UNIT 2

GEOGRAPHY OF INDIA

Abstract

CONTAINS MOUNTAINS , PLATEAU, PLAINS,RIVERS,LAKES, GLACIERS

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GENERAL Studies 3

*The great diversity of relief features of our country has been categorized into various **physiographic divisions of India**. Understanding these diverse physiographic divisions of India is essential to developing a grasp of Indian geography and its impact on the country's ecology, agriculture, and socio-economic development. This **article of NEXT IAS** aims to study in detail the physiographic divisions of India, including their formation, geomorphology, sub-divisions, important features, and significance.*

What is Physiography?

Physiography is the branch of geography that studies the physical features of the earth's surface and their relation to its geological structures. In simple terms, the physiography of a region describes the physical characteristics of the region, including mountains, rivers, valleys, plains, and plateaus.

What is Physiographic Division?

Physical division refers to a distinct area of land within a larger region, which possesses its own distinctive landforms and geological features. In simple terms, they effectively categorize large areas based on a common set of physical features.

The concept of physiographic divisions allows us to classify, study, and manage

different areas of a vast region according to their physical characteristics and natural environments.

About Physiographic Divisions of India

The vast expanse of India encompasses a great diversity of relief features. Based on these features, India has been divided into the following **5 physiographic divisions**:

1.	**The Himalayas**
2.	**The Indo-Gangetic Plains**
3.	**The Peninsular Plateau of India**
4.	**The Coastal Plains of India**
5.	**The Indian Islands**

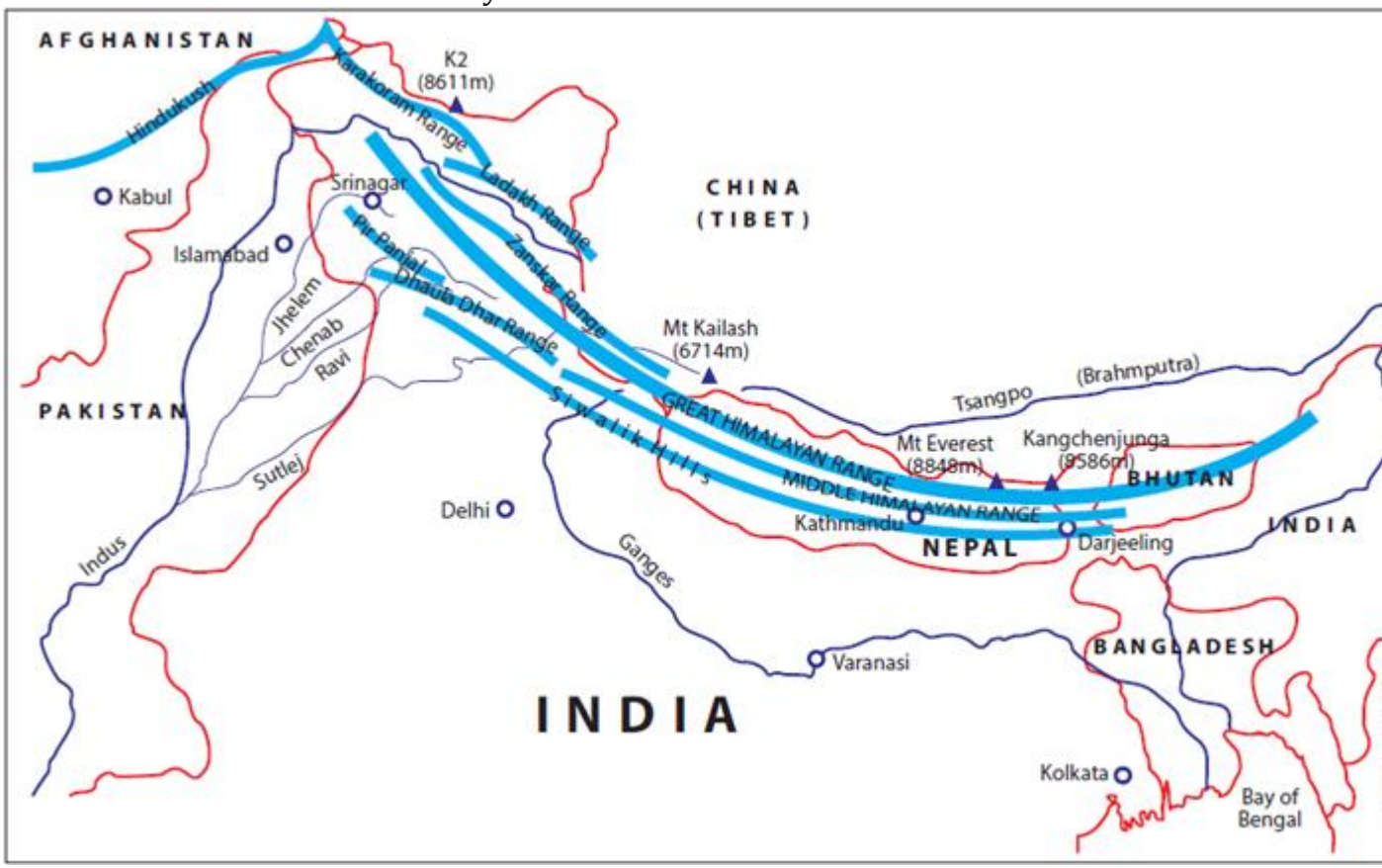
A brief description of each of the 5 physiographic divisions of India is given in the sections that follow.

The Himalayas

The Himalayas are **young fold mountains** formed by the convergence of two tectonic plates. They act as a dividing range between the Tibetan Plateau in the

north and the Indian Subcontinent in the south. They also act as a water divide between the Indo-Gangetic and Tibetan river systems.

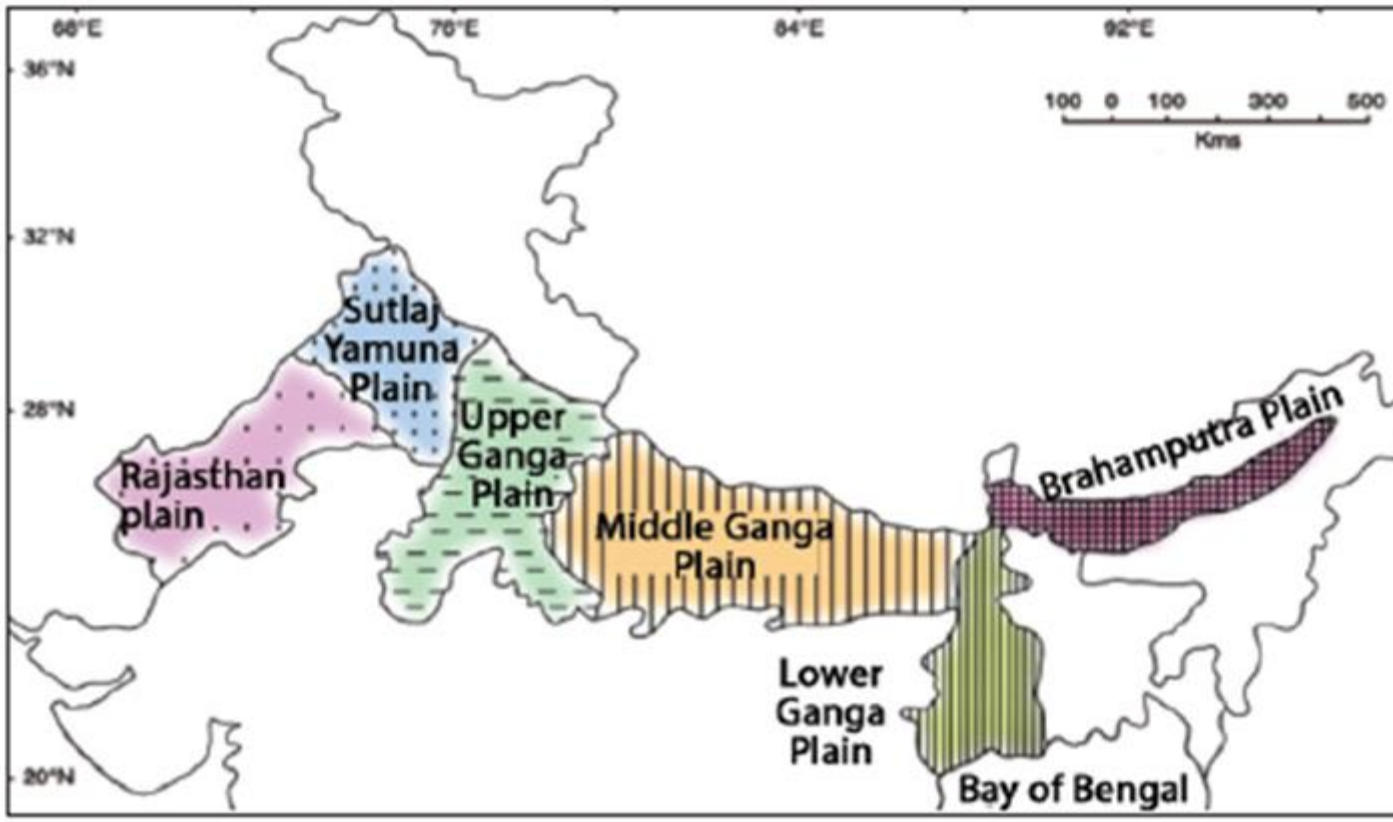
- **Origin**: The Himalayas were formed several million years ago as a result of the convergence of the **Indo-Australian Tectonic Plate** with the **Eurasian (Asian) Tectonic Plate.**
- **Latitudinal Divisions of Himalayas**: Based on the latitudinal extent, the Himalayas can be divided into **3 divisions**:
    - Trans-Himalayas.
    - The Himalayan Mountain Ranges.
    - The Eastern Hills or Purvanchal.
- **Longitudinal Divisions of Himalayas**: Based on the **longitudinal extent**, the Himalayas have been divided into **4 regional divisions**:
    - Punjab Himalayas
    - Kumaon Himalayas
    - Nepal Himalayas
    - Assam Himalayas



The Great Plains of North India

The Indo-Gangetic Plains, also known as the **Indo-Gangetic-Brahmaputra Plains** or the **Great Plains of North India,** refer to an **aggradational plain** formed by the **alluvial deposits** carried by the three rivers – **Indus, Ganga, Brahmaputra,** and their tributaries. Located to the **south of the Himalayas** and extending from the **mouth of the Indus in the west** to the **mouth of the Ganga in the east,** it forms an important **physiographic division of India.**

- **Origin**: These plains are formed by the depositional works of the three rivers – Indus, Ganga, and Brahmaputra, and their tributaries. The sediments of these rivers filled the wide depression that existed between the Peninsular and Himalayan regions.
- **Regional Divisions of the Indo-Gangetic Plains**: Regionally, the Indo-Gangetic Plains are classified into describe how the Himalayas were formed **4 major divisions:**
    - The Rajasthan Plain
    - The Punjab-Haryana Plain
    - The Ganga Plain
    - The Brahmaputra Plain

