

# A Review about Geography of India

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**Abstract – India lies on the Indian Plate, the northern portion of the Indo-Australian Plate, whose continental crust forms the Indian subcontinent. The country is situated north of the equator between 8°04' to 37°06' north latitude and 68°07' to 97°25' east longitude. It is the seventh-largest country in the world, with a total area of 3,287,263 square kilometres (1,269,219 sq mi). India measures 3,214 km (1,997 mi) from north to south and 2,933 km (1,822 mi) from east to west. It has a land frontier of 15,200 km (9,445 mi) and a coastline of 7,516.6 km (4,671 mi).**

**On the south, India projects into and is bounded by the Indian Ocean—in particular, by the Arabian Sea on the west, the Lakshadweep Sea to the southwest, the Bay of Bengal on the east, and the Indian Ocean proper to the South. The Palk Strait and Gulf of Manna separate India from Sri Lanka to its immediate southeast, and the Maldives are some 125 kilometers (78 mi) to the south of India's Lakshadweep Islands across the Eight Degree Channel. India's Andaman and Nicobar Islands, some 1,200 kilometers (750 mi) southeast of the mainland, share maritime borders with Myanmar, Thailand and Indonesia. Kanyakumari at 8°4'41"N and 77°55'230"E is the southernmost tip of the Indian mainland, while the southernmost point in India is Indira Point on Great Nicobar Island. The northernmost point which is under Indian administration is Indira Col, Siachen Glacier. India's territorial waters extend into the sea to a distance of 12 nautical miles (13.8 mi; 22.2 km) from the coast baseline.**

**Key Words : Geography, Wetlands, Soils, Bodies of Water, Islands etc.**

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## INTRODUCTION

The northern frontiers of India are defined largely by the Himalayan mountain range, where the country borders China, Bhutan, and Nepal. Its western border with Pakistan lies in the Karakoram range, Punjab Plains, the Thar Desert and the Rann of Kutch salt marshes. In the far northeast, the Chin Hills and Kachin Hills, deeply forested mountainous regions, separate India from Burma. On the east, its border with Bangladesh is largely defined by the Khasi Hills and Mizo Hills, and the watershed region of the Indo-Gangetic Plain.

The Ganga is the longest river originating in India. The Ganga–Brahmaputra system occupies most of northern, central, and eastern India, while the Deccan Plateau occupies most of southern India. K2, in the Indian state of Jammu and Kashmir, is the highest point in India at 8,611 m (28,251 ft) and the world's 2nd highest peak. Climate across India ranges from equatorial in the far south, to alpine and tundra in the upper reaches of the Himalayas. The geographic view of India is pretty expository and vivid in the terms of area, mountains and relief.

## GEOLOGICAL DEVELOPMENT

India is situated entirely on the Indian Plate, a major tectonic plate that was formed when it split off from the ancient continent Gondwanaland. The Indo-Australian plate is subdivided into the Indian and Australian plates. About 90 million years ago, during the late Cretaceous Period, the Indian Plate began moving north at about 15 cm/year (6 in/yr). About 50 to 55 million years ago, in the Eocene Epoch of the Cenozoic Era, the plate collided with Asia after covering a distance of 2,000 to 3,000 km (1,243 to 1,864 mi), having moved faster than any other known plate. In 2007, German geologists determined that the Indian Plate was able to move so quickly because it is only half as thick as the other plates which formerly constituted Gondwanaland. The collision with the Eurasian Plate along the modern border between India and Nepal formed the orogenic belt that created the Tibetan Plateau and the Himalayas. As of 2009, the Indian Plate is moving northeast at 5 cm/yr (2 in/yr), while the Eurasian Plate is moving north at only 2 cm/yr (0.8 in/yr). India is thus referred to as the "fastest continent". This is causing the Eurasian Plate to deform, and the Indian Plate to compress at a rate of 4 cm/yr (1.6 in/yr).

## POLITICAL GEOGRAPHY

India is divided into 29 states and 7 union territories including The National capital territory. India's borders run a total length of 15,200 km.

Its borders with Pakistan and Bangladesh were delineated according to the Radcliffe Line, which was created in 1947 during Partition of India. Its western border with Pakistan extends up to 3,323 km (2,065 mi), dividing the Punjab region and running along the boundaries of the Thar Desert and the Rann of Kutch. This border runs along the Indian states of Jammu & Kashmir, Rajasthan, Gujarat, and Punjab. Both nations delineated a Line of Control (LoC) to serve as the informal boundary between the Indian and Pakistan-administered areas of Jammu and Kashmir. India shares a 106 km (66 mi) border with Afghanistan in northwestern Kashmir, which the Indian government officially regards as occupied by Pakistan.

