Geography Optional - 2025

RELIEF FEATURES OF INDIA

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Expanse, height and location of India's landforms (plains, plateaus, hills and mountains) have played a significant role not only in influencing her past history but also her climate, land-use, means of transportation and distribution of population, etc. Their study in relation to man and his needs is vital.

The following are the four major physiographic divisions of India:

(a) A high mountain barrier formed by the Himalayas in the north and the Eastern Highlands also known as Purvachal in the east.

(b) The Plains of Northern India or the Great Plains of India

(c) The Plateau of Peninsular India, stretching south of the Plains of Northern India

(d) The Coastal Lowlands fringing the Plateau of Peninsular India

These four regions are distinctly different from one another in respect of their surface configuration. Whereas the Himalayas are young fold mountains with great magnitude of local relief, highly uneven surface, very steep slopes, little level land and young river valleys, the Peninsular India is an old shield block having peneplain areas (due to prolonged erosion), relict mountains and old river valleys. The Plains of Northern India on the other hand are flat and alluvial without any local relief except bluffs of the old banks of the rivers and are of recent origin. The Coastal Lowlands are flat with deltas protruding and land generally rolling.

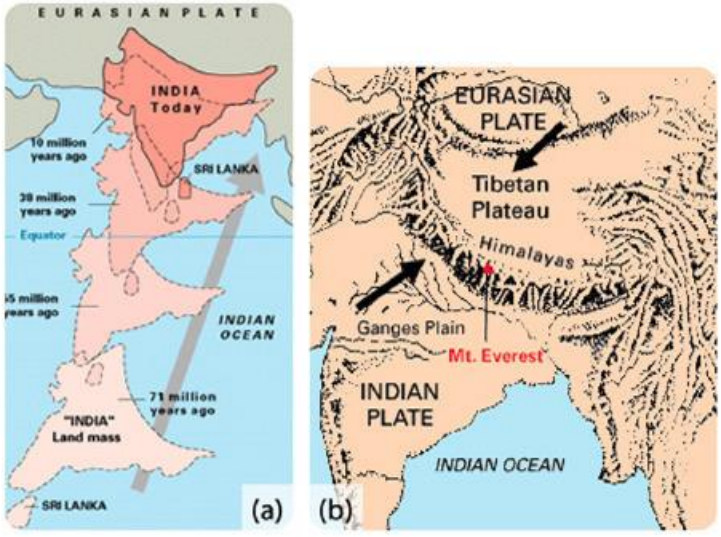
(a) The Himalayas

The Himalayas form a highly rugged and continuous stretch of high mountainous country, which flanks northern India for a considerable length and runs between the Brahmaputra Gorge in the east and the Indus in the west. They are about 2,500 km long and 150 to 400 km broad. They are relatively broad in Himachal Pradesh and Kashmir region and the highest in eastern Nepal. Rising abruptly from the plains in the south, the Himalayas rest against Ladakh district of Jammu and Kashmir State and the Tibetan Plateau in the form of an arc-like rim. Fifty million years ago, the present site of the Himalayas was a part of a large ocean (the Tethys) containing enormous quantities of detritus brought in by the then rivers. Later, in the Miocene period, the ocean bed laden with these enormous deposits was gradually raised by horizontal earth movements into highly complex fold mountain ranges now called the Himalayas. They are among the youngest

fold mountains of the earth. Uplift of the Himalayas, at intervals in later period, rejuvenated the rivers, which have cut alluvial terraces now at different levels. The Himalayas exhibit practically all those landforms which develop when strata is intensely folded. Examples of anticlinal ridges, synclinal valleys, over folds and recumbent folds are common. At some places, compression was so intense that folded strata were first torn across and then pushed off forming nappes. Intermontane plateaus and large-sized basins are conspicuously absent in these intensely folded mountains. The Vale of Kashmir, about 135 km long and 40 km broad, is the only large level strip of land in the Himalayas. It is perhaps a synclinal valley in which the Jhelum has laid its load and has formed it into a level stretch of land. In general, the Himalayas consist of three main ranges – the Siwalik Range along the southern margin, the Great Himalaya along the Tibetan border and in between these two the Lesser Himalaya.

