

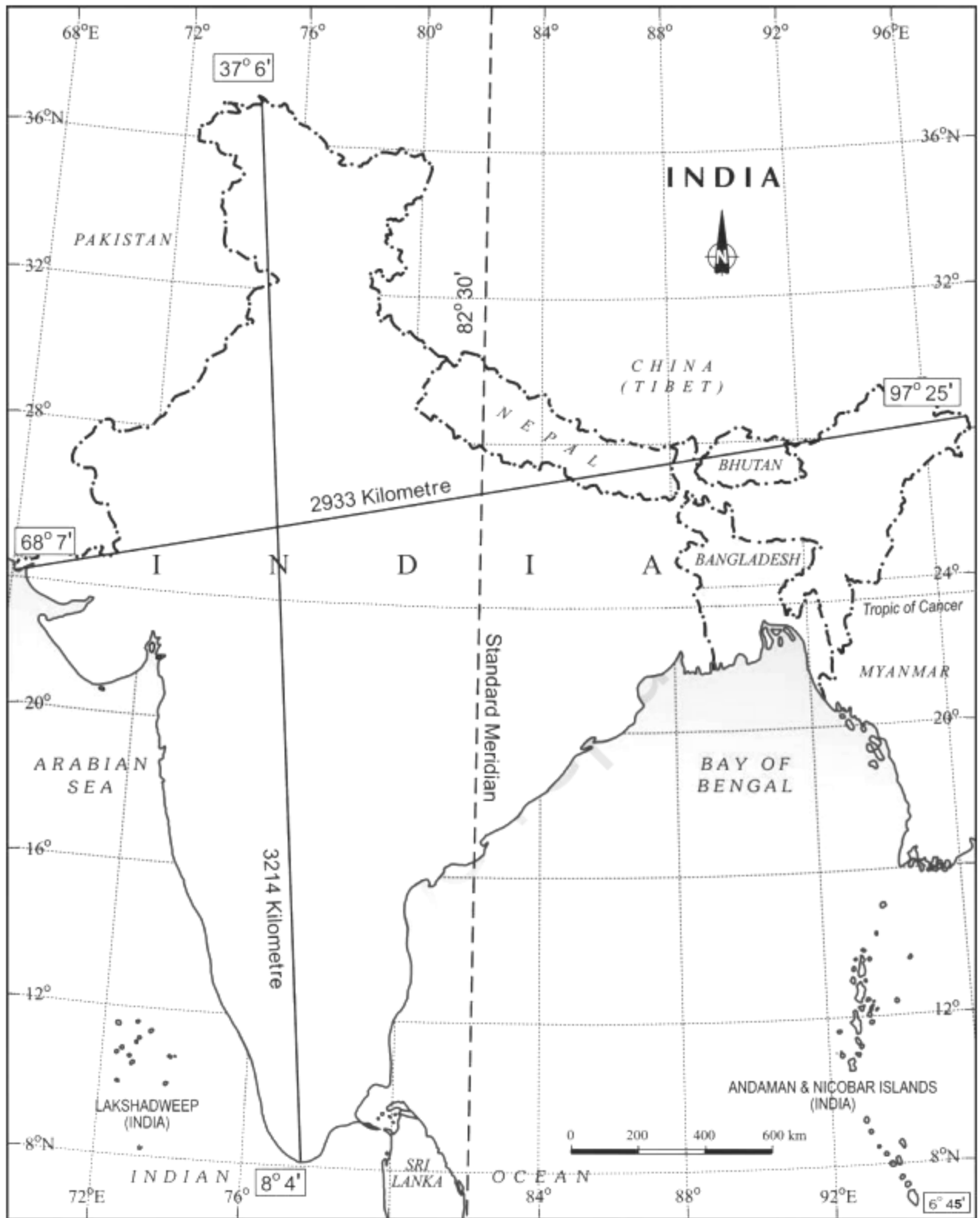
Indian Geography

Geography is an important part of the UPSC syllabus, both for UPSC Prelims and UPSC Mains exams. In this article, you can read all about the Geography of India including its physical features for the [IAS exam](#).

India – Size and Location

Location

- India lies entirely in the Northern Hemisphere and is longitudinally located in the Eastern Hemisphere.
 - Latitude – between $8^{\circ}4' N$ & $37^{\circ}6' N$, from south to north.
 - Longitude – between $68^{\circ}7' E$ & $97^{\circ}25' E$, from west to east.