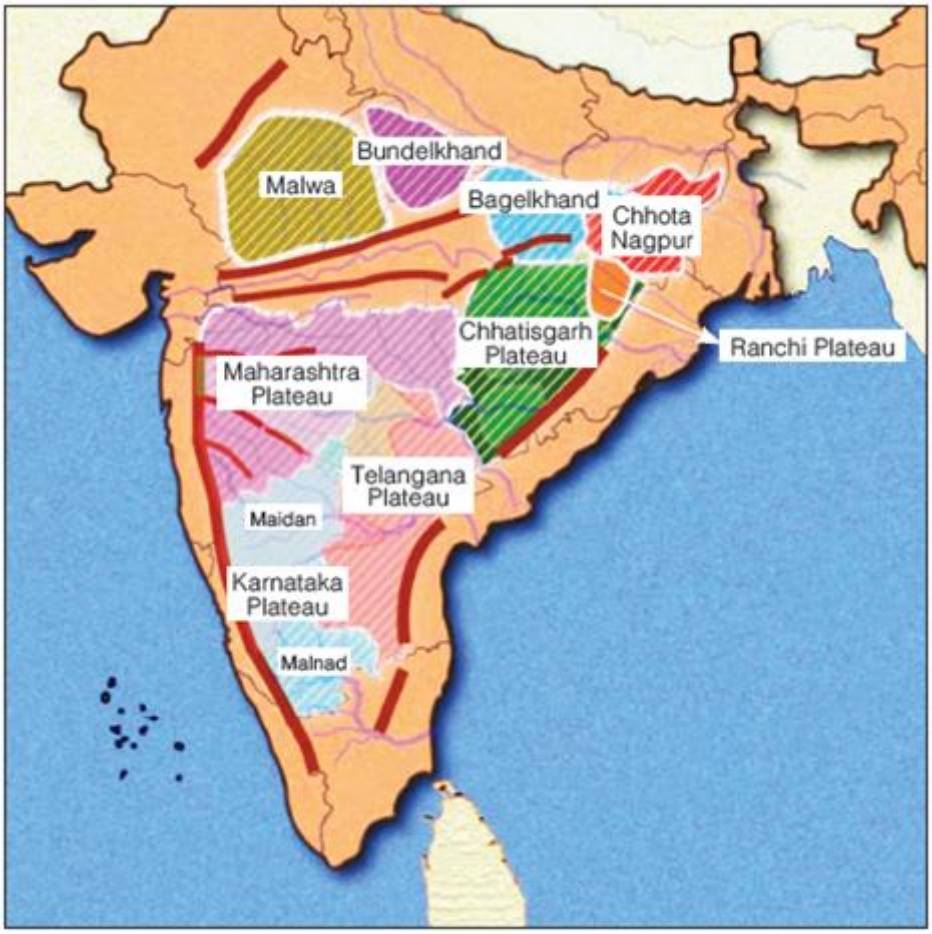


The Peninsular Plateau of India

The **Peninsular Plateau** of India, also known as the **Indian Peninsular Plateau**, forms an important physiographic division of India. It refers to the **flat tableland** that lies in the southern part of India and is surrounded by the **oceans on three sides**. Along with being the **oldest landmass** of India, it also holds the distinction of being the **largest physiographic division** of India.

- **Major Plateaus of Peninsular India**: The Peninsular Plateau of India or the Indian Peninsular Plateau, as a physiographic unit, consists of several smaller plateaus. The prominent smaller plateaus of Peninsular India include:
    - The Marwar Upland
    - The Central Highlands (or the Madhya Bharat Pathar)
    - The Bundelkhand Upland
    - The Malwa Plateau

- The Baghelkhand
- The Chotanagpur Plateau
- The Meghalaya Plateau (Shillong Plateau)
- The Deccan Plateau
- The Chhattisgarh Plain

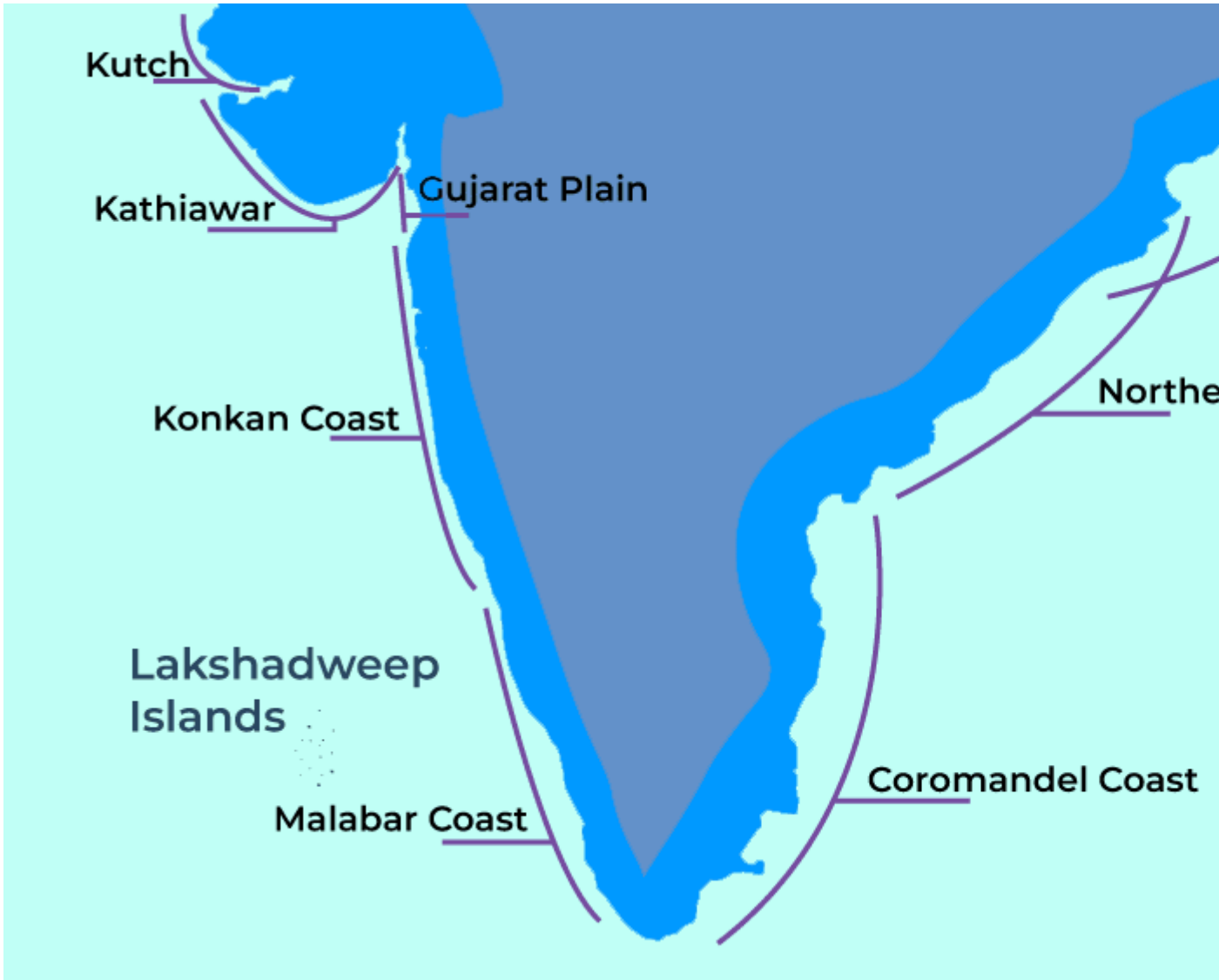


- **Major Hill Ranges of Peninsular India:** The plateaus of Peninsular India are divided from one another by river valleys and hill ranges. Major hill ranges of Peninsular India include:
  - The Aravali Range
  - The Vindhyan Range
  - The Satpura Range
  - The Western Ghats (or the Sahyadris)
  - The Eastern Ghats

The Coastal Plains of India

The **Coastal Plains of India** refers to the stretch of **narrow coastal strip** lying between the edges of the Peninsular Plateau and the coastline of India. As one of the 5 physiographic divisions of India, these plains **stretch** for a distance of about **6000 km** along the **Arabian Sea in the west** and the **Bay of Bengal in the east.**

- **Divisions of the Coastal Plains of India:** These plains can be divided into **two parts:**
    - **The Western Coastal Plains of India**
    - **The Eastern Coastal Plains of India**