The Siwalik Range – This range has low parallel ridges made up mainly of boulder and clay. These ridges form foothills of the Himalayas. From a breadth of 50 km in the west, it narrows gradually eastwards until it loses its identity in the Bengal Duars. It is generally less than 1,200 m in height and exhibits clearly anticlinal valleys and synclinal ridges. As these ridges were raised after the formation of the Himalayas, they obstructed the course of the rivers draining to the south and west and formed temporary lakes in which debris brought by those rivers was deposited. After the rivers had cut their courses through the Siwalik Range, the lakes were drained away leaving behind plains called duns, such as Dehra Dun (600 m above sea level).

The Lesser Himalaya rises north of the Siwalik Range. Being deeply cut by rivers, this belt of mountains is highly rugged and ill defined. A few ranges, which branch off from the southern flanks of the Great Himalaya, are also included in the Lesser Himalaya. They run in the westward direction and are more clearly defined. Those ranges are – the Dhaola Dhar, the PirPanjal and Nag Tiba. The Mahabharat Range (Nepal) and the Mussorie Range (Kumaun Himalaya) can easily be traced as continuous ranges for long distances. These ranges vary considerably in height, which is generally less than 3,050 m above sea level. Some of their peaks rise to heights of even more than 4,570 m particularly where the ranges branch off from the Great Himalaya, known as also as Himadri, the Lesser Himalaya is 80 km in breadth.



The Great Himalaya or **Himadri** is a long, continuous range. It is the highest range in the world with an average height of 6100 m above sea level. The top of this range, about 25 km wide, is dotted with numerous snowy peaks and it is about 150 km away from the northern edge of the Plains of Northern India. One of its peaks, the Mt. Everest (8,848 m) situated at the

northern border of Nepal, is the highest peak in the world. Its other notable peaks are Kanchenjunga (8,598 m), Makalu (8,481 m), Dhaulagiri (8,172 m) and Nanga Parbat (8,126 m). Near about 80° E meridian, the Great Himalaya shoots off to the northwest a branch called the Zaskar Range. The Zaskar Range runs close to the Great Himalaya. It, however, runs along the northern side of the **Great Himalaya** till it approaches Kargil (Ladakh). In the north-west, the Great Himalaya ends in Nanga Parbat (8,126 m) and in the east, it culminates in Namcha Barwa (7,756 m) near the Brahmaputra in Tibet (the Dihang, being the name of this river in this section of the Himalayas). It is snow-bound throughout the year and sends out glaciers, which descend to a height of 2,440 m above sea level in Jammu and Kashmir State and about 3,960 m in the eastern Himalayas. At their lowest limits, glaciers melt and supply water to the rivers of North India. During early summer when there is no rain in the plains, the water in these rivers has a particular significance because it is tapped for irrigating the parched land in these dry months.

This range is forbidding and can be crossed only by a few passes, which too are snow-bound during winter months. Journey through these passes is hazardous as they are generally higher than 4,570 m above sea level. Pack animals like mules, yaks and goats are used for carrying goods across these passes. The Burzil Pass and the Zoji La in Jammu and Kashmir State, the Bara Lacha La and the Shipki La in Himachal Pradesh, the Thaga La, the Niti Pass and the LipuLekh Pass in Uttar Pradesh and the Nathu La and the Jelep La in Sikkim are generally used for crossing the Great Himalaya. The main India-Tibet trade route connecting Kalimpong (near Darjeeling in India) with Lhasa (Tibet), however, passes through the Jelep La (4,386 m). This range has served as a natural barrier between India and Tibet (China) and has thus accentuated the isolation of our country from the cultural influences of the countries beyond the Himalayas. In addition to its being an insurmountable barrier, so vital for the defence of the northern frontiers of India, this range shuts off almost completely the icy cold winds of inner Asia in winter and confines, on account of its formidable height, the moisture-laden summer monsoon winds to the soil of India. However, it should be noted that so far, the former role of the Great Himalaya is concerned; it has ceased to be our absolutely formidable guardian because of the tremendous advances made in the science of aviation.