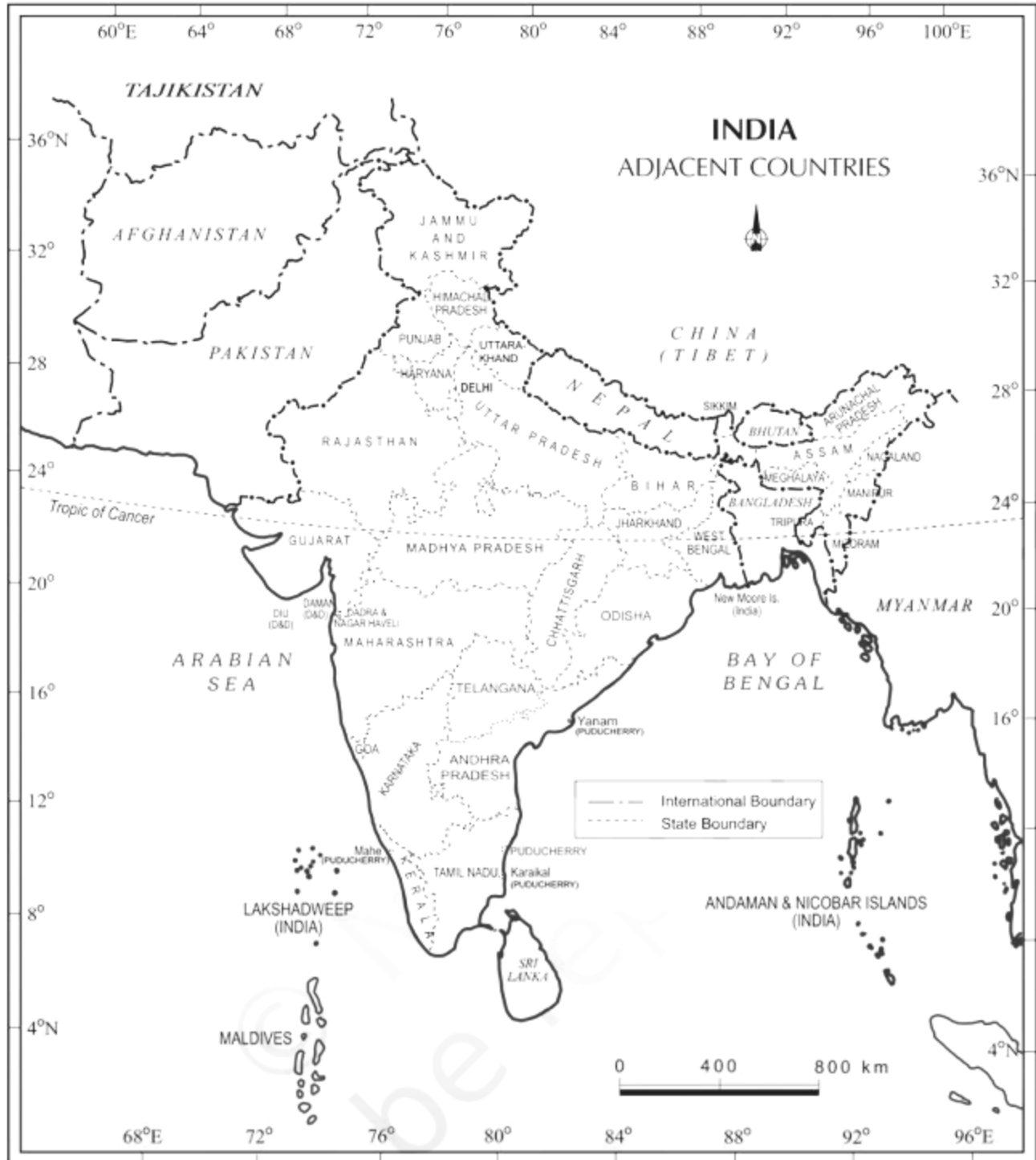
- The Tropic of Cancer ($23^{\circ}30' N$) divides India into almost two equal parts. It passes through eight states – Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Tripura and Mizoram.
- To the south-east of the mainland lies the Andaman and Nicobar Islands in the Bay of Bengal.
- To the south-west of the mainland lies the Lakshadweep Islands in the Arabian sea.
- The southernmost part of India called “Indira Point” (Great Nicobar Island of the Andaman and Nicobar Islands) got submerged under seawater in 2004 during the Tsunami.

Size

- Area – 3.28 million square km.
- Its area is about 2.4 % of the total geographical area of the world.
- It is the 7th largest country in the world. (7 countries in the decreasing order of their size – Russia, Canada, USA, China, Brazil, Australia, India).
- Land boundary – approx. 15,200 km.
- Total length of the coastal line, including Lakshadweep and Andaman & Nicobar islands – 7517 km.
- Both the longitudinal and latitudinal extent of the mainland is approx. 30° , despite the fact that the north-south extent seems to be larger than the east-west.
- The mainland of India extends from Kashmir in the north to Kanyakumari in the south (3214 km) and Arunachal Pradesh in the east to Gujarat in the west (2933 km). The territorial limit of India extends towards the sea up to 12 nautical miles (~ 21.9 km) from the coast. (1 Nautical mile ~ 1.852 km).
- The southern part of the country lies within the Tropics and the northern part lies in the sub-tropical zone or the warm temperate zone. This location is responsible for large variations in landforms, climate, soil types and natural vegetation in the country.
- The Standard Meridian of India ($82^{\circ}30' E$) passes through Mirzapur in Uttar Pradesh and is taken as the standard time for the whole country (there is a time lag of 2 hrs from Gujarat to Arunachal Pradesh). Indian Standard Time is ahead of Greenwich Mean Time by 5 hours and 30 minutes. The Standard Meridian of India passes through Uttar Pradesh, Madhya Pradesh, Chhattisgarh, Telangana and Andhra Pradesh.