India's border with Bangladesh runs 4,096.70 km (2,545.57 mi). West Bengal, Assam, Meghalaya, Tripura and Mizoram are the States which share the border with Bangladesh. Before 2015, there were 92 enclaves of Bangladesh on Indian soil and 106 enclaves of India were on Bangladeshi soil. These enclaves were eventually exchanged in order to simplify the border. After the exchange, India lost roughly 40 km<sup>2</sup> (10,000 acres) to Bangladesh.

The Line of Actual Control (LAC) is the effective border between India and the People's Republic of China. It traverses 4,057 km along the Indian states of Jammu and Kashmir, Uttarakhand, Himachal Pradesh, Sikkim and Arunachal Pradesh. The border with Burma (Myanmar) extends up to 1,643 km (1,021 mi) along the southern borders of India's northeastern states viz. Arunachal Pradesh, Nagaland, Manipur and Mizoram. Located amidst the Himalayan range, India's border with Bhutan runs 699 km (434 mi). Sikkim, West Bengal, Assam and Arunachal Pradesh are the States, which share the border with Bhutan. The border with Nepal runs 1,751 km (1,088 mi) along the foothills of the Himalayas in northern India. Uttarakhand, Uttar Pradesh, Bihar, West Bengal and Sikkim are the States, which share the border with Nepal. The Siliguri Corridor, narrowed sharply by the borders of Bhutan, Nepal and Bangladesh, connects peninsular India with the northeastern states.

## ISLANDS

(The Lakshadweep and the Andaman and Nicobar Islands are India's two major island formations and are classified as union territories.

The Lakshadweep Islands lie 200 to 440 km (120 to 270 mi) off the coast of Kerala in the Arabian sea with an area of 32 km<sup>2</sup> (12 sq mi). They consist of

twelve atolls, three reefs, and five submerged banks, with a total of about 35 islands and islets.)

(The Andaman and Nicobar Islands are located between 6° and 14° north latitude and 92° and 94° east longitude. They consist of 572 islands, lying in the Bay of Bengal near the Myanmar coast running in a North-South axis for approximately 910 km. They are located 1,255 km (780 mi) from Kolkata (Calcutta) and 193 km (120 mi) from Cape Negrais in Burma. The territory consists of two island groups, the Andaman Islands and the Nicobar Islands. The Andaman and Nicobar Islands consist of 572 islands which run in a North-South axis for around 910 km. The Andaman group has 325 islands which cover an area of 6,170 km<sup>2</sup> (2,382 sq mi) while the Nicobar group has only 247 islands with an area of 1,765 km<sup>2</sup> (681 sq mi). India's only active volcano, Barren Island is situated here. It last erupted in 2017. The Narcondum is a dormant volcano and there is a mud volcano at Baratang. Indira Point, India's southernmost land point, is situated in the Nicobar islands at 6°45'10"N and 93°49'36"E, and lies just 189 km (117 mi) from the Indonesian island of Sumatra, to the southeast. The highest point is Mount Thullier at 642 m (2,106 ft).

Other significant islands in India include Diu, a former Portuguese colony; Majuli, a river island of the Brahmaputra; Elephanta in Bombay Harbour; and Sriharikota, a barrier island in Andhra Pradesh. Salsette Island is India's most populous island on which the city of Mumbai (Bombay) is located. Forty-two islands in the Gulf of Kutch constitute the Marine National Park.

## BODIES OF WATER

India has around 14,500 km of inland navigable waterways. There are twelve rivers which are classified as major rivers, with the total catchment area exceeding 2,528,000 km<sup>2</sup> (976,000 sq mi). All major rivers of India originate from one of the three main watersheds:

- The Himalaya and the Karakoram ranges
- Vindhya and Satpura range in central India
- Sahyadri or Western Ghats in western India

The Himalayan river networks are snow-fed and have a perennial supply throughout the year. The other two river systems are dependent on the monsoons and shrink into rivulets during the dry season. The Himalayan Rivers that flow westward into Punjab are the Indus, Jhelum, Chenab, Ravi, Beas, and Sutlej.

The Ganges Basinalone has a catchment of about 1,100,000 km<sup>2</sup>. The Ganges originates from the

Gangotri Glacier in Uttarakhand. It flows southeast, draining into the Bay of Bengal). It enters India in the far-eastern state of Arunachal Pradesh, then flows west through Assam. The Brahmaputra merges with the Ganges in Bangladesh, where it is known as the Jamuna River.

The Chambal, another tributary of the Ganges, via the Yamuna, originates from the Vindhya-Satpura watershed. The river flows eastward. Westward-flowing rivers from this watershed are the Narmada and Tapi, which drain into the Arabian Sea in Gujarat. The river network that flows from east to west constitutes 10% of the total outflow.