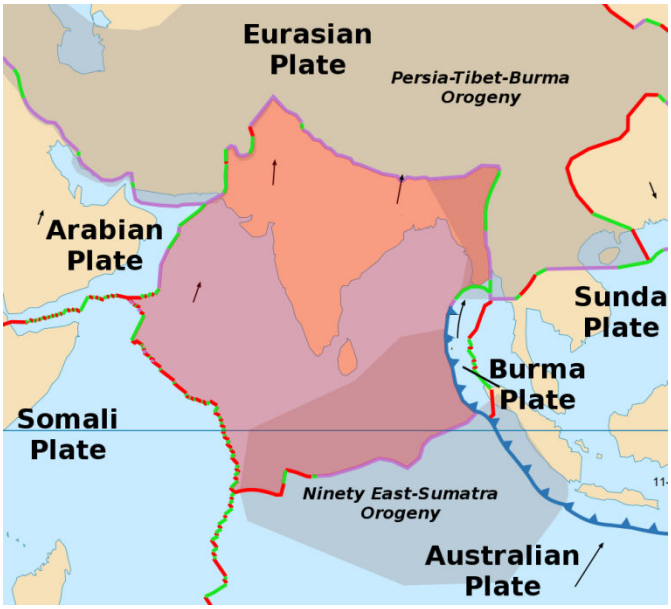
In the northern part of Jammu and Kashmir State, there is another high mountain range called the Karakoram (or the Muztagh). This **trans-Himalayan** range runs roughly in the east-west direction. Heights of some of the peaks of this range are above 7,620 m. K^2 (8611 m), the second highest peak in the world and the first highest peak in the Indian Union It rises majestically lime a cone in the midst of other slightly less higher peaks of the Karakoram Mountains. In the west, this range merges in the Pamir Knot. This bleak, desolate, lofty mountain waste, snow-covered throughout the year like the Great Himalaya, protects India from any danger of attack from the interior of Asia and also keeps off the very dry winds of Central Asia. The northeastern part of Jammu and Kashmir State lying to the north of the Indus is a high plateau with elevation generally above 4500 m.

The Eastern Highlands (Purvachal) – These highlands consist of hill ranges, which pass through eastern Arunachal Pradesh and the states having common border with Burma. They run in north south direction in the form of a crescent the convex side of which points towards India.

In the north lies a high mountainous land called the Dapha Bum (highest point 4,578 m). The Patkai Bum starts from the southern end of the Dapha Bum. After running for some distance southwards along the international boundary between India and Burma, it merges into the Naga Range. Saramati (3,926 m) is the highest peak of the Naga Range. The Patkai and the Naga ranges form watershed between India and Burma. Further south, this mountainous belt is called the Manipur Hills (generally less than 2500 m in elevation) in Manipur State, the Mizo Hills in Mizoram and the Tripura Hills in Tripura State. The elevation of the Mizo Hills is generally less than 1,500 m. The highest point is in Blue Mountain (2,157 m) in the south. In general, the height of the ranges falls gradually southwards.

The ranges are folded and alternate with valleys. This range-and-valley character of the topography has developed trellised drainage pattern. In some synclinal valleys water has collected to form elongated lakes. The ranges and the valleys run generally in north-south direction. They are covered with thick forests and are difficult to cross. They have thus protected eastern border of India in the past. Passes are very few. A poor motorable road connects Imphal with Tamu (Burma) about 87 km away.

Three important rivers of India namely the Brahmaputra, the Sutlej and the Indus have their sources near Lake Manasarowar (Tibet) situated to the north of the Great Himalaya. The sources of these rivers vary in height from 4,570 to 4,875 m. The Great Himalaya, which is about 1.5 km higher than the level of the sources of these rives, is cut across by these rivers to form very deep narrow gorges. According to the view of a few geographers and geologists, these rivers are older than the mountains they cross. These rivers began entrenching their courses in these mountains when they began to rise slowly. Gorges deeper than 3 km are not uncommon. The deepest gorge (5,180 m deep) is found in the course of the Indus where it crosses the Himalayas near Nanga Parbat. A few other rivers such as the Bhagirathi, the Alaknanda, the Karnali, the Gandak, the Arun Kosi, the tista and the Manas have completely cut back their courses in the Great Himalaya and have thus formed very deep gorges. These rivers for some distance run parallel to the mountain ranges before they debouch on the Plains of Northern India. Along the river courses at some places occur river terraces, which show that the uplift of the Himalayas at intervals has rejuvenated the rivers. In the eastern Himalayas, some river valleys are very broad.