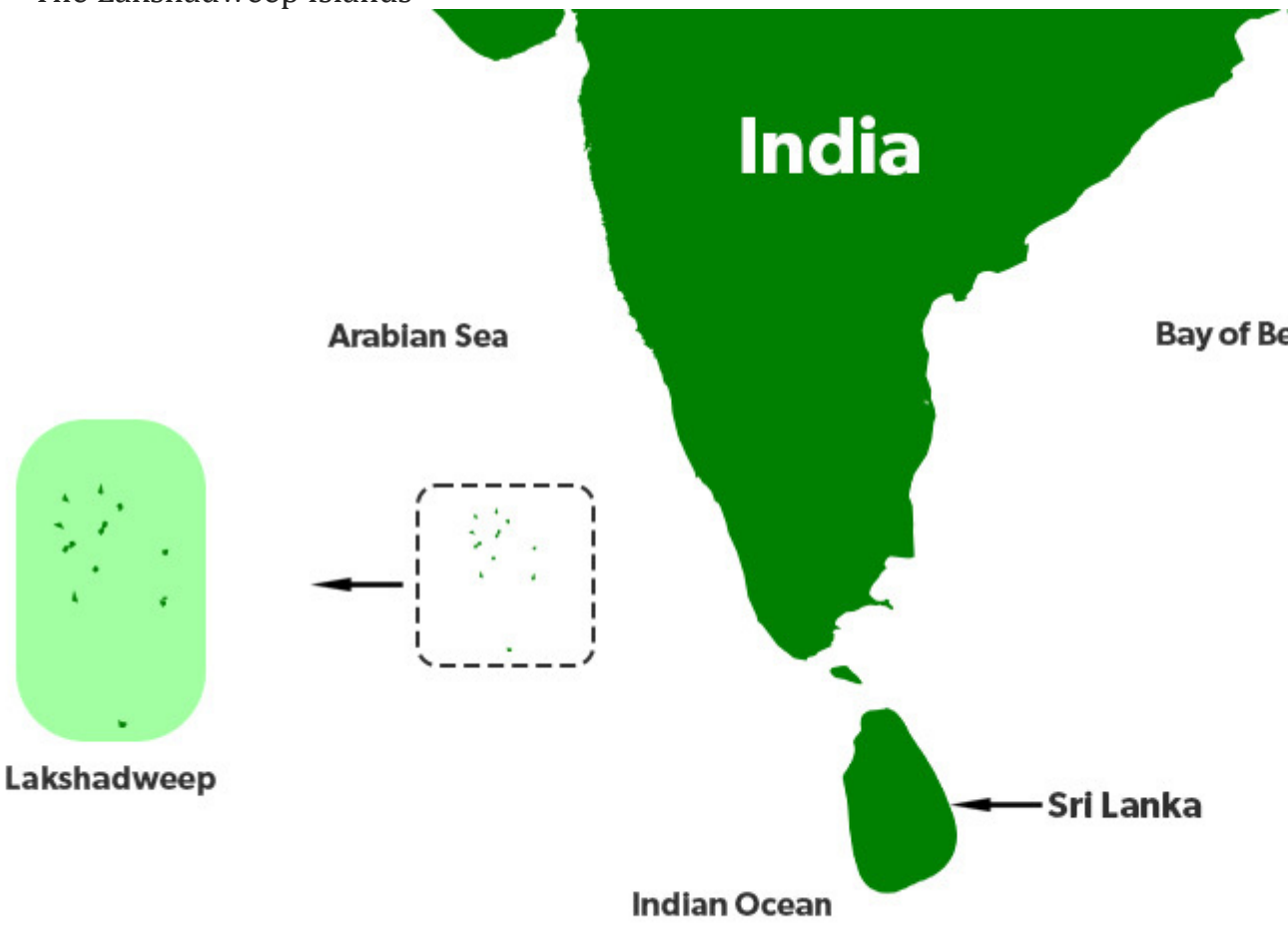


The Indian Islands

The **Indian Islands** or **the islands of India** refer to the **group of islands,** scattered across the Indian Ocean, the Arabian Sea, and the Bay of Bengal, which form parts of the territory of India. Together, they constitute one of the 5 physiographic divisions of India.

The Indian Islands or the Islands in India are, broadly, categorized into **two main groups** of islands:

- The Andaman and Nicobar Islands
- The Lakshadweep Islands



These diverse **physiographic divisions of India** highlight the diversity of the vast geography of our country. With their own unique physical features, climate,

vegetation, and soil types, each of the physiographic divisions of India contributes uniquely to the country's geographical diversity, cultural richness, and economic activities. Understanding these divisions is not only essential for sustainable development but also for better planning and management of its natural resources.

Mountain Ranges in India

The mountain ranges of India crisscross and overlap throughout the northern part of the country. But they are typically classified into seven distinct mountain ranges: **the Greater Himalaya Range**, **the Middle Himalaya Range**, **the Outer Himalaya Range**, **the Karakoram Range**, **the Western Ghats**, **the Eastern Ghats**, and **the Aravalli Range**.

Karakoram Range	A sub range of the Hindu Kush Himalayan Range K2, the second highest peak in the world is located here Famous Glaciers: Siachen Glacier, Biafo Glacier Karakoram range span the borders between Pakistan, India and China Located in the regions of Gilgit –Baltistan (Pakistan), Ladakh (India), and Xinjiang region (C

Ladakh Range	South-eastern extension of the **Karakoram Range** From the mouth of the **Shyok River** in Ladakh to the border with Tibet Extension of the Ladakh Range into China is known as **Kailash Range** Lies here India's cold desert named as 'LEH
Zaskar Range	Boundary line between Ladakh region of Kashmir & remaining two regions of the state i.e. Jammu region and Vale of Kashmir Highest peak Kamet (UK) Lies here Coldest place in India, Dras (The Gateway to Ladakh) Famous Passes: **Shipki, Lipu Lekh (Lipulieke),** and **Mana Pass**
Pirpanjal Range	Separates Jammu Hills to the south from the Vale of Kashmir (Kashmir Valley), beyond wh the Great Himalayas Highest Point: **Indrasan**, 2nd Highest: **Deo Tibbat** Has India's longest rail tunnel known as **Pir Panjal Railway** Tunnel, **Banihal road tunnel** Famous Passes: **Pir Panjal Pass, Banihal Pass**, **Rohtang pass**
Dhauladhar Range (White Range)	Spread in J & K and Himachal, with home to major hill stations like **Kullu**, **Manali** & **Shimla** Highest peak: **Hanuman ji Ka Tiba**, or **'White Mountain'**
Shivalik Range	Southernmost & outer Himalayas also known as ***Manak Parbat*** in ancient times, literally means **'tresses of Shiva'** About 2,400 km long from Indus till Brahmaputra, with a gap of about 90 kilometres betw Teesta and Raidak rivers in Assam known as **sub-Himalayas**.

Aravali Range	Means 'line of peaks', runs across Gujarat, Rajasthan, Haryana & Delhi, known as Mewar hill Highest Peak: Gurushikhar, Mt abu Famous passes: Pipli Ghat, Haldi Ghat Locally known as Mewar hills
Maikal Range	Eastern part of the Satpuras range (MP)
Kaimur Range	Eastern portion of the Vindhya Range in MP, UP & Bihar, Parallel to river son

Mahadeo Range	forms the central part of the Satpura Range, located in MP Highest peak: Dhoopgarh
Ajanta Range	Maharashtra, south of river Tapi, sheltering caves of world famous paintings of Gupta perio
Rajmahal Hills	In Jharkhand made up of lava basaltic rocks Point of Ganges bifurcation
Garo Khasi Jaintia Hills	Continuous Mountain range in Meghalaya
Mikir Hills	a group of hills located to the south of the Kaziranga National Park (Assam) a part of the Karbi Anglong Plateau
Abor Hills	Hills of Arunachal Pradesh, near the border with China, bordered by Mishmi and Miri Hills drained by Dibang River, a tributary of the Brahmaputra
Mishmi Hills	in Arunachal Pradesh with its northern & eastern parts touching China Situated at the junction of North-eastern Himalaya and Indo-Burma ranges.
Patkai Range	Also known as Purvanchal Range, consist of three major hills The Patkai-Bum, the Garo-Khas Jaintia and Lushai Hills situated on India's north-eastern border with Burma
Mizo Hills (Lushai Hills)	part of the Patkai range in Mizoram and partially in Tripura

Vindhya Range	a complex, discontinuous chain of mountain ridges, hill ranges, highlands & plateaus running thr Madhya Pradesh, Gujarat, Uttar Pradesh and Bihar Highest peak – Sadbhawna Shikhar

Satpura Range	a range of hills in central India Passes through Madhya Pradesh, Gujrat, Maharashtra, Chhattisgarh Highest peak: Dhupgarh
Dalma Hills	Located in Jamshedpur famous for Dalma national park & minerals like iron ore & manganese
Girnar Hills	Gujrat
Baba Budan Giri	Karnataka
Harishchandra	At Pune, acts as a water divide bw Godavari & Krishna Hills made up of lava
Balaghat range	Bw MP & Maharashtra, famous for manganese deposits
Chilpi series	MP

Talcher series	Odisha, rich in bituminous coal

Champion series	Karnataka, Dharawar period, rich in gold (contains kolar mines)
Nilgiri Hills	Referred as Blue mountains, a range of mountains in the western most part of Tamil Nadu at the junction of Karnataka and Kerala Hills are separated from the Karnataka plateau to the north by the Moyar River and from the **Anaimalai** Hills & Palni Hills to the south by the Palghat Gap
Palani Hills	Eastward extension of the Western Ghats ranges adjoin the high **Anamalai range** on the west, and extend east into the plains of Tamil Nadu
Anamalai Hills	Also known as **Elephant Hilla range** of mountains in the Western Ghats in Tamil Nadu and Kerala v highest peak Anamudi
Cardmom Hills	Part of the southern Western Ghats located in southeast Kerala and southwest Tamil Nadu
Pachamalai Hills	also known as the Pachais Eastern Ghats in Tamil Nadu

HIMALAYAN MOUNTAIN SYSTEM

The Himalayan Mountains are part of India's northern mountain range. They are the world's tallest mountain ranges. These mountain ranges begin at Pamir Knot in the west and continue to Purvanchal in the east.

The Himalayas are the result of the Indian and Eurasian plates colliding. Indian Peninsula split off from Gondwana during the Cretaceous Period and began moving north. Between the two plates, the Tethys was squeezed, creating a geosyncline.

The Indian Plate's oceanic boundary was subducted as the plate moved north, leaving some of these rocks in the Ladakh region.

The northward drift along with the Tethys sea compression caused the Himalayas to rise. The mountains continued to converge, creating fold mountains known as the Main Himalayas or Greater Himalayas, and south of them, the Main Central Thrust.

Eastern Himalayas were generated by the collision of the Indian and Eurasian plates 60 million years ago, which caused the construction of the Potwar plateau and an anticlockwise spin in the plate.

As the process continued, the Main Boundary Fault line developed south of the Lesser Himalayas. It is referred to as the Middle Himalayas.

Foredeep was formed on the foothills of the Greater and Lesser Himalayas, where deposition and subsequent compression resulted in the construction of the Shivalik Mountains and a new fault line emerged which came to be known as the Himalayan frontal line.

From the Indus gorge in the west to the Brahmaputra gorge in the east, the Himalayas stretch in an east-west pattern.

At these gorges, the Himalayan ranges make abrupt bends to the south. These bends are known as the Himalayan syntaxial bends.

The western syntaxial bend is located close to Nanga Parbat, where the Indus river has built a large gorge. The Namche Barwa is close to the eastern syntaxial bend.

The Himalayas is one of the three mountain ranges that constitute the Himalayan mountain range system. These were created by the tectonic collision of the Indian Plate and the Eurasian Plate. The Purvanchal Hills, Trans Himalayas, and Himalayas are the three Himalayan mountain ranges that constitute up the northern mountain chain.

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The Great Himalayas

It is also known as Himadri, the Central Himalayas, or the Inner Himalayas. The hogback topography—a long, steep hill or mountain ridge—is created by the asymmetrical folds in this range, which have a high south slope and a mild north slope.

Its typical height is 5000 kilometers. It has tall mountains and vast glacier snowfields and is mostly made up of crystal-rich igneous or metamorphic rocks.

Its core is comprised of Archean rocks, and there are very few gaps and antecedent rivers. The range is also continuous. It forms an arc from Nanga Parbat in the west to Namcha Barwa in the east.

Few of the current passes are Zojila and Brazil in Kashmir, Bara Lapcha La and Shipki La in Himachal Pradesh, Niti pass and Lipu lekh in Uttarakhand, and Nathula and Jelep La in Si.

Trans Himalayas

The Trans himalaya is a 1,600-kilometer (990 mi) long mountain range that runs parallel to the main Himalayan range in a west-to-east orientation. It is

on the southern edge of the Tibetan Plateau, north of the Yarlung Tsangpo river.

The Trans-Himalayas is mostly made up of granite and volcanic materials. The mountains lack a clear alignment and are not split by large river gorges like the main Himalayas.