The heavy southwest monsoon rains cause the Brahmaputra and other rivers to distend their banks, often flooding surrounding areas. Though they provide rice paddy farmers with a largely dependable source of natural irrigation and fertilisation, such floods have killed thousands of people and tend to cause displacements of people in such areas.

Major gulfs include the Gulf of Cambay, Gulf of Kutch, and the Gulf of Mannar. Straits include the Palk Strait, which separates India from Sri Lanka; the Ten Degree Channel, which separates the Andamans from the Nicobar Islands; and the Eight Degree Channel, which separates the Laccadive and Amindivi Islands from the Minicoy Island to the south. Important capes include the Kanyakumari, the southern tip of mainland India; Indira Point, the southernmost point in India (on Great Nicobar Island); Rama's Bridge, and Point Calimere. The Arabian Sea lies to the west of India, the Bay of Bengal and the Indian Ocean lie to the east and south, respectively. Smaller seas include the Laccadive Sea and the Andaman Sea. There are four coral reefs in India, located in the Andaman and Nicobar Islands, the Gulf of Mannar, Lakshadweep, and the Gulf of Kutch. Important lakes include Sambhar Lake, the country's largest saltwater lake in Rajasthan, Vembanad Lake in Kerala, Kolleru Lake in Andhra Pradesh, Loktak Lake in Manipur, Dal Lake in Kashmir, Chilka Lake(lagoon lake) in Odisha, and Sasthamkotta Lake in Kerala.

## **WETLANDS**

India's wetland ecosystem is widely distributed from the cold and arid located in the Ladakh region of Jammu and Kashmir, and those with the wet and humid climate of peninsular India. Most of the wetlands are directly or indirectly linked to river networks. The Indian governments have identified a total of 71 wetlands for conservation and are part of sanctuaries and national parks. Mangrove forests are present all along the Indian coastline in sheltered estuaries, creeks, backwaters, salt marshes and mudflats. The mangrove area covers a total of 4,461 km<sup>2</sup> (1,722 sq mi), which comprises 7% of the world's total mangrove cover. Prominent mangrove covers are located in the Andaman and Nicobar

Islands, the Sundarbans delta, the Gulf of Kutch and the deltas of the Mahanadi, Godavari and Krishna rivers. Parts of Maharashtra, Karnataka and Kerala also have large mangrove covers.

The Sundarbans delta is home to the largest mangrove forest in the world. It lies at the mouth of the Ganges and spreads across areas of Bangladesh and West Bengal. The Sundarbans is a UNESCO World Heritage Site, but is identified separately as the Sundarbans (Bangladesh) and the Sundarbans National Park (India). The Sundarbans are intersected by a complex network of tidal waterways, mudflats and small islands of salt-tolerant mangrove forests. The area is known for its diverse fauna, being home to a large variety of species of birds, spotted deer, crocodiles and snakes. Its most famous inhabitant is the Bengal tiger. It is estimated that there are now 400 Bengal tigers and about 30,000 spotted deer in the area.

The Rann of Kutch is a marshy region located in northwestern Gujarat and the bordering Sindh province of Pakistan. It occupies a total area of 27,900 km<sup>2</sup> (10,800 sq mi). The region was originally a part of the Arabian Sea. Geologic forces such as earthquakes resulted in the damming up of the region, turning it into a large saltwater lagoon. This area gradually filled with silt thus turning it into a seasonal salt marsh. During the monsoons, the area turn into a shallow marsh, often flooding to knee-depth. After the monsoons, the region turns dry and becomes parched.

## **CLIMATE**

Based on the Köppen system, India hosts six major climatic subtypes, ranging from arid desert in the west, alpine tundra and glaciers in the north, and humid tropical regions supporting rainforests in the southwest and the island territories. The nation has four seasons: winter (January–February), summer (March–May), a monsoon (rainy) season (June–September) and a post-monsoon period (October–December)'.

The Himalayas act as a barrier to the frigid katabatic winds flowing down from Central Asia.' Thus, North India is kept warm or only mildly cooled during winter; in summer, the same phenomenon makes India relatively hot. Although the Tropic of Cancer—the boundary between the tropics and subtropics—passes through the middle of India, the whole country is considered to be tropical.

Summer lasts between March and June in most parts of India. Temperatures can exceed 40 °C (104 °F) during the day. The coastal regions exceed 30 °C (86 °F) coupled with high levels of humidity. In the Thar desert area temperatures can exceed 45 °C (113 °F). The rain-bearing monsoon clouds are attracted to the low-pressure system

created by the Thar Desert. The southwest monsoon splits into two arms, the Bay of Bengal arm and the Arabian Sea arm. The Bay of Bengal arm moves northwards crossing northeast India in early June. The Arabian Sea arm moves northwards and deposits much of its rain on the windward side of Western Ghats. Winters in peninsula India see mild to warm days and cool nights. Further north the temperature is cooler. Temperatures in some parts of the Indian plains sometimes fall below freezing. Most of northern India is plagued by fog during this season. The highest temperature recorded in India was 51 °C (124 °F) in Phalodi, Rajasthan. The lowest was -45 °C (-49 °F) in Kashmir.