India and the World

- India is located in the south-central part of the continent of Asia.
- India shares its land boundaries with seven countries – Pakistan and Afghanistan in the north-west, China, Nepal and Bhutan in the north and Myanmar and Bangladesh in the east. Among these, the longest border is shared by Bangladesh (4096.7 km) and the shortest by Afghanistan (106 km). Across the sea, the southern neighbours are Sri Lanka and the Maldives. Sri Lanka is separated from India by a narrow channel of sea formed by the Palk Strait and the Gulf of Mannar, and Maldives islands are situated to the south of the Lakshadweep islands.



Physical Features of India


Physiography of an area is the outcome of structure, process and the stage of development. The land of India exhibits great physical variations. Geologically, the Peninsular Plateau constitutes one of the ancient landmasses and most stable land blocks on the earth's surface. The Himalayas and the Northern Plains are the most recent landforms. The Himalayan mountains represent a very youthful topography with high peaks, deep valleys and fast-moving rivers. The Northern Plains are formed of alluvial deposits and the Peninsular Plateau is composed of igneous and metamorphic rocks with gently rising hills and wide valleys.

Major Physiographic Divisions

The physical features of India can be grouped under the following physiographic divisions:

Major Physiographic Divisions of India

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



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The Himalayan Mountains

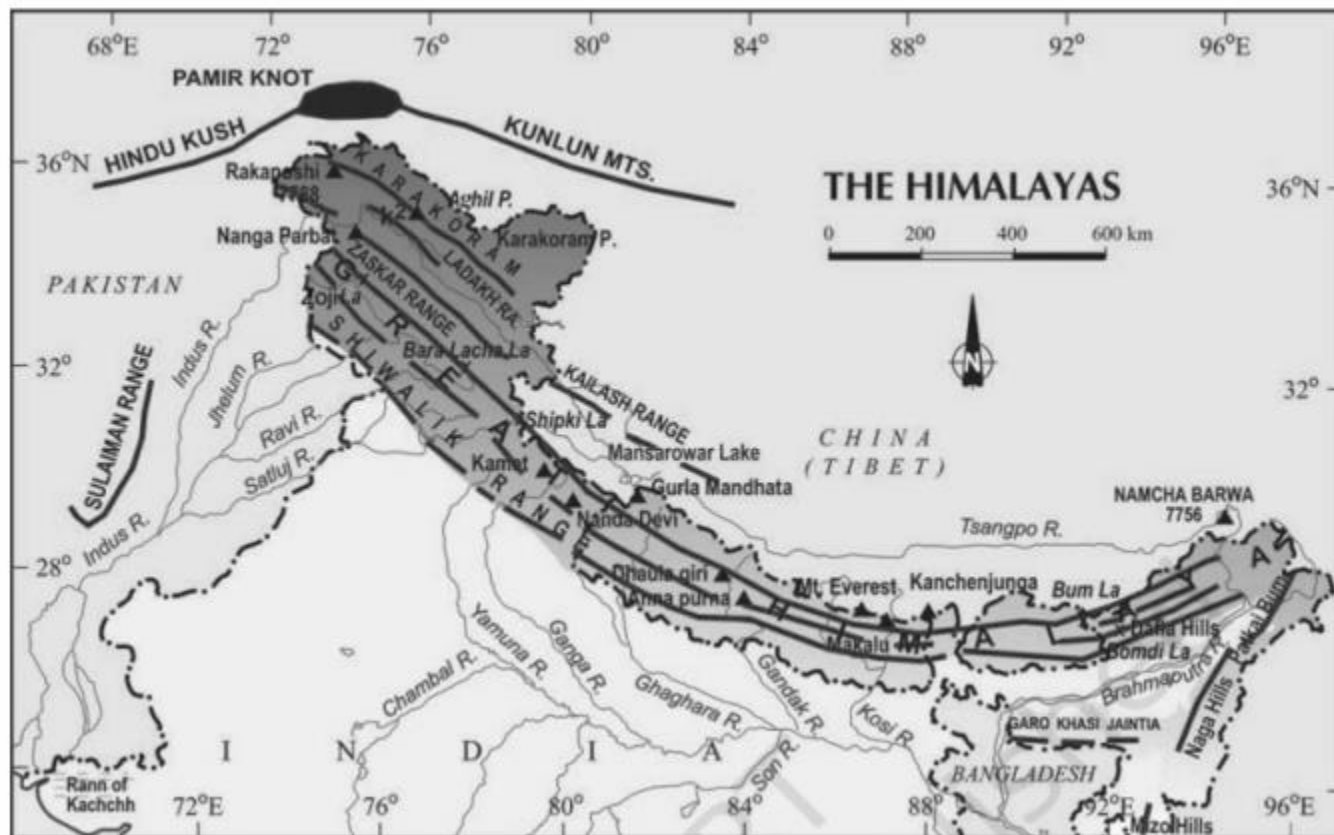
The Himalayas represent the loftiest and one of the most rugged mountain barriers of the world. These mountains are geologically young and structurally fold mountains. The approximate length of the Great Himalayan range, also known as the central axial range is 2500 km from east to west and their width varies from 400 km (Kashmir) to 150 km (Arunachal Pradesh).