The Great Karakoram Range, also known as the Krishnagiri Range, is the northernmost range of the Trans-Himalayan Ranges in India.

The Karakoram Range stretches around 800 kilometers east of the Pamir. It is a mountain range with high peaks (elevations of 5,500 m or more). Some of the largest glaciers in the world outside of the polar regions call this place home.

The second-highest peak in the globe and the highest mountain in the Indian Union is K2.

The Ladakh Plateau is located to the northeast of the Karakoram Range. It is divided into several plains and mountains.

Lesser Himalayas

The Greater Himalayas in the north and the Shiwaliks in the south have a nearly parallel alignment with both ranges.

Its typical height ranges from 1300 to 5000 kilometers. Typically, it is made up of crystalline sediments.

While the arrangement is considerably distinct and reflects very heavily folded and complex structures, its lithology is identical to the Main Himalayas.

Dhauladhar, Pirpanjal, Nagatibba, Mussorie, and Mahabharat ranges are significant ranges. While northern slopes are rocky, southern slopes are steep. Small pastures known as Merg can be found on slopes.

The Mussoorie and Nag Tibba ranges in Uttarakhand serve as landmarks for the Middle Himalayas.

Human contact is easier in the Middle Himalayan ranges.

The lower Himalayas are represented by the Sapt Kosi, Sikkim, Bhutan, Miri, Abor, and Mishmi hills east of the Kosi River. The Mahabharat Lekh, in southern Nepal, is a continuation of the Mussoorie Range.

This region is the location of the majority of Himalayan hill resorts, including Shimla, Mussoorie, Ranikhet, Nainital, Almora, and Darjeeling, among others.

Shivalik

This range, which is not continuous, is also known as the outer Himalayas. It looks like a hogback and its slopes are more steep in the south.

There are valleys in the north called Doon in the west and Duar in the east. They go by the name Dehradun.

Mostly fossiliferous sedimentary rocks, such as sandstone, sand rocks, clay, conglomerate, and limestone, constitute this zone.

Thick trees cover the Shiwalik range from North-East India to Nepal, but as you move west from Nepal, the amount of forest cover reduces. The quantum of rainfall decreases from east to west in Shiwaliks and Ganga Plains.

Nearly no trees cover the southern slopes of the Shiwalik mountain in Punjab and Himachal Pradesh. Seasonal torrents are known as Chos deeply slash these slopes. The hills belong to antisynclines or anticlines, while valleys belong to synclines.

Shiwalik Hills were created by the conglomerate's accumulation. During the first stages of deposition, these conglomerates created transient lakes.

These transient lakes gathered an increasing amount of conglomerates over time. At the bottom of the lakes, the aggregates were firmly established.

Conglomerate-filled lakes were drained away when rivers were able to cut through them, leaving behind plains known as "duns" or "doons" in the west and "duars" in the east. The best illustration is Dehra Dun in Uttarakhand.

Purvanchal or Eastern Himalayas

The Himalayas' southern extension, known as the Eastern Hills or The Purvanchal, runs along India's northeastern border.

The Purvanchal is a group of relatively low hills that are formed when the Himalayas abruptly curve southward near the Dihang canyon.

They stretch from Arunachal Pradesh in the north to Mizoram in the south along the border between India and Myanmar.

Significance

It is a heaven for naturalists because of the incredible variety of plants and animals, which is brought about by the general temperature changes as one ascends higher.

Deodars, azaleas, pines, firs, tigers, snow leopards, sparrows, cormorants, snow partridges, snow cocks, and snow pigeons are just a few of the plants and animals that alter with elevation and temperature.

The Himalayas have protected India from foreign incursions as a protective barrier since ancient times.

India's climate is significantly impacted by the Himalayas. The summer monsoons from the Arabian Sea and Bay of Bengal are successfully deflected by them.

The Himalayan mountains are the source of almost all of India's major rivers. Ample rainfall serves as the food source for India's powerful river

DECCAN PLATEAUS

The geography of India is extremely diverse, with landscapes ranging from snow-capped mountain ranges to deserts, plains, hills and plateaus. In the southern part of Peninsular India, there is a diverse area named the Deccan Plateau. Read more about the Deccan Plateau here.

A plateau is a landform that is flat, tall, and significantly rises above its surroundings on at least one side.

Typically, plateaus are created when magma from a deep part of the earth rises up towards the surface but is unable to penetrate the crust.

Because of this, the magma ultimately lifts a huge, impermeable rock above it. The formation of these plateaus took millions of years.

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What is Deccan Plateau?

The Deccan Plateau is a large plateau in western and southern India. It covers an area of 500,000 square kilometres and extends over eight Indian states.

The word “Deccan” comes from the Sanskrit word Dakshina, meaning “south”.

The Deccan Plateau lies between the Western and Eastern Ghats and is informally described as the peninsular territory south of the Narmada River between these mountains.

It is volcanic in origin, made up of horizontal layers of solidified lava forming a trap structure with a step-like appearance.

The sedimentary layers are also found in between the layers of solidified lava, making it inter–trapping in structure.

Features of the Deccan Plateau:

The Deccan Plateau: Geography

- The Deccan Plateau is a large, flat expanse of land. It covers an area of over 500,000 square kilometres (200,000 square miles). It rises to 1000 m in the south but dips to 500 m in the north.
- The Deccan Plateau is triangular in shape and is bounded by the Satpura and Vindhya mountain ranges to the north, the Western Ghats to the west, and the Bay of Bengal to the east.
- The average elevation of the plateau is 600 metres above sea level. The highest point is Doddabetta Peak in Tamil Nadu, which rises to 2637 metres.

The Deccan Plateau: Rivers

- Its general slope is from west to east which is indicated by the flow of its major rivers. Rivers have further subdivided this plateau into a number of smaller plateaus. The majority of the rivers on the Deccan plateau flow south.
- The Godavari River, which flows southeast, the Krishna River**,** which splits the peninsula into two parts, and the Pennai Aaru River**,** which flows north, all drain the plateau.
- The Godavari River and its tributaries, notably the Indravati River, drain much of the northern half of the plateau, beginning in the Western Ghats and going east to the Bay of Bengal.
- The Tungabhadra River, Krishna River, and its tributaries, notably the Bhima River, drain the majority of the central plateau.
- The Kaveri River rises in Karnataka's Western Ghats and bends south to break through the Nilgiri Hills at the island town of Shivanasamudra.
- Then flows into Tamil Nadu at Hogenakkal Falls before flowing into the Stanley Reservoir and the Mettur Dam that created the reservoir, and finally emptying into the Bay of Bengal, which drains the southernmost part of the plateau.
- Moist deciduous, dry deciduous, and tropical thorn woods cover the plateau.

The Deccan Plateau: Climate

- The Deccan Plateau has a tropical climate. The summers are hot and dry, while the winters are milder and drier. The plateau experiences very little rainfall, averaging only about 600 millimetres (24 inches) per year.
- The climate of the Deccan Plateau varies from tropical in the lower regions to temperate in the higher regions. The rainfall also varies from region to region, depending on the monsoon winds.
- The driest areas include Rayalaseema and Vidarbha. Rain falls from June through October during the monsoon season.
- The months of March through June may be extremely dry and hot, with temperatures often topping 35 degrees Celsius.
- The climate on the plateau is drier than on the beaches, and it can be dry in some areas.
- Although the term Deccan is frequently used to refer to all of India south of the Narmada River, it refers to a region in the northern half of the peninsula with rich volcanic soils and lava-covered plateaus between the Narmada and Krishna rivers.

The Deccan Plateau: Population

- The Deccan Plateau has a population of over 200 million people. The majority of the population is Hindu, with sizable minority populations of Muslims and Christians. Telugu is the most widely spoken language on the plateau, followed by Marathi and Kannada.
- The Deccan Plateau is home to a large number of Indian tribes and languages.
- The major tribes are the Gonds, Bhils, Kols, Santhals, and Munda.
- Bhil and Gond people reside in the hills of the plateau's northern and northeastern boundaries, speaking languages from both the Indo-Aryan and Dravidian families.
- The plateau's huge expanses of residual forest are still home to a variety of grazing species, including the four-horned antelope chinkara and blackbuck, as well as the gaur and wild water buffalo.
- The plateau is home to a variety of animal species, including the Bengal tiger, Indian leopard, Asiatic elephant, and sloth bear.

The Deccan Plateau: Economy

- The Deccan Plateau is home to many industries, including mining, steel production, textiles, and chemicals. Agriculture is also an important part of the economy, with crops such as cereals, oilseeds and pulses (legumes) being grown on the plateau.
- The Deccan Plateau is rich in mineral resources. Coal, iron ore, manganese, mica, bauxite, copper, limestone, and chromite are found in abundance here.
- Agriculture is the main occupation of the people living on the plateau.
- Cotton textiles, sugar, foodstuffs, tobacco, paper, machine tools, and medicines are produced at industries located in Hyderabad, Warangal, and Kurnool.
- Forest-based cottage businesses (timber, firewood, charcoal, bamboo goods) and mineral-based cottage industries (asbestos, coal, chromite, iron ore, mica, and kyanite).
- Livestock rearing is also an important economic activity.

The Deccan Plateau: Tourism

- The Deccan Plateau has a rich cultural heritage.
- The Deccan Plateau is home to several historical sites, including the **Ajanta and Ellora caves**, as well as the temples at Hampi.
- The city of Hyderabad is also a popular tourist destination, with its Charminar monument and Hussain Sagar Lake.

Ecological structure of the Deccan Plateau:

The general meaning of geologic structure is the study of the distribution and types of rock on the surface and inside the surface. Geogolicaly structurally, the Deccan plateau can be divided into the following parts.

Archaean Rock (4.5 Billion to 2.5 Billion years)

- Archaean rocks are first formed on the earth and it is the oldest rock and has no sign of fossil.
- Archean rocks are found in Kerala, Tamil Nadu, Andhra Pradesh, and Telangana.

Dharwar Rocks (2.5 Billion to 1.8 Billion years)

- It is the earliest sedimentary rock.
- It is mainly found in Karnataka in the Deccan plateau.
- The presence of Dharwar rocks is also present in Madhya Pradesh, Jharkhand, Aravali, and Meghalaya.

Cuddapha Rocks (1.8 Billion to 540 million years)

It is mainly found in the Nallamalai hills of Andhra Pradesh and Telangana.

Gondwana Rocks (400 Million to 200 Million years)

- About 98 % of Indian rocks are found in Gondwana rocks.
- It spreads in the Mahanadi and Godawari regions of the Deccan plateau.
- It is also found in Chhotanagpur and Meghalaya plateau.

Deccan Trap (80 to 66 Million years)

- It is a basaltic volcanic origin.
- It spreads in Maharashtra, Gujarat, Madhya Pradesh, Karnataka, and Telangana.

