other Islands

- **Newmoore Island**- located in the Bay of Bengal on the mouth of Ganga.
- **Pamban Island**- located in Gulf of Manner between Sri Lanka and India.