The Himalayas consists of four mountain ranges (from north to south) namely

1. The Trans Himalaya or the Tibetan Himalaya
2. The Great or Inner Himalaya or Himadri
3. The Lesser Himalaya or Himachal and
4. The Shiwalik or the outer Himalaya.

a) The Trans Himalaya –

- It is located to the north of the Great Himalaya and consists of Karakoram, Ladakh, Zaskar and Kailash mountain ranges. It is also known as the Tibet Himalayan Region as most parts of these ranges lie in Tibet.



b) The Great or Inner Himalaya or Himadri –

- It is the most continuous range consisting of the loftiest peaks with an average height of 6000 metres.
- It contains all prominent Himalayan peaks and some of the highest peaks are:
- Mount Everest in Nepal – 8848 m.
- Kanchenjunga in India – 8598 m.
- Makalu in Nepal – 8481 m.
- Dhaulagiri in Nepal – 8172 m.
- Nanga Parbat in India – 8126 m.
- Annapurna in Nepal – 8078 m.
- Nanda Devi in India – 7817 m.
- Namcha Barwa in India – 7756 m.

- The folds of the Great Himalayas are asymmetric in nature. The core of this part of the Himalayas is composed of granite. It is perennially snowbound and a number of glaciers descend from this range.

c) The Lesser Himalaya or The Himachal –

- This range lies to the south of Himadri and is composed of highly compressed and altered rocks.
- The altitude varies from 3700 m and 4700 m and the average width is 50 km.
- The famous ranges are the Pir Panjal range (longest), the Dhauladhar and the Mahabharat ranges.
- The range consists of the beautiful valley of Kashmir, Kullu and Kangra valley in Himachal Pradesh. This range is well known for its hill stations.

d) The Shiwaliks or the outer Himalaya –

- The outermost range of the Himalayas is called the Shiwaliks. They extend over a width of 10 – 15 km and have altitudes varying between 900m & 100m. These ranges are composed of unconsolidated sediments brought down by rivers from the main ranges located farther north. These valleys are covered with thick gravel and alluvium.
- Between the Shiwaliks and the lesser Himalayas are longitudinal valleys called Duns. Some of the important Duns are Dehra Dun, Kotli Dun and Patli Dun. Dehradun is the largest of all the duns with an approximate length of 35 – 45 km and a width of 22 – 25 km.

Besides the longitudinal divisions, the Himalayas have been divided on the basis of regions from west to east. These are as follows:

- a. Kashmir or North-Western Himalayas
- b. Himachal and Uttarakhand Himalayas
- c. Darjeeling and Sikkim Himalayas
- d. Arunachal Himalayas
- e. Eastern Hills and Mountains

a) The Kashmir or North-Western Himalayas –

- There are a series of ranges in this region such as Karakoram, Ladakh, Zaskar and Pir Panjal. The north-eastern part of the Kashmir Himalayas is a cold desert, which lies between the Greater Himalayas and the Karakoram range. Between the Greater Himalayas and the Pir Panjal lies the world-famous Kashmir valley.
- The Kashmir Himalayas are famous for Karewa formations which are used for the cultivation of saffron. Karewas are the thick deposits of glacial clay and other materials embedded with moraines.
- Some of the important passes of this region are Khardung La on the Ladakh range, Zojila on the Great Himalayas, Banihal on the Pir Panjal and Photu La on the Zaskar.
- The region is drained by the river Indus and its tributaries such as the Jhelum and the Chenab.
- The southernmost part of this region consists of longitudinal valleys called "Duns", e.g, Jammu Dun and Pathankot Dun.

b) The Himachal and Uttarakhand Himalayas

- This part of the Himalayas lies between the Ravi in the west and the Kali (a tributary of Ghaghara) in the east. This region is drained by two important river systems of India – the Indus and the Ganga. The river Ravi, the Beas and the Satluj (tributaries of the Indus river) and Yamuna and Ghaghara (tributaries of Ganga) flow through this region.
- The three ranges of the Himalayas – The Great Himalayas (Himadri), the Lesser Himalayas (locally known as Dhaoladhar in Himachal Pradesh and Nagtibha in Uttarakhand), and the Shiwalik range from north to south are prominent in this region.
- Some of the important hill stations and health resorts are located in this region such as Dharamshala, Mussoorie, Shimla, etc. Important Duns like Dehra Dun are one of the distinguishing features of this region.