Significance of Deccan Plateau:

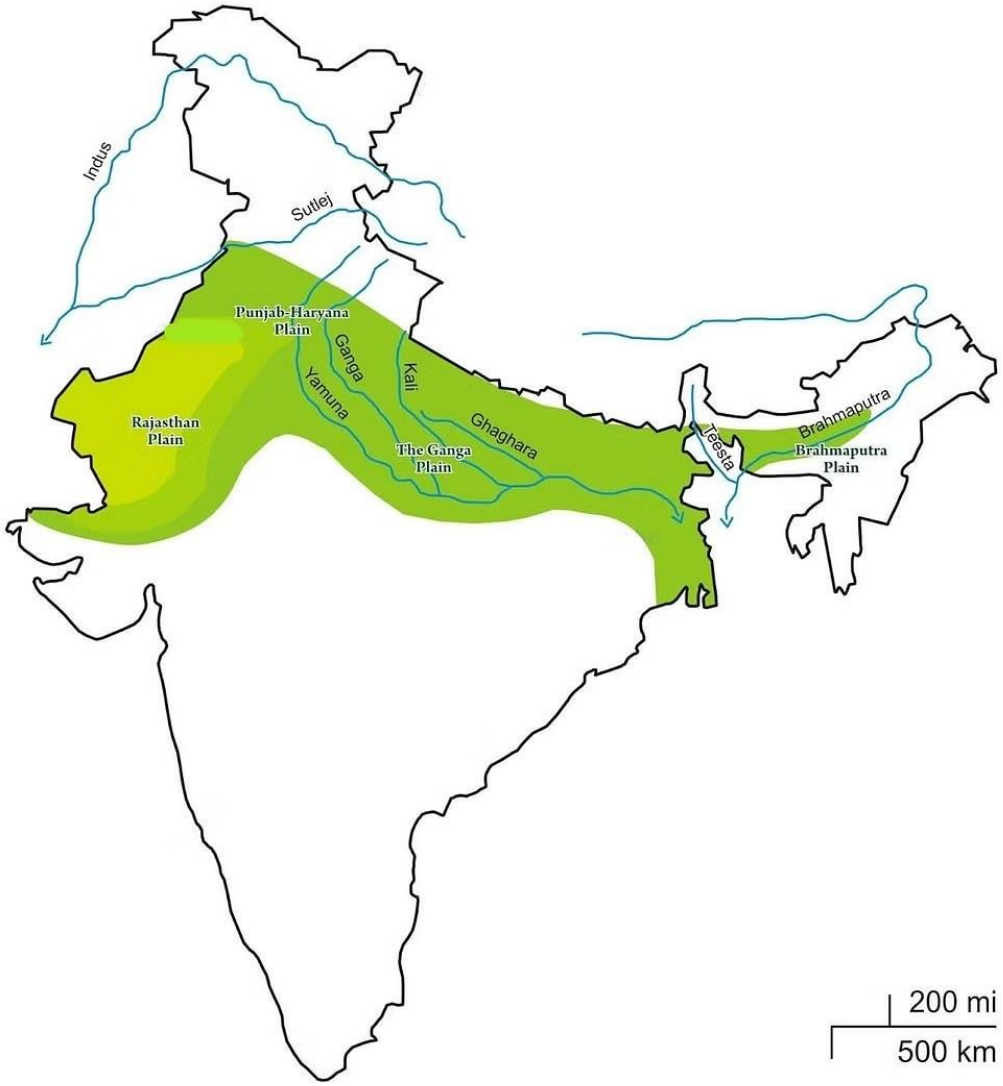
- Minerals and precious stones abound on the Deccan level.
- Numerous marsh kings, especially those of the Mauryan (fourth second century BCE) and Gupta (fourth sixth century CE), fought for the level's mineral wealth.
- Coal, iron metal, asbestos, chromite, mica, and kyanite are among the significant minerals identified here.
- Low precipitation made agriculture difficult until the water system was introduced. At the moment, the zone under development is quite low, ranging from 60% in Maharashtra to roughly 10% in the Western Ghats.
- Rice is the most important crop in high-precipitation areas, whereas sorghum is the most important crop in low-precipitation areas.
- Cotton, tobacco, oilseeds, and sugar sticks are examples of massive crops.
- Espresso, tea, coconuts, areca, pepper, elastic, cashew nuts, custard, and cardamom are all widely grown on ranches in the Nilgiri Hills and the Western Ghats.

THE GREAT PLAINS OF INDIA

Stretching from the foothills of the Himalayas to the Bay of Bengal, ***the Indo-Gangetic Plains****, also known as* ***the Great Plains of North India****, is a vast and fertile landscape. These plains, formed by millennia of sediment deposits from the mighty Indus, Ganges, and Brahmaputra river systems, hold immense significance for the subcontinent's cultural, economic, and ecological well-being.*

About the Indo-Gangetic Plains

The Indo-Gangetic Plains, also known as the **Indo-Gangetic-Brahmaputra Plains** or **the Great Plains of North India**, refer to an **aggradational plain** formed by the **alluvial deposits** carried by the three rivers – **Indus, Ganga, Brahmaputra**, and their tributaries. It constitutes one of the 5 physiographic divisions of India. Along with being the youngest physiographic feature of India, it also holds the distinction of being the largest alluvial plain in the world.

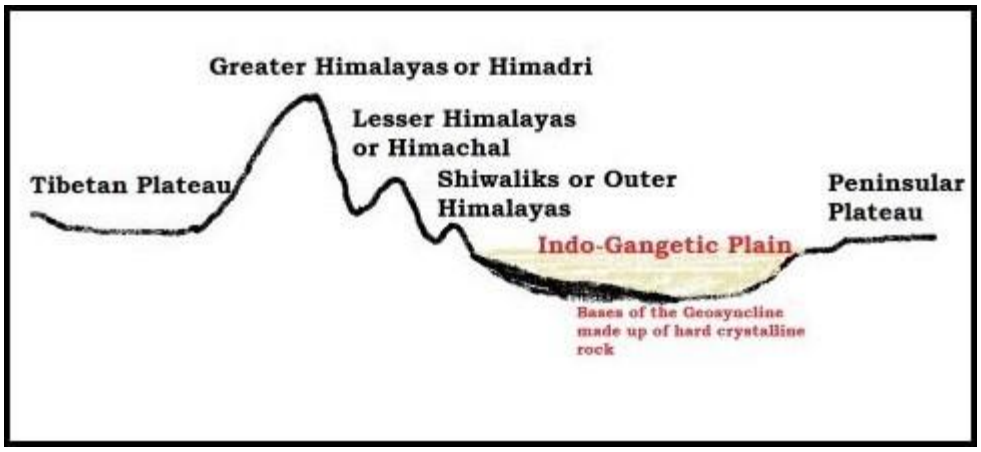


Features of the Indo-Gangetic Plains

North-South Extension	They extend from the **south of the Himalayas upto the edge of the Peninsular Plateau.**
East-West Extension	They extend from the **mouth of the Indus in the west** to the mouth of the Ganga in the east.
Boundaries	They are bounded by the **Shiwalik range to the north, the Desert to the west,** the **Peninsular Plateau to the south,** and the **Puruvachal Hills to the east.**
Length	The total length of this tract is **3200 km**, of which around **2400 km** lies **in India** and the rest lies in Bangladesh.

Width	The average width of the Great Northern Plains is 150-300 km. They are widest in the west where their width goes up to 500 km, and narrow down towards the east where their width shrinks down to 60-100 km.
Area	They occupy an area of around **7.8 lakh sq. km**, making it **the largest alluvial plain in the world.**
States Covered	The Great Northern Plains of India spread over the states – Punjab, Haryana, Delhi, Uttar Pradesh, Bihar, parts of Jharkhand and West Bengal, and Assam.
Extreme Horizontality	Extreme horizontality is an important feature of this plain. With an average elevation of around 200 m and the highest elevation of about 291 m above the mean sea level, its average gradient range is just 15-20 cm.
Soil Cover	The rivers coming from the northern mountain carry a huge load of sediments which get deposited over these plains. Thus, these plains have a rich and fertile soil cover.

Formation of the Indo-Gangetic Plains



These plains have been formed by the **depositional works of the three major river systems – Indus, Ganga, and Brahmaputra.** The sediments of these rivers filled the wide depression that existed between the Peninsular and Himalayan regions.

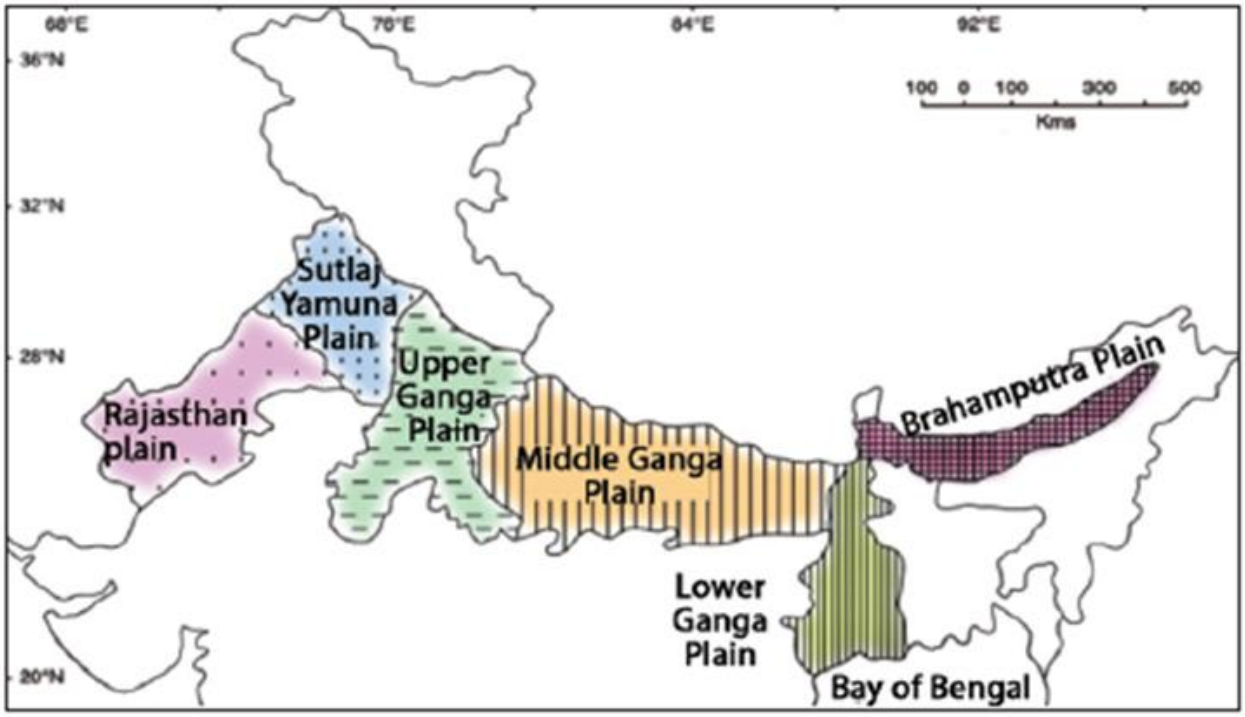
In the Tertiary Period, the movement of the Indo-Australian Plate towards the Eurasian Plate led to the formation of the Himalayas. The continued convergence

of these two tectonic plates led to upheaval in the Himalayas and created a deep depression between the Peninsula and the Himalayas in the form of a large syncline. Rivers flowing down from the Himalayas brought along a lot of sediments, depositing them in the deep depression. This resulted in the formation of the Indo-Gangetic Plains or the Great Plains of India.