(b) The Plains of Northern India

These plains stretch in the east-west direction between the Himalayas in the north and Plateau of Peninsular India in the south. They form a continuous belt of alluvium varying in width from 240 km (east Bihar Plain) to 500 km (Punjab and northern Rajasthan). The Sutlej Plain the west, the Ganga Plain in the middle, the Ganga Delta and the Brahmaputra Valley (from Sadiya downstream) in the east constitute these plains. These are amongst the largest plains of the world. Measuring about 650,000 sq km, they account for one-fifth of the area of India. The desert in the west of the Aravalli Range being largely a plain formed partly by erosion and partly by deposition is also included in the Plains of Northern India. These plains continue to the west beyond the Punjab and Rajasthan and merge into the Indus Plain in Pakistan. These are uniformly level plains without any interruption except for a few outliers of the Aravalli Range such as in the vicinity of Delhi. They form isolated low hills or ridges and emerge out of the surrounding alluvium as islands in the oceans. This region was formerly a deep trench, six to eight km in depth. The trench was formed as a foredeep when the Himalayas rose as fold mountains. This east-west depression received drainage from the Himalayas in the north and the plateau in the south. Owing to continued silting, the depression was filled up with sediments. After the drainage escaped to the Bay of Bengal through the Rajmahal-Garo Hills Gap a level alluvial plain emerged. Uniformity in the level of these plains is mainly due to two facts – (a) deposition took place in water and (b) no earth movement disturbed their flatness later. In the drier parts of the western fringe of Haryana and the neighbouring parts of Rajasthan, deposition of windblown dust accounts, to some extent, for the formation of these level plains. The watershed which divides the Sutlej Plain from the Ganga Plain is low (about 275 m above sea level near Ambala) and is hardly perceptible as one enters the Haryana-Punjab Plain from the Uttar Pradesh Plain.



The rivers being heavily charged with boulders, sand and silt suddenly slacken in speed when they debouch on these plains and deposit their load in the form of gravel fans along the foot of the Himalayas. These fans have merged with one another to form a piedmont plain of gravel and alluvium called **bhabar** in Uttar Pradesh. The southern fringe of the Ganga Plain, particularly between the Chambal and the Son, is broken by numerous ravines turning the fertile alluvial land into unusable bad lands.

The courses of the rivers in these plains are meandering. The ox-bow lakes and cut-off meanders can be traced along the river courses. In the Punjab, Haryana and Uttar Pradesh where rainfall is deficient, these rives have been tapped for irrigation without which famines could not have been eliminated from this densely peopled plain tract. In addition to irrigation, hydroelectric power

has been developed for power supply to industries and domestic use. The rivers are liable to sudden and disastrous floods during the rainy season. Owing to flatness of the plains and large loops of meanders, the rivers are sluggish and fail to carry away water soon after heavy continuous rains. Consequently floods are sometimes sever and miseries of the rural folk untold. Considerable damage is done to the standing crops, houses, roads and railways. In some areas of high water-table, the floodwaters may stand for a few months and thus impede the sowing of Rabi crops. In winter, the volume of water is so small that the rivers appear misfits.