c) The Darjeeling and Sikkim Himalayas

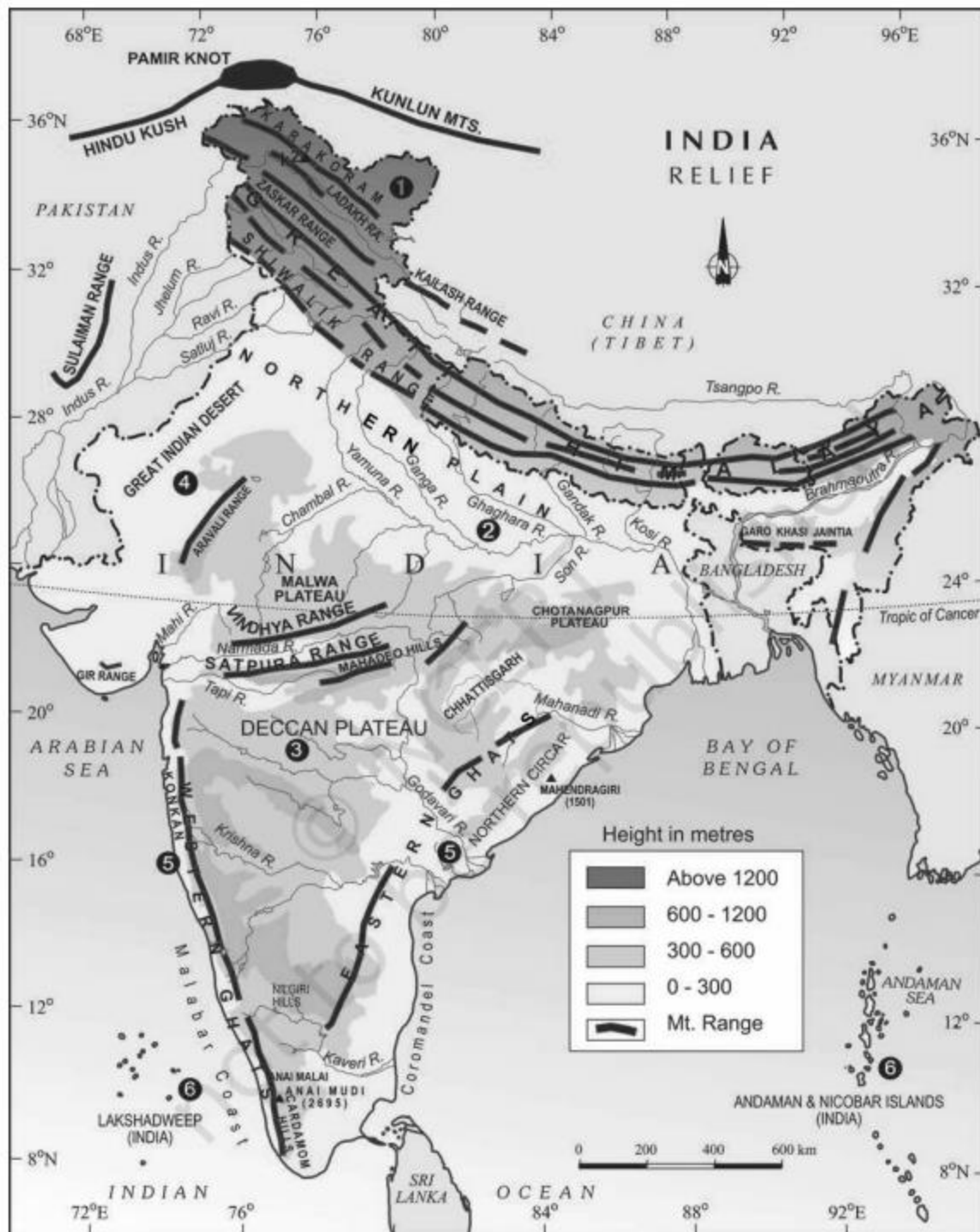
- They are surrounded by Nepal Himalayas in the west and Bhutan Himalayas in the east. It is relatively small but an important part of the Himalayas. It is known for its fast-flowing rivers such as Tista.
- The region is important as it consists of high mountain peaks like Kanchenjunga (Kanchengiri) and deep valleys. Kanchenjunga (8598 m above sea level) is the third highest mountain peak in the world.
- This region (along with Arunachal Himalayas) is marked by the absence of the Shiwalik formation. Instead, this region is important for “Duar formations” which have been used for tea plantations (introduced by the British).