Regional Divisions of the Indo-Gangetic Plains

Regionally, the Indo-Gangetic Plains are classified into 4 major divisions:

1. **The Rajasthan Plain**
2. **The Punjab-Haryana Plain**
3. **The Ganga Plain**
4. **The Brahmaputra Plain**



The Rajasthan Plain

- This region forms the **western extremities** of **the Indo-Gangetic Plains**.

- It consists of the Thar or Great Indian Desert covering western Rajasthan and adjoining areas in Pakistan.
- The Rajasthan Plain can be divided into two parts:

Marusthali

- The eastern part of the Rajasthan Plain, which is a proper desert, is known as Marusthali.
- It covers a great part of the Marwar plain.
- Although it looks like an aggradational plain on the surface, geologically it is a part of the Peninsular Plateau. The same is proved by the fact that it has a vast stretch of sand with few outcrops of bedrock of **gneisses, schists, and granites.**
- Its **eastern part is rocky**, while the **western part** is covered by shifting sand dunes locally known as **Dhrian**.

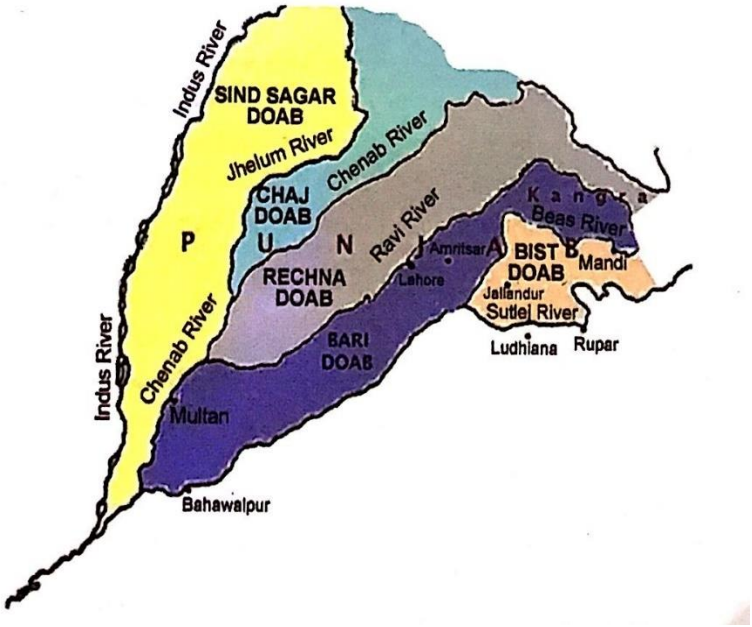
Rajasthan Bagar

- The eastern part of the Thar desert upto the Aravalli Range is a semi-arid plain which is known as Rajasthan Bagar.
- Numerous short seasonal streams originating from the Aravali drain this area and form patches of fertile tracts, called Rohi.
- The river **Luni** is an example of such a stream that flows southwest of Aravalli and drains into the Rann of Kutch.
    - The tract north of the Luni is called **Thali** or sandy plain.
- The Thar desert also has several saline lakes like Sambhar, Didwana, Khatu, etc.

The Punjab-Haryana Plain

- It lies towards the east and north-east of the Rajasthan Plain.
- The entire plain extends for a **length of 640 km** in the **northwest to southeast** direction in the states of **Punjab** and **Haryana**.
- Its average width is 300 km.
- The plain slopes gently down towards the south-west. Hence the rivers in this region flow in the same direction.
- The plain is mostly made of silts and hence the soil is porous.

    - The part of the plain near the river banks, formed by the deposition of new alluvium, is called **Bet**.
    - The foot-hill regions of the plain, made up of large boulders, gravel, sand, and clay, are known as the **'Bhabar' Plain**. (This soil cannot hold water).
- In Haryana, it is bounded in the east by the Yamuna River.
- The Punjab part of this plain is formed as a **result of alluvial deposits of five rivers** – Satluj, the Beas, the Ravi, the Chenab, and the Jhelum.
    - That's why the Punjab Plain is also called the **'Land of Five Rivers'**.
- The **Punjab part** of this plain is primarily made up of the **5 'Doabs'** (tract of land lying between two confluent rivers), which from east to west are as follows:
    - **Bist-Jalandhar Doab** lying between the **Beas** and the **Satluj**.
    - **Bari Doab** lying between the **Beas** and the **Ravi**.
    - **Rachna Doab** lying between the **Ravi** and the **Chenab**.
    - **Chaj Doab** lying between the **Chenab** and the **Jhelum**.
    - **Sind Sagar Doab** lying between the **Jhelum**-Chenab and the **Indus**.



- Some **important features** of the Punjab-Haryana Plain can be seen as follows:
    - **Bet Lands:** These are **Khadar-rich floodplains**, wherein fertile soils are deposited annually, making them very fertile.

    - **Dhayas:** These are **broad flood plains of Khadar** flanked by bluffs.
    - **Chos:** The northern part of this plain adjoining the Shiwalik hills has been heavily **eroded by numerous streams**, which are called Chhos.

The Ganga Plain

- It is the **largest unit** of the Indo-Gangetic Plains with an **area of 3.75 lakh sq. km**.
- This plain is **formed by the alluvial deposition** of the Ganga along with its Himalayan as well as Peninsular tributaries.
- It extends from **Delhi to Kolkata** in the states of Uttar Pradesh, Bihar, and West Bengal.
- The **general slope** of the entire plain is **to the east and southeast**.
- Depending upon geographical variations, the Ganga Plain has been subdivided into **three divisions**:

The Upper Ganga Plain

- **Location:** Forms the westernmost and the upper part of the Ganga Plain.
- **Boundaries:** The Shiwaliks in the north, the Peninsular boundary in the south, and the Yamuna River in the west. Its eastern boundary remains obscure.
- **Average Gradient:** about 25 cm per km.
- **Important Features:** Because of the very low gradient, the rivers flow sluggishly in the plain. This leads to the formation of riverine features such as river bluffs, river meanders, oxbow lakes, levees, abandoned river courses, sandy stretches (Bhurs), etc.
- **Major Units (west to east):** Ganga-Yamuna Doab, Rohilkhand Plains, and Avadh Plains.

The Middle Ganga Plain

- **Location:** It lies to the east of the Upper Ganga Plain, spreading over the eastern part of Uttar Pradesh and Bihar.

- **Boundaries:** The Himalayan foothills in the north, and the Peninsular edge in the southern boundary. Its western as well as eastern boundaries remain obscure.
- **Important Features:** Because of the very low gradient in the region, rivers flow sluggishly in this flat land. As a result, the area is marked by riverine features such as levees, bluffs, oxbow lakes, marshes, tals, ravines, etc.
    - Almost all the **rivers** in this region keep on **shifting their courses**, making the area prone to **flood. Kosi** is particularly notorious for this, and is called the **'Sorrow of Bihar'**.
- **Major Units (west to east):** Ganga-Ghaghara Doab, Ghaghara-Gandak Doab, and Gandak-Kosi Doab (Mithila Plain).

The Lower Ganga Plain

- **Location:** It lies to the east of the Middle Ganga Plain, spreading over the eastern part of Bihar, the whole of Bengal, and most parts of Bangladesh.
- **Boundaries:** The Darjeeling Himalaya in the north; the Bay of Bengal in the south; the Chotanagpur Highlands in the west; and the Bangladesh border in the east.
- **Important Features:** The most prominent feature of this region is delta formation, which accounts for around 2/3rd of this part of the plain.
    - The Ganga, along with the Brahmaputra, forms **the largest delta of the world** on the coastal side of this plain. The delta, called the **Ganga-Brahmaputra Delta**, is known for Mangroves and Royal Bengal Tiger.

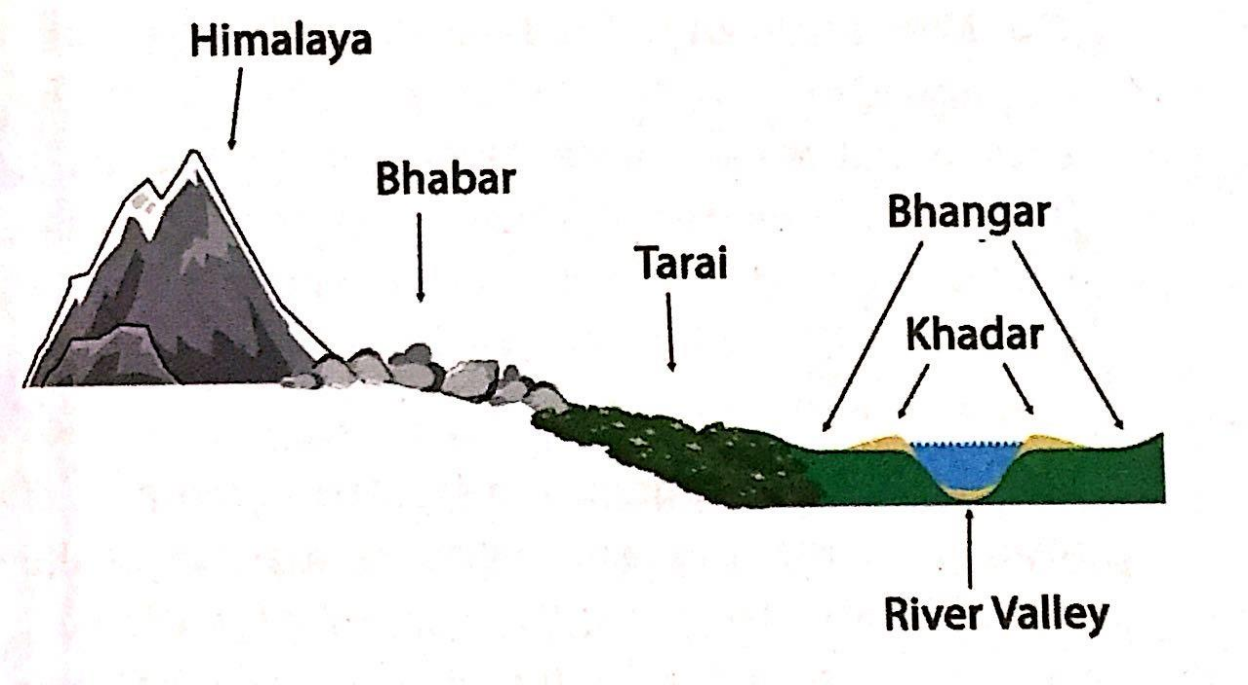
The Brahmaputra Plain

- It lies in the **northeastern part** of the country.
- It is also known as **Brahmaputra Valley or Assam Valley or Assam Plain**.
- Although it is often treated as the eastward continuation of the Ganga Plain, it is, actually, a well-demarcated separate physical unit.
- It is surrounded by the **Eastern Himalayas of Arunachal Pradesh** in the north, **Patkai Bum** and **Naga Hills** in the east, the **Garo-Khasi-Jaintia** and **Mikir Hills** in the south, and Indo-Bangladesh border and lower Ganga Plain boundary in the west.