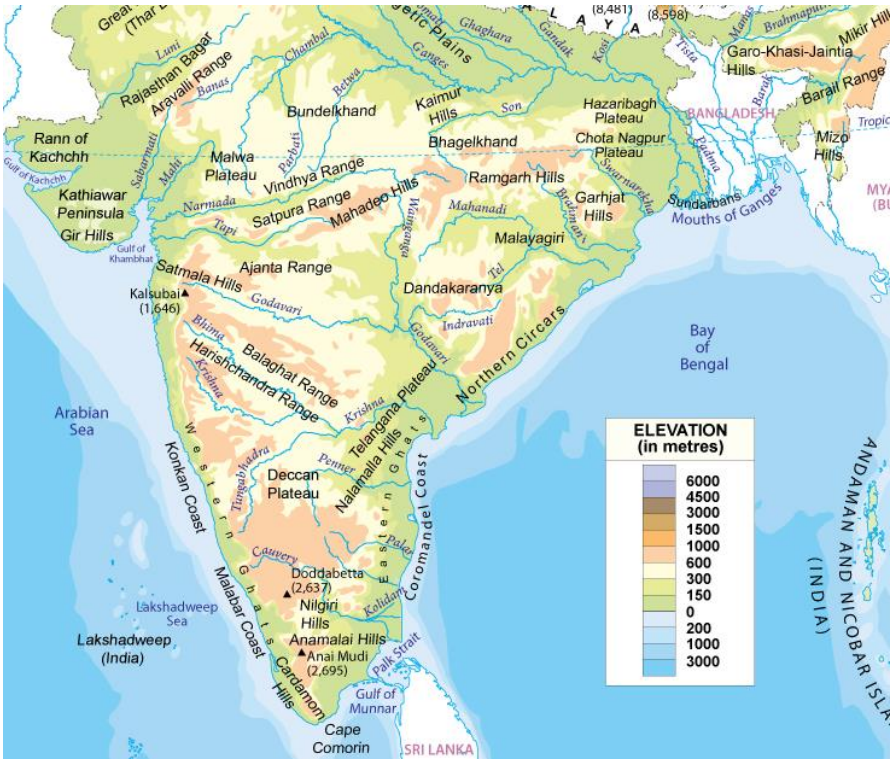
(c) The Indian Plateau

It is also called the Plateau of Peninsular India. South of the alluvial Plains of Northern India, stretches the Plateau of the Peninsular India. It forms a large triangle with its apex in the south at Cape Comorin. It is far older than the Himalayas and is formed essentially of the ancient igneous rocks. The earth movements, which have brought some changes in the landscape of this otherwise stable block of the earth's crust, were vertical and resulted in the formation of faults along which some areas sank forming faulted basins or rift valleys. Some of the basins were out of the reach of the ocean waters. This happened sometime during the Gondwana period when drainage of the neighbouring areas flowed into these basins, deposited sandstones, clays and shales and turned them into swamps. In these swamps grew thick forests, which, owing to subsequent sinking of the basins, turned into coal beds and lay preserved. The position of these Gondwana rocks is roughly marked by the valleys of the Damodar, the Mahanadi and the Godavari. The Narmada and the Tapti valleys opening on to the Arabian Sea are rift valleys formed long after the Gondwana period. The Narmada Rift Valley continues to the northeast and is occupied by the Son. North of the Narmada-Son Trough is the Malwa Plateau, which extends to the Aravalli Range in the west and Bundelkhand granitic rocks in the northeast. The Malwa Plateau is drained to the north and is formed by horizontally bedded sandstones, limestones and shales, which were laid down during the Purana era (earlier than the Gondwana period). During this era, the Malwa Plateau was submerged under the sea. South of the Satpura Range, the peninsula is called the Deccan Plateau. Large-scale volcanic eruptions took place in the Cretaceous period. The lava is thin and, therefore, spread far and wide over the Indian Plateau covering completely the land forms existing at that time. Repeated flows of lava (mainly basalt) from fissures built up a basaltic plateau. The basalt so deposited has, however, been eroded away by rivers from a large area except Maharashtra, southern Malwa Plateau and large parts of Kathiawar and covers an area of 520,000 sq km at present.

The Aravalli Range, about 725 km long runs in the northeast-southwest direction from Deli to the northeastern fringe of Gujarat State. Between Delhi and Ajmer, it is characterised by a chain of detached and discontinuous ridges running also in the northeast-southwest direction and having basins of inland drainage here and there. The range is continuous south of Ajmer. Mt. Abu, a small hilly block (about 1,200 m above sea level) is separated from the main range by the valley of the Banas. Guru Sikhar (1,722 m), the highest peak of the Aravalli Range is situated in Mt. Abu. The Aravalli Range, which is the relic of one of the oldest fold mountains of great height, has been reduced by the processes of weathering and erosion to an average height of 305 m at its northern extremity and to 1,220 m at its southern end.

The Narmada Valley is flanked in the north by a steep sided escarpment of the Malwa Plateau. This escarpment, taken wrongly as a mountain, is known as the Vindhya Range and runs roughly northeastwards along the northern fringe of the Narmada-Son Trough for about 1,200 km. The height of the escarpment in its entire length is generally less than 610 m and is rarely above 730 m. The western part of this range is covered with lava. The eastern part of this range, which is not covered with lava, is known as the Kaimur Hills in the east and the Bhanrer Range in the west. The Kaimur Hills run along the Son.