d) The Arunachal Himalayas

- These extend from the east of the Bhutan Himalayas up to the Diphu pass in the east. Kangtu and Namcha Barwa are the important mountain passes of this region.
- These ranges are dissected by fast-moving rivers from north to south, forming a deep gorge after crossing Namcha Barwa. The Subansiri, the Kameng, the Dihang, the Dibang and the Lohit are some of the important rivers of this region. These rivers are perennial with a high rate of fall, therefore, having the **highest hydroelectric power potential** in the country.

e) The Eastern Hills and Mountains

- Beyond the Dihang gorge, the Himalayas bend sharply to the south and spread along the eastern boundary of India. They are known as the Purvanchal or the eastern hills and mountains. These hills running through the northeastern states are mostly composed of strong sandstones, which are sedimentary rocks. Covered with dense forests, they mostly run as parallel ranges and valleys.
- Purvanchal comprises the Patkai hills (Arunachal Pradesh), the Naga hills (Nagaland), the Manipur hills and the Mizo or Lushai hills.



The Northern Plains

- The Great Plains of India lie south to the Shiwalik and represent a transitional zone between the Himalayas of the north and Peninsular India of the south. It is formed by the alluvial deposits of the Indus, Ganga, Brahmaputra and their tributaries. It spreads over an area of 7 lakh sq. km. The

Northern Plains are about 2400 km long and 240 – 320 km broad. With a rich soil cover combined with an adequate water supply and favourable climate, it is an agriculturally productive part of India.

- Northern India is broadly divided into three sections:
 - a. **The Punjab Plains** – The western part of the Northern Plains is referred to as the Punjab Plains. It is formed by the Indus and its tributaries; the larger part of this plain lies in Pakistan.
 - b. **The Ganga Plains** – It extends between the Ghaggar and Teesta rivers. It is spread over the states of Haryana, Delhi, Uttar Pradesh, Bihar, partly Jharkhand and West Bengal to its east.
 - c. **The Brahmaputra Plains** – It lies mainly in Assam.
- According to the variation in relief features, the northern plains can be divided into four regions – Bhabar, Terai, Bhangar and Khadar
 - a. **Bhabar** – The rivers after descending from the mountains deposit pebbles in a narrow belt of about 8 to 16 km in width lying south to the slopes of Shiwaliks and is known as Bhabar. Due to the high porosity of this region, all the streams disappear in this Bhabar belt.
 - b. **Terai** – To the south of the Bhabar is the Terai belt with an approximate width of 10 – 20 km where most of the streams and rivers re-emerge without having any properly demarcated channel, thereby creating marshy and swampy conditions known as the Terai. This region has a luxurious growth of natural vegetation and houses varied wildlife.
 - c. **Bhangar** – It is the largest part of the northern plains and is formed of older alluvium. It lies above the floodplains of the rivers and presents a terrace-like feature. The soil in this region contains calcareous deposits, locally known as Kankar.
 - d. **Khadar** – The newer, younger deposits of the flood plains are called Khadar. Tracts are enriched by fresh deposits of silt every year during the rainy season. This fertile region is ideal for intensive agriculture.

The Peninsular Plateau

The Peninsular upland forms the largest physiographic division of India. With a general elevation between 600 – 900 m, the region constitutes an irregular triangle. Delhi ridge in the northwest (extension of Aravallis), the Raj Mahal hills in the east, Gir range in the west and Cardamom hills in the south constitute the outer extent of the Peninsular plateau. The northeast extension is in the form of the Shillong and Karbi-Anglong plateau.

- The Peninsular plateau is formed due to the breaking and drifting of the Gondwana land and thus, makes it a part of the oldest and most stable landmass of India. It is composed of the old crystalline, igneous and metamorphic rocks.
- Peninsular India is made up of a series of Patland plateaus such as the Hazaribagh plateau, the Palamu plateau, the Ranchi plateau, the Malwa plateau, the Coimbatore plateau and the Karnataka plateau.
- The region had undergone recurrent phases of upliftment and submergence accompanied by crustal faulting and fractures. These spatial variations have brought in elements of diversity in the relief of the Peninsular Plateau. The northwestern part of the plateau has a complex relief of ravines and gorges. The ravines of Chambal, Bhind and Morena are the important ones.

- One of the distinct features of the Peninsular Plateau is the black soil area known as the Deccan Trap. This is of volcanic origin and therefore, rocks are igneous. These rocks have denuded over time and are responsible for the formation of black soil.
- On the basis of the prominent relief features, the Peninsular plateau can be divided into three broad groups –
 - - a. The Central Highlands
 - b. The Deccan plateau
 - c. The North-Eastern plateau

a) The Central Highlands –

- The part of the Peninsular plateau lying to the north of the Narmada river, covering a major area of the Malwa plateau, is known as the Central Highlands. The Malwa Plateau is bordered by the Aravallis in the north and the Vindhyan range in the south. The Aravallis is one of the oldest folded mountains of the world (Its highest peak is Guru Sikhar, 1722 m in height). The Vindhyan range is bounded by the Satpura range in the south. This range forms the northernmost boundary of the Deccan plateau.
- The extension of the Peninsular plateau can be seen as far as Jaisalmer in the west, where it has been covered by longitudinal sand ridges and crescent-shaped sand dunes called barchans. This region has undergone metamorphic processes in its geological history, which can be corroborated by the presence of metamorphic rocks such as marble, slate, gneiss, etc.
- The Central Highlands are wider in the west and narrower in the east. The eastward extensions of this plateau are locally known as the Bundelkhand and Baghelkhand. The Chotanagpur (which is a large reservoir of mineral resources) marks the further eastward extension, drained by the Damodar river.