- Similar to the Ganga Plain, this is also an **aggradational plain** built up by the depositional work of River Brahmaputra and its tributaries.
- The tributaries of Brahmaputra flowing down from the north debouch abruptly in this valley. This leads to the formation of several riverine **features** such as **alluvial fans, sandbars, river meanderers, oxbow lakes,** etc.
    - **Majuli Island**, formed by the Brahmaputra, is **the largest riverine island in the world**.
- The Brahmaputra Valley is famous for its **tea plantations**.

Geomorphology of the Indo-Gangetic Plains

Some of the distinctive geomorphological features of the Indo-Gangetic Plains can be seen as follows:



The Bhabar

- It is a **narrow belt of about 8-16 km** width stretching in an east-west direction as the northern boundary of the Great Northern Plains.
- It runs along the foothills of the Shiwaliks from the River Indus to the River Tista.

- This belt consists of **alluvial fans** which are formed by the deposition of **unassorted sediments** in the form of **gravel** and **pebble-studded rocks**.
- Because of the porous nature of the sediments in this region, **water streams sink and flow underground**. Hence, this area has **dry river courses** except in the rainy season.

The Tarai

- It lies to the **south of the Bhabhar** region and runs parallel to it.
- Its **width** ranges from **15-30 km**.
- The streams that flow underground in the Bhabhar region emerge in this region leading to the formation of **marshy and damp tracts of land**.
- It is composed of **comparatively finer alluvium** and is covered by forests.
- Most parts of the Tarai area have been converted into agricultural land, especially in the states of Punjab, Uttar Pradesh, Uttarakhand, etc.

The Khadar

- This belt forms the **flood plain along the river banks**.
- The **newer alluvium** brought by the rivers every year gets deposited along this belt. This makes this region **very fertile**.
- The **absence of calcareous deposits** in this region makes it very suitable for extensive cultivation.

The Bhangar (or Bangar)

- It refers to the **alluvial terrace** formed above the level of the flood plain.
- It is the **largest part of the Indo-Gangetic Plains**.
- Soil in this region is made up of **older alluvium** and is **not renewed frequently**. Thus, this region is **not very fertile**.
- It consists of **calcareous deposits**, locally known as **Kankar**.

Reh or Kallar

- They refer to **barren saline efflorescences** of the dry regions in Uttar Pradesh and Haryana.

Bhur

- These are the **elevated pieces of land** that have been formed along the Ganga river banks due to **wind-blown sand accumulation** in the hot and dry months.

Significance of the Indo-Gangetic Plains

- **Home to a Large Population**: The plains constitute less than one-third of the total area of the country but support over 40 percent of the total population of the country.
- **Agriculture**: Fertile alluvial soils, flat surfaces, slow-moving perennial rivers, and favorable climate facilitate intense agricultural activity in this region. For the same reason, the northern plains are called the *granary of the nation.*
- **Roads and Railways**: The region has a wide network of roads and railways because of the easy typography. This has led to wide **urbanization and industrialization** in this region.
- **Religious Significance**: The region holds religious significance because of the presence of several **religious places along the banks** of sacred rivers like the Ganga and Yamuna.

Much more than just a geographical feature, **the Indo-Gangetic Plains or the Great Plains of India** has been the cradle of Indian civilization. These fertile plains have been nurturing the Indian population for centuries. Of late, this region has been facing some threats such as declining fertility, water scarcity, population explosion, etc. Ensuring the sustainability of the Great Northern Plains of India is not just crucial for the subcontinent but for the ecological and cultural heritage of the entire planet. **Sustainable development** is the way forward.

LAKES OF INDIA

India is known for its diverse natural resources. There are many resources out of which water bodies have a significant hold on the scenic beauty of our country. Lakes are one of the major sources of natural beauty in India and there are many lakes in almost every state.

This topic holds great significance for and various government exams in India. Important Lakes of India falls under static GK in the exam, you can check more articles on other static GK topics on the linked page.

Lakes can be classified into various categories:

S.No	Category of Lake in India
1.	Freshwater Lakes

2.	Saltwater Lakes
3.	Natural Lakes
4.	Oxbow Lakes
5.	Artificial Lakes
6.	Crater Lakes

Top 10 largest Lakes in India

The list of largest lakes is mentioned in the table below:

List of largest Lakes(Decreasing order of area covered)	State/UT
Vembanad Lake	Kerala
Chilika Lake	Odisha
Shivaji Sagar Lake	Maharashtra
Indira Sagar lake	Madhya Pradesh
Pangong Lake	Ladakh
Pulicat Lake	Andhra Pradesh
Sardar Sarovar Lake	Gujarat
Nagarjuna Sagar Lake	Telangana
Loktak Lake	Manipur
Wular lake	Jammu and Kashmir

List of Important Lakes in India

The list of important lakes in India is given below:

Lakes in India	State/UT
Pulicat lake	Andhra Pradesh
Kolleru Lake	Andhra Pradesh
Haflong Lake	Assam
Deepor Beel	Assam
Chandubi Lake	Assam
Kanwar lake	Bihar
Hamirsar Lake	Gujarat
Kankaria Lake	Gujarat
Badkhal Lake	Haryana
Brahma Sarovar	Haryana
Chandra Taal	Himachal Pradesh
MaharanaPratap Sagar	Himachal Pradesh
Dal Lake	Jammu Kashmir
Wular Lake	Jammu Kashmir
Agara Lake	Karnataka
Ulsoor Lake	Karnataka
Kuttanad Lake	Kerala
Sasthamkotta	Kerala
Bhojtal	Madhya Pradesh
Shivsagar	Maharashtra

Loktak lake	Manipur
Umiam Lake	Meghalaya
Tam Dil	Mizoram
Chilika Lake	Odisha
Harike	Punjab
Kanjli	Punjab
Sambhar Lake	Rajasthan
Tsomgo Lake	Sikkim
Chembarambakkam	Tamil Nadu
Hussain Sagar	Telangana
Govind Bhallabh Pant Sagar	Uttar Pradesh
Belasagar	Uttar Pradesh
Bhimtal	Uttarakhand
Kaliveli	Tamil Nadu

Lakes in India – Application

Apart from being a symbol of natural beauty, lakes can be of many uses for the inhabitants.

Lakes in India are a great source of :

- Irrigation
- Drinking-Water
- Navigation
- Livelihood

Important Facts about Lakes for Prelims

1. **Wular lake** is one of the biggest freshwater lakes in Asia and it was formed as a result of tectonic activity.

2. **Chilika Lake** in Odisha is the largest saline water lake in India.
3. **Vembanad Lake** in Kerala is the longest lake in India.
4. **Cholamu Lake** in Sikkim is the highest lake in India.
5. **Lonar Lake** is a notified National Geo-heritage Monument, saline, soda lake, located at Lonar in Buldhana district, Maharashtra.

GLACIERS IN INDIA

Glaciers in India are bodies of dense ice that flow under their own weight.

They are formed as a result of snow accumulation, which compresses them into a denser ice mass. India has a vast number of glaciers.

According to the Space Applications Centre of the Indian Space Research Organization (ISRO), India has 16,627 glaciers. The Himalayan region, in particular, boasts some of the world's most prominent glaciers.

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Glaciers

Glaciers are masses of ice that move under their own weight. It originates in regions where snow accumulation exceeds ablation over many years. They are sensitive markers of climate change.

They are commonly observed in snow fields. This greatest freshwater basin encompasses over 10% of the Earth's land surface. Glaciers contain 2.1% of all water on Earth, while the oceans and inland seas contain 97.2%.

Condition of glacier formation

- The average annual temperature is close to freezing.
- Winter precipitation causes significant snow accumulations.

- Temperatures during the remainder of the year do not result in the entire removal of snow accumulation from the previous winter.
- Temperatures during the remainder of the year do not result in the entire removal of snow accumulation from the previous winter.
- The glacier can be classified as a Mountain Glacier (Alpine Glacier) or a Continental Glacier based on its topography and position (Ice Sheets).
- The Mountain Glacier goes from a higher to a lower height, whereas the Continental Glacier flows in all directions.

Alpine Glaciers

- Alpine glaciers occur on steep slopes and usually travel southward via valleys.
- An alpine glacier can sometimes deepen valleys by pushing away debris, soil, and other things.
- These glaciers can be found in the highest elevations.

Ice sheets

- Ice sheets typically create huge domes that extend out in all directions.
- When ice sheets spread, they cover all areas with a thick layer of ice, including valleys, plains, and mountains.
- The continental glaciers are the largest ice sheets, covering most of Antarctica and the Greenland islands.

Glaciers in India

The majority of glaciers on the Indian map may be found in Himachal Pradesh, Sikkim, Uttarakhand, and the Union Territory of Ladakh. Arunachal Pradesh has a few glaciers as well. Some of India's glaciers are as small as football fields, while others stretch for hundreds of kilometres.

Also Read: Erosion and Deposition: Action of Wind and Waves – Clear IAS

Himalayan glaciers

The Himalayas have around 15,000 glaciers. The Himalayas cover an area of around five lakh square kilometers (the Area of India is nearly 32 lakh sq km). Snow has blanketed an area of around 33,000 square kilometers.

The snow line (the lowest level of perpetual snow) varies across the Himalayas based on latitude, precipitation, and topography.

- **The Karakoram Range's glaciers**: The Karakoram range has the most glacier development.
  This range has some of the greatest glaciers found outside of the polar and sub-polar areas. Several massive glaciers can be seen on the range's southern flank. The 75-kilometer-long Siachen Glacier in Nubra Valley is the world's second-largest glacier outside of the polar and sub-polar areas. The Fedchenko Glacier (Pamirs) is the largest, measuring 77 kilometers in length. The Hispar Glacier is the third largest. It is 62 kilometers long and is located on a branch of the Hunza River.
- **Glaciers of the Pir Panjal Range**: The glaciers of the Pir Panjal Range are fewer and smaller in size than those of the Karakoram Range. The longest Sonapani Glacier in the Lahul and Spiti region is only 15 kilometers long.
- **Kumaon-Garhwal Region Glaciers**: The Gangotri Glacier, which is the source of the holy Ganga, is the largest in the Kumaon-Garhwal area of the Himalayas.
- **Glaciers of Central Nepal**: The major glaciers in Central Nepal are the Zemu and Kanchenjunga glaciers.