The Satpura Range – Starting from the West Coastal Plain and running eastwards between the Narmada and the Tapti-Purna rivers, it continues uptoAmarkantak. It is about 900 km long. Its western extremity is known as the Rajpipla Hills and the easternmost part as the Amarkantak Plateau and in between as the Mahadeo Hills. Throughout its length, the Satpura Range has steep sided plateaus of elevations varying from 600 to 900 m. The eastern part of the Amarkantak Plateau known as the Maikala Range overlooks the Chhattisgarh Plain. Dhupgarh (1350 m) near Pachmarhi is the highest point of the Satpura Range. The Rajpipla Hills and the Pachmarhi Plateau are deeply dissected and have a strong local relief. This range is covered mostly with thick layers of basalt. It has two important gaps. The Burhanpur Gap is followed by Bhusawal-Khandwa rail section and the other (situated south of Jabalpur) by Jabalpur-Balaghat rail section.



The Chhattisgarh Plain – It is a basin drained by the Upper Mahanadi. It lies to the east of the Maikala Range and is separated from the Wainganga Valley by low Khairagarh Plateau. The basin is laid with nearly horizontal beds of limestone and shales deposited during the Cuddapah age and is enclosed by hills or plateaus. It is a large area measuring about 73,000 sq km.

The Chota Nagpur Plateau – The northeastern part of the Indian Plateau lying to the east of the Rihand is known as the Chota Nagpur Plateau. It includes the Bihar Plateau, the adjoining eastern fringe of Madhya Pradesh and Purulia district of West Bengal. The Ranchi Plateau in the south, the Hazaribagh Plateau in the north and the Rajmahal Hills in the northeast constitute important physiographic sections of the Chota Nagpur Plateau.

The Ranchi Plateau lies to the south of the Damodar. It is in fact a group of plateaus elevated to different heights. Maximum height is found in its western part where high mesas capped with laterite and known as Pats rise steeply above the surface of the plateau and to an altitude of about 1,100 m (Netarhat Pat 1,119 m). Elsewhere, height is generally about 600 m (Ranchi 661 m). The surface of the plateaus, which is mostly rolling, is occasionally interrupted by monadnocks and conical hills.

The **Hazaribagh Plateau** lies to the north of the Ranchi Plateau. Its elevation is about 600 m. The plateaus surrounding the Hazaribagh Plateau are of lower elevation (about 300 m). Like the Ranchi Plateau, it also has isolated hills on its surface. Parasnath in the eastern part rises to an elevation of 1,366 m.

The **Rajmahal Hills** forming the north-eastern edge of the Chota Nagpur Plateau run in the north-south direction and rise to about 400 (highest point 567 m). Consisting mostly of basalt, these hills have been dissected into separate plateaus.

The rocks of the Indian Plateau re-appear in Meghalaya and form a rectangular block known as the Shillong Plateau or the Meghalaya Plateau. This plateau has been separated from the main block of the Indian Plateau by a wide stretch of alluvial lowland called the Garo-Rajmahal Gap. This gap was formed due to the down faulting of land. The western part of the plateau is called the Garo Hills, the central part the Khasi-Jaintia Hills and the eastern part the Mikir Hills. Nokrek (1,412 m) is the highest peak of the Gargo Hills. The central part of the Khasi Hills is a table-land on which Shillong town is situated. This table-land (highest point 1,961 m) forms the highest part of the Meghalaya Plateau.

To the south of the Satpura Range lies the broad Tapti Valley. It forms the broad plain of Berar in the east and merges into Nagpur Plain. The plains are rolling and fertile and are 300 to 450 m above sea level. To the south of the Tapti Valley is another east-west range named the Ajanta Range, which again is formed of basalt and has plateau-like appearance at the top. It would be of interest to note that in the areas where there are lava flows, the river erosion and weathering processes have broken the land surface into flat-topped plateaus.