b) The Deccan Plateau –

- The Deccan Plateau is a triangular landmass that lies to the south of the river Narmada. The Satpura range flanks its broad base in the north, while the Mahadev, the Kaimur Hills and the Maikal range form its eastward extensions. The Deccan Plateau is higher in the west and slopes gently eastwards. An extension of the plateau is also seen in the northeast, locally known as the Meghalaya, Karbi-Anglong Plateau and North Cachar Hills. It is separated by a fault from the Chotanagpur Plateau. Three hill ranges from west to east are the Garo, the Khasi and the Jaintia Hills.
- **Western Ghats –**
 - The Deccan Plateau is bordered by the Western Ghats in the west which runs parallel to the western coast for about 1600 km in the north-south direction from the Tapi river to Kanyakumari (Cape Comorin).
 - Western ghats are locally known by different names such as Sahyadri in Maharashtra, Nilgiri Hills in Karnataka and Tamil Nadu and Anaimalai Hills and Cardamom Hills in Kerala.
 - The Western Ghats are comparatively higher in elevation and more continuous than the Eastern Ghats. Their average elevation is 900-1600 m as against 600 m of the Eastern

Ghats and it increases from north to south. Anaimudi (2695 m) is the highest peak of the Peninsular Plateau which is located on the Anaimalai Hills of the Western Ghats followed by Dodabetta (2637 m) on the Nilgiri hills.

- Most of the peninsular rivers (Godavari, Krishna & Kaveri) have their origins in the Western Ghats.
- The Western Ghats cause orographic rain by facing the rain-bearing moist winds to rise along the western slopes of the Ghats.
- Hill stations like Lonavala, Khandala, Matheran, Mahabaleshwar, Panchgani, etc. are located in this region.
- It is a World Heritage Site and one of the eight hottest hotspots (endangered species) of biological diversity in the world.
- **Know more on the [Western Ghats](#) in the link.**

- **Eastern Ghats –**

- The Eastern Ghats form the eastern boundary of the Deccan Plateau.
- The Eastern Ghats comprises the discontinuous, irregular and low hills which are eroded by the rivers flowing into the Bay of Bengal. Some of the important ranges include Javadi hills, the Palconda range, the Nallamala hills, the Mahendragiri hills (1,501 m which is the highest peak in the Eastern Ghats).
- The [eastern and western ghats](#) meet each other at the Nilgiri hills.

c) The Northeastern Plateau

- It is an extension of the main peninsular plateau. It is believed that due to the force exerted by the north-eastward movement of the Indian plate at the time of the Himalayan origin, a huge fault was created between the Rajmahal hills and the Meghalaya plateau. Later this depression got filled up by the deposition activity of the numerous rivers. Now, the Meghalaya and Karbi-Anglong plateau stand detached from the main peninsular block.
- The Meghalaya plateau is subdivided into the Garo hills, the Khasi hills and the Jaintia hills named after the tribal groups inhabiting this region. An extension of this is also seen in the Karbi Anglong hills of Assam.
- The Meghalaya plateau, like the Chotanagpur plateau, is rich in mineral resources like iron ore, limestone, sillimanite and uranium. This region receives the maximum rainfall from the southwest monsoon. As a result, the Meghalaya plateau has a highly eroded surface. Cherrapunji displays a bare rocky surface devoid of any permanent vegetation cover.

The Great Indian Desert/Thar Desert

A desert is an arid land where the rate of evaporation is greater than the rate of precipitation. More than 60% of the Thar desert lies in Rajasthan.

- To the northwest of the Aravalli hills lies the Great Indian Desert/Thar Desert. It is a land of undulating topography dotted with longitudinal dunes and barchans (crescent-shaped dunes).