## GEOLOGY

India's geological features are classified based on their era of formation. The Precambrian formations of Cudappah and Vindhyan systems are spread out over the eastern and southern states. A small part of this period is spread over western and central India. The Paleozoic formations from the Cambrian, Ordovician, Silurian and Devonian system are found in the Western Himalaya region in Kashmir and Himachal Pradesh. The Mesozoic Deccan Traps formation is seen over most of the northern Deccan; they are believed to be the result of sub-aerial volcanic activity. The Trap soil is black in colour and conducive to agriculture. The Carboniferous system, Permian System and Triassic systems are seen in the western Himalayas. The Jurassic system is seen in the western Himalayas and Rajasthan.

Tertiary imprints are seen in parts of Manipur, Nagaland, Arunachal Pradesh and along the Himalayan belt. The Cretaceous system is seen in central India in the Vindhyas and part of the Indo-Gangetic plains. The Gondwana system is seen in the Narmada River area in the Vindhyas and Satpuras. The Eocene system is seen in the western Himalayas and Assam. Oligocene formations are seen in Kutch and Assam. The Pleistocene system is found over central India. The Andaman and Nicobar Island are thought to have been formed in this era by volcanoes. The Himalayas were formed by the convergence and deformation of the Indo-Australian and Eurasian Plates. Their continued convergence raises the height of the Himalayas by 1 cm each year.

Soils in India can be classified into 8 categories: alluvial, black, red, laterite, forest, arid & desert, saline & alkaline and peaty & organic soils. Alluvial soil constitute the largest soil group in India, constituting 80% of the total land surface. It is derived from the deposition of silt carried by rivers and are found in the Great Northern plains from Punjab to the Assam valley. Alluvial soil are generally fertile but they lack nitrogen and tend to be phosphoric. National Disaster Management Authority says that 60% of Indian landmass is prone to earthquake and 8% susceptible to cyclone risks.

Black soil are well developed in the Deccan lava region of Maharashtra, Gujarat, and Madhya Pradesh. These contain high percentage of clay and are moisture retentive. Red soil are found in Tamil Nadu, Karnataka plateau, Andhra plateau, Chota Nagpur plateau and the Aravallis. These are deficient in nitrogen, phosphorus and humus. Laterite soils are formed in tropical regions with heavy rainfall. Heavy rainfall results in leaching out all soluble material of top layer of soil. These are generally found in Western ghats, Eastern ghats and hilly areas of northeastern states that receive heavy rainfall. Forest soils occur on the slopes of mountains and hills in Himalayas, Western Ghats and Eastern Ghats. These generally consist of large amounts of dead leaves and other organic matter called humus.

## NATURAL RESOURCES

India's total renewable water resources are estimated at 1,907.8 km<sup>3</sup>/year. Its annual supply of usable and replenishable groundwater amounts to 350 billion cubic metres. Only 35% of groundwater resources are being utilised. About 44 million tonnes of cargo is moved annually through the country's major rivers and waterways. Groundwater supplies 40% of water in India's irrigation canals. 56% of the land is arable and used for agriculture. Black soils are moisture-retentive and are preferred for dry farming and growing cotton, linseed, etc. Forest soils are used for tea and coffee plantations. Red soil have a wide diffusion of iron content.

Most of India's estimated 5.4 billion barrels (860,000,000 m<sup>3</sup>) in oil reserves are located in the Mumbai High, upper Assam, Cambay, the Krishna-Godavari and Cauvery basins. India possesses about seventeen trillion cubic feet of natural gas in Andhra Pradesh, Gujarat and Odisha. Uranium is mined in Andhra Pradesh. India has 400 medium-to-high enthalpy thermal springs for producing geothermal energy in seven "provinces"—the Himalayas, Sohana, Cambay, the Narmada-Tapti delta, the Godavari delta and the Andaman and Nicobar Islands (specifically the volcanic Barren Island.)

India is the world's biggest producer of mica blocks and mica splittings. India ranks second amongst the world's largest producers of barite and chromite. The Pleistocene system is rich in minerals. India is the third-largest coal producer in the world and ranks fourth in the production of iron ore. It is the fifth-largest producer of bauxite, second largest of crude steel as of February 2018 replacing Japan, the seventh-largest of manganese ore and the eighth-largest of aluminium. India has significant sources of titanium ore, diamonds and limestone. India possesses 24% of the world's known and economically viable thorium, which is mined along shores of Kerala. Gold had been



mined in the now-defunct Kolar Gold Fields in Karnataka.

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