The **Deccan Plateau** is bounded on the east by the hills called the Eastern Ghats. These Ghats lying 16 to 105 km away from the East Coast, are broken by the Mahanadi, the Godavari, the Krishna and the Pennar before they fall into the Bay of Bengal. Between the valleys, the blocks of the Eastern Ghats are named separately, the Nallamala Hills between the Pennar and the Krishna and Bastar-Orissa Highlands between the Mahanadi and the Godavari. South of the Penner, the Eastern Ghats form the eastern edge of the Karnataka Plateau. The Javadi Hills, the

Shevaroy Hills and the Pachaimalai Hills in Tamil Nadu are the outliers of the Eastern Ghats. South of the Krishna, height of the Eastern Ghats is generally less than 610 m but north of the Godavari, they are higher and average 920 m in height and rise to 1,680 m (in Vishakhapatnam district), the highest point. MahendraGiri (1,501 m) in Orissa is the second highest point. The Deccan is fringed in the west by the Western Ghats (or the Sahyadri) which run from the lower Tapti Valley to the south as a continuous range till they join the Eastern Ghats in the Nilgiri Hills. The Western Ghats rise abruptly from the western coastal lowlands and rise to an average height of 920 m in Maharashtra and about 1,220 m in Karnataka State. Doda Betta (2,637 m) is the highest peak of the Nilgiri Hills.

The plateau slopes gently towards the east. Consequently the rivers Godavari, Krishna, Pennar and Cauvery (Kaveri) flow to the east. These rivers and their tributaries have carved broad valleys leaving highlands between them. These highlands projecting from the Western Ghats in an eastern or southeastern direction, form long low ranges particularly in the Deccan region of Maharashtra, Andhra Pradesh and northern Karnataka State. The range lying to the north of the upper Godavari valley is called the Ajanta Range and that between the Bhima (tributary of the Krishna) and the upper Godavari is called the Balaghat Range. These ranges having an average height of 610 m attain higher elevation in the west where they merge into the Western Ghats and where some of their peaks rise above 920 m. The broad valley plains between these ranges average about 450 m. Karnataka State is a plateau called the Karnataka Plateau. It rises gradually towards west and south. Its southern part, which is surrounded by the Eastern and Western Ghats and of the elevation of more than 600 m, is called the **Mysore Plateau**. Its western narrow hilly belt about 35 to 80 m in width is called the **Malnad**. North latitude 16° N, the Western Ghats are covered with thick basalt layers due to which the hills and ranges in this region are flat-topped. As these lava layers are of varying hardness slopes have weathered into step-like terraces.

In the extreme south are the Cardamom Hills formed of gneisses and schists. These hills are separated from the Nilgiris by a gap called the Palghat Gap (about 32 km wide). The Cardamom Hills shoot off spurs named as the Palni Hills and the Anaimalai Hills to the east. The Anaimalai Hills (the highest peak named AnaiMudi is 2,695 m above sea level) are the highest in South India. These hills end almost abruptly in the plains on either side.

(d) Coastal lowlands

The Plateau of Peninsular India is fringed with narrow coastal lowlands. Raised beaches and wave-cut platforms above the high water mark signify that these lowlands are essentially the emerged floors of the seas adjacent to the land. After the emergence of these lowlands, fluctuations in sea level, though limited to small areas, have brought about some changes in the general surface features of the littoral.

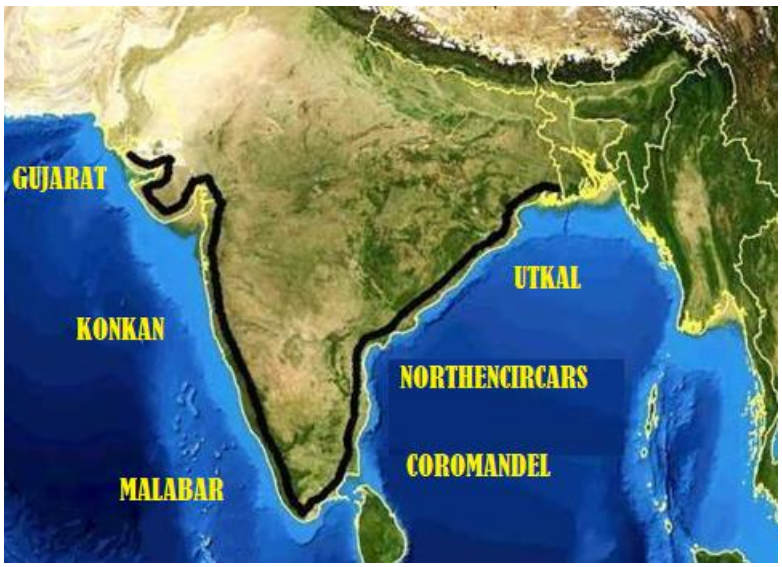
1. West Coastal Lowlands – In the north, topography is varied. There are marshes, lagoons, mud flats, peninsulas, creeks, gulfs and islands. The Rann of Kutch, the peninsulas of Kutch and Kathiawar and the Gujarat Plain stand out as major physiographic regions.