- The region receives very low rainfall (below 150 mm per year). It has an arid climate with low vegetation cover. Owing to these characteristic features, it is also known as Marusthali.
- It is believed that during the Mesozoic era, this region was under the sea. The evidence is available at the wood fossils park at Aakal and marine deposits around Brahmsar near Jaisalmer. The approximate age of the wood fossils is estimated to be 180 million years.
- The underlying rock structure of the desert is an extension of the Peninsular plateau but due to extreme arid conditions, its surface features have been carved by physical weathering and wind actions.
- Some of the prominent desert land features present in the Indian desert are mushroom rocks, shifting dunes and oases (mostly in its southern part).
- On the basis of orientation, the desert can be divided into two parts – the northern part, which is sloping towards Sindh and the southern part towards the Rann of Kachchh.
- The Luni is the only large river flowing in the southern part of the desert that reaches the Arabian Sea through the Rann of Kutch. There are some streams that disappear after flowing for some distance and present a typical case of inland drainage by joining a lake or playa. The lakes and playas have brackish water which is the main source of obtaining salt.

The Coastal Plains

The Peninsular plateau is flanked by a stretch of narrow coastal strips, running along the Arabian Sea on the west (Western Coastal Plains) and the Bay of Bengal in the east (Eastern Coastal Plains).

- **The Western Coastal Plains –**
 - The Western Coastal Plains sandwiched between the Western Ghats and the Arabian Sea is a narrow plain. The Western Coastal Plains are an example of submerged coastal plains. It is believed that the city of Dwarka, which once was part of the Indian mainland situated along the west coast is submerged under water. Because of its submergence, it is a narrow belt and provides natural conditions for the development of natural ports along the west coast. Some of the natural ports along the west coast are Kandla, Mazagaon, Mangalore, Cochin, etc.
 - The Western Coastal plains extend from the Gujarat coast in the north to the Kerala coast in the south (approx. 1500 km).
 - The western coast is divided into the following divisions –
 - Kachch and Kathiawar coast in Gujarat.
 - Kokan coast in Maharashtra.
 - Goan coast in Karnataka.
 - Malabar coast in Kerala.
 - The western coastal plains are narrow in the middle and get broader towards the north and south. The rivers flowing through this coastal plain do not form a delta, instead form estuaries.
 - Along the Malabar coast, there are numerous shallow lagoons and backwaters – “Kayals”. These lagoons are linked together to facilitate navigation through small country boats. Vembanad and Asthamudi are the important lagoons of the Malabar coast. The backwaters

are important tourist spots and are of importance for inland navigation and fishing. Every year the famous Nehru Trophy Vallamkali (Boat Race) is held in Punnamada Kayal in Kerala.

- **The Eastern Coastal Plains**

- The Eastern Coastal Plains lies between the Eastern Ghats and the Bay of Bengal. It stretches along the coasts of Odisha, Andhra Pradesh and Tamil Nadu.
- The Eastern Coastal Plains are wider than the Western Coastal Plains and is an example of an emergent coast. The continental shelf extends up to 500 km into the sea, which makes it difficult for the development of good ports and harbours.
- The rivers flowing in this region fall into the Bay of Bengal and form well-developed deltas – the deltas of the Mahanadi, the Godavari, the Krishna and the Kaveri.
- The Eastern Coastal Plain is divided into two divisions:
 - The Northern Circar – These plains consist of deltas of Mahanadi, Godavari and Krishna. These rivers have broken the Eastern Ghats in many places. The important feature of this plain is the Chilika Lake (Odisha, south of the Mahanadi delta), the largest saltwater lake in India.
 - The Coromandel Coast – it extends from the delta of river Krishna to Kanyakumari.

The Islands

There are two major island groups in India – Andaman and Nicobar Islands in the Bay of Bengal and Lakshadweep Islands in the Arabian sea.

- **Andaman and Nicobar Islands**

- Andaman and Nicobar islands consist of about 572 islands/islets. These are situated roughly between 6°N – 14°N (latitude) and 92°E – 94°E (longitude). The two principal groups of islets include Ritchie's archipelago and Labrynth island.
- The Andaman group of islands is in the north and Nicobar is in the south. They are separated by a water body which is called the Ten Degree Channel (10° latitude passes between the Andaman and Nicobar groups of islands).
- It is believed that these islands are an elevated portion of submarine mountains. Barren Island in Nicobar is the only active volcano in India.
- The coastline of these islands has some coral deposits and are known for beautiful beaches. These islands receive conventional rainfall and have an equatorial type of vegetation.
- There is a great diversity of flora and fauna in this group of islands.
- Some of the important mountain peaks in the Andaman and Nicobar islands are Saddle peak (North Andaman – 738m), Mount Diavolo (Middle Andaman – 515m), Mount Koyob (South Andaman – 460m) and Mount Thuiller (Great Nicobar – 642m).

- **Lakshadweep Islands**

- These are scattered between 8°N – 12°N latitude and 71°E – 74°E longitude.
- There are about 36 islands of which 11 are inhabited.

- Minicoy (southernmost) is the largest island with an area of 453 sq.km.
- These islands are located at a distance of 280 – 480 km southwest off the Kerala coast.
- Kavaratti Island is the administrative headquarters of Lakshadweep. This island group has a great diversity of flora and fauna. Pitti island, which is uninhabited, has a bird sanctuary. The entire Lakshadweep is made up of coral deposits.