The Rann of Kutch lies to the north of Kutch. Formerly a gulf and now a vast desolate lowland, it has been formed due to the deposition of silt brought mainly by the Indus which drained into it in the past. Its surface, which is only slightly above sea level and interspersed with mudflats, marshes and creeks, merges imperceptibly into the desert to the north and Kutch to the south. It is covered with shallow water during the rainy season and is being filled up gradually by the detritus brought by the rivers. There are a few islands in the Rann. Bela, Khadir and Pachham islands are the only ones of significant size.

Kutch lies to the south of the Rann of Kutch. It was once an island. It is a dry area with generally broad sandy terrain along the coast and the Rann of Kutch and bare low rocky ridges of an elevation of about 300 m in the interior.

Kathiawar is situated to the south of Kutch. It is hilly in the central part and a rolling plain below an elevation of 200 m elsewhere. Gorakhnath (1,117 m) in the Girnar Hills (near Junagadh) is the highest point in Kathiawar. The Gir Hills extending in the east-west direction lie in the south and are connected with a broad hill-mass lying further north in the central part of Kathiawar by a north south running low narrow dissected range. In the northeast, there is a belt of low country, which is marked by Lake Nal and marshes. The Little Rann and the Gulf of Cambay were once connected by a channel of sea-water.

The Tapti, the Narmada, the Mahi and the Sabarmati which are fairly large rivers deposit enormous load of sediments in the Gulf of Cambay. This gulf is, thus, being gradually filled up. As a result, a broad fertile alluvial plain has come into existence north of Daman. The plain extending towards north upto the Aravalli Range is called the **Gujarat Plain**. South of Daman, the coastal lowlands narrows to a width of about 50 km. But it occasionally broadens by a few kilometers at places where streams have gnawed back into the steeply rising Western Ghats. Between Daman and Goa, the western littoral is called the **Konkan**. Coastal lowlands of Goa and the Konkan south of Bombay are marked with the low hills separated by river courses which end in creeks near the sea. The fact that the drowning of the lower courses of the rivers has taken place clearly suggests that there has been some recent submergence, though on a small scale, of the coast, north of Marmagao.



Coastal plain in the vicinity of the Palghat Gap and in the south of Kerala State is relatively broad. In places it broadens to a width of 96 km. offshore bars have enclosed lagoons which run parallel to the coast in southern Kerala State. These lagoons, called **Kayals**, receive water of a large number of rivers before discharging that to the sea with which they are

connected by narrow openings. Formation of lagoons and offshore bars indicate that there has been a slight emergence of southern coastal plain not in the distant past.

The west coastal lowland south of Surat is drained by small rivers which become torrents during the monsoon rainy season. Normally these torrents should have formed deltas. However, at this time strong sea-waves also develop due to south-west monsoon winds. These waves having an unusually great scouring power de silt the mouths of the rivers and thus impede the formation of deltas on the west coast. Instead of deltas, long offshore bars which enclose lagoons, particularly in the south, develop as explained above.

2. East Coastal Lowland – This coastal lowland is broad in Tamil Nadu where its width is 100 to 120 km. north of the Godavari delta where the Eastern Ghats close on the sea, the coastal lowland is narrow. At some places, it is less than 32 km in width. As the Plateau of Peninsular India south of the Satpura Range is tilted to the east, all rivers of the Deccan with the exception of the Tapti flow eastwards towards the Bay of Bengal. These rivers have spread alluvium over almost whole of this plain and have built large deltas at some places. Sea waves being far less furious than those impinging on the west coast, have failed to scour away huge amount of sediments brought by large rivers – the Mahanadi, the Godavari, the Krishna and the Cauvery. Thus, these rivers have built large deltas which being fertile and irrigated is densely peopled. Spits, lagoons and offshore bars also develop along the coast. The coast is fringed at some places with dunes. Mangrove forests also grow along the seaward front of the deltas.
As the sea is shallow near the emerged lowland coasts, deep natural harbours except Mumbai and Marmagao are absent along both the coasts.

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