Major Glaciers in India

Major Glaciers in India like Gangotri Glacier, Siachen Glacier, Hispar, etc. are discussed below.

Gangotri Glacier

- Uttarakhand's largest glacier.
- The Ganges' headwaters (Bhagirathi River)
- The Gangotri glacier flows from the northern slope of the Chaukhamba group of peaks in the Garhwal Himalayas.
- Gangotri is a conglomeration of glaciers rather than a single valley glacier.

Siachen Glacier

- Siachen Glacier, located in the Nubra Valley above the Karakoram Mountains, is the second largest glacier outside of the polar and sub-polar areas.
- Its primary tributaries are Lolofond and Teram Shehr.

- India and Pakistan are at odds.

Hispar

- The Hunza River is a tributary of the third-largest glacier in the Karakoram area.
- Combines with Biafo Glacier to cover approximately 65 square kilometers of Braldoh Valley.
- Kunyong/Lak (24 km) is a significant Hispar tributary.

Biafo

- The Braldoh Valley's fourth largest glacier is located between the Hispar and Baltoro glaciers.
- Occupies the Gori Ganga River valley, which was formed by the convergence of nine glaciers.

Pindari

- Pindari is a 90-kilometer round-trip walk located to the south of the Nanda Devi in northeast Uttarakhand. It is the source of the
- Pindar River is located in the upper ranges of the Kumaon Mountains.

Zemu

- At the head of the Zemu River, Zemu flows eastward.
- The Eastern Himalayas' largest glacier is approximately one kilometer broad and 180 meters thick (26 km)
- Located near the foot of Kanchanjunga
- One of the Teesta River's putative sources

Baltoro

Baltoro is a 65-kilometer-long glacier in the Karakoram range, west of the Siachen glacier, that gives rise to the Shigar River, a tributary of the Indus.

Bara Shigri Glacier

- This glacier, which feeds the Chandra River in Himachal Pradesh's Lahaul and Spiti valleys, is the third largest in India.
- It currently stretches across 27.7 kilometers and spans an area of 126.45 square kilometers. The glacier's highest point is 6363 meters.

- Bara Shigri feeds the Chandra River, which becomes Chandrabhaga or Chenab after meeting the Bhaga River at Tandi.

Drang-Drung Glacier

- This mountain glacier, also known as Drung Glacier, is India's fifth tallest. It is located in the Kargil area of Ladakh.
- The glacier's longest length is 23 kilometers, with an average elevation of 4,780 meters.
- The Drang-Drung Glacier is a long ice river that feeds the Stod River, which is a tributary of the Zanskar River, which is a tributary of the Indus River.
- The glacier is located in the Zanskar Range of the Himalayas, south of Kargil and east of Srinagar, the state capital of Jammu and Kashmir.

The Milam Glacier

- It is the longest glacier in the Uttarakhand tehsil of Munsiyari, Pithoragarh district, around 15 kilometers northeast of Nanda Devi.
- It is India's sixth-largest glacier, with an elevation ranging from roughly 5,500 meters to about 3,870 meters at its tip.
- This glacier is a popular hiking site.
- It is the source of the Goriganga River and encompasses around 37 km2.

The Shafat Glacier

- Parkachik Glacier is another name for this glacier. The Shafat Glacier is a 14-kilometer-long glacier in Ladakh, India, located in the Himalayan Range.
- The Shafat Glacier and Parkachik Glacier give rise to the more than 6800-meter-high Nun and Kun mountain peaks.
- It is 85 kilometers from Kargil and 294 kilometers from Srinagar.
- The melting water flows into the Suru River, a tributary of the Indus.

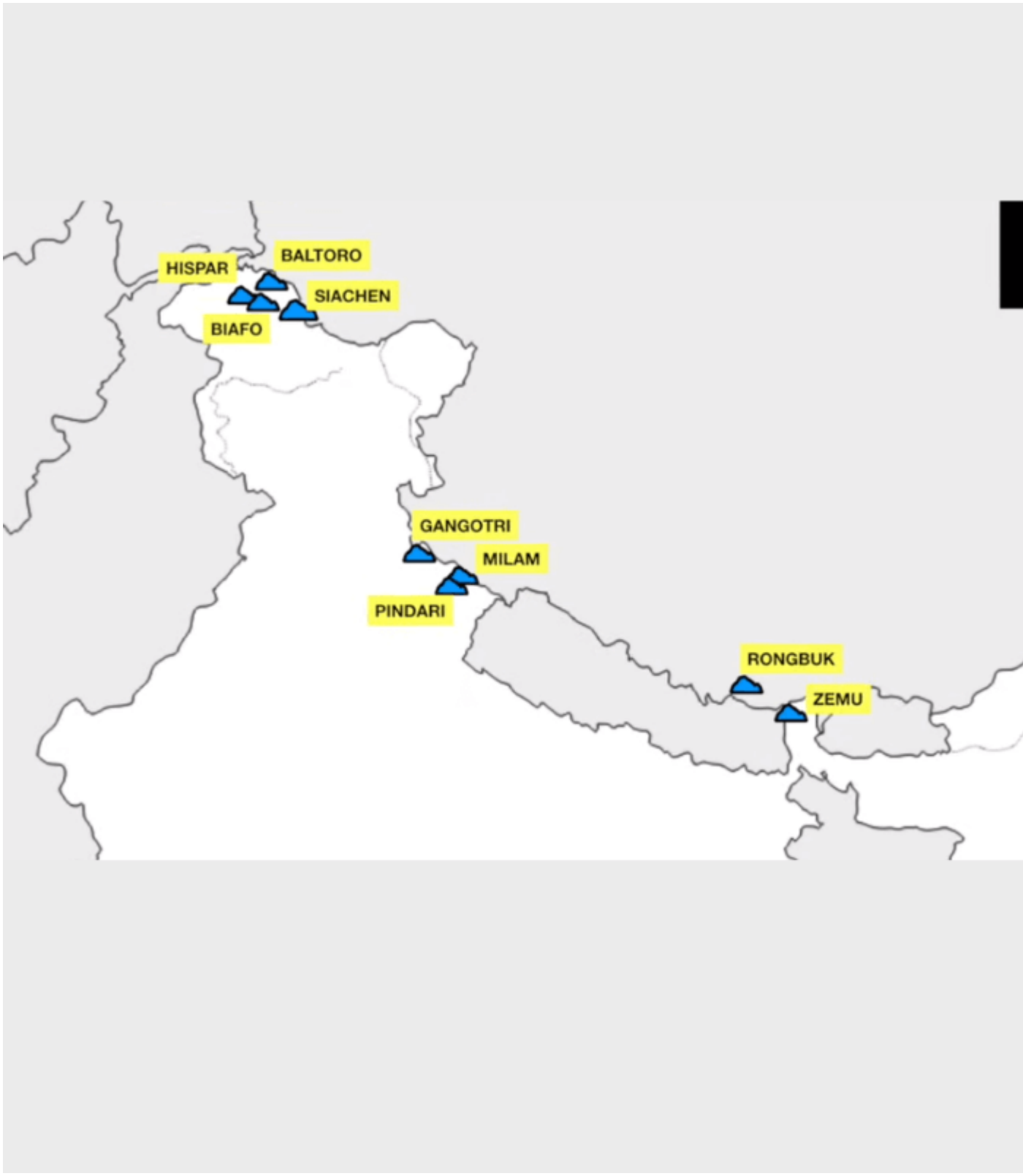
Chhota Shigri Glacier

- This glacier is located east of the Rohtang Pass on the northern slope of the main ridge of the Pir Panjal Range of the Himalayas (H.P.).
- It is the source of the Chandra River.
- The high, steep ridges and mountain topography allow for the development of this glacier.
- The glacier has an area of about 16 square kilometers.

- Chhota Shigri is one of the best-recorded mass budget studies in the entire Himalayan region, for example, at Jawaharlal Nehru University.

Machoi Glacier

- It is the source of the Sind and Dras rivers. It is situated in the Himalayan Range’s northeastern region.
- The Machoi Glacier is a 9-kilometer-long Himalayan glacier in Jammu, Kashmir, and Ladakh, India.
- It has an average elevation of 4800 meters.



Conclusion

The glacier, like others, has been melting at alarming rates as a result of global warming. The glaciers serve as proxies for global warming and climate change.

The Himalayan glaciers in India also serve as key freshwater supplies for the country's northern reservoirs and rivers. That is why glacier monitoring is critical.

UPSC Previous year question(2020)

Siachen Glacier is situated to the

(a) East of Aksai Chin

(b) East of Leh

(c) North of Gilgit

(d) North of Nubra Valley

Answer :(d) North of Nubra Valley

River Systems in India

River Systems in India can be broadly divided into 3 types :

- **Himalayan River Systems** – Indus, Brahmaputra, and Ganga River System
- **Peninsular River Systems** – Godavari, Krishna, Cauveri, and Mahanadi River System
- **West Flowing Peninsular River Systems** – Narmada, Tapti, Sabarmati River, Mahi, and Luni River

Indian River System and their Tributaries

Here is a brief detail of the Indian Rivers and their tributaries, i.e.,

- Indus River System
- Brahmaputra River System
- Ganga River System

- Narmada River System
- Yamuna River System
- Tapti River System
- Godavari River System
- Krishna River System
- Cauveri River System
- Mahanadi River System

1. Indus River System

Indus River, popularly known as the Puranik River, is one of the historical rivers found in mythological texts and great Hindu Sculptures. The key **features of the Indus River System in India** are as follows:

- It arises in Tibet from the northern slopes of the Kailash range of the Himalayas near Manasarovar Lake.
- Indus is one of the largest rivers, with significant tributaries from India and some parts of Pakistan.
- The River falls in the **Arabian Sea** near Karachi.
- The length of the river from its source to where it falls in the Arabian Sea is 2897 km.
- In India, it enters the JandK region and forms a picturesque gorge.

The major tributaries of the Indus River System are Sutlej, Beas, Chenab, Ravi, and Jhelum.

2. Brahmaputra River System

Like the Indus River System, the Brahmaputra River System originates from Manasarovar Lake. The key details of the ***Brahmaputra River System*** are as follows:

- Though the Brahmaputra is one of the major River systems in India, yet, most of its course lies outside of India.
- The total length of the Brahmaputra River System is 3848 km.

- It flows eastward, parallel to the Himalayas, and enters India in Arunachal Pradesh.
- Brahmaputra river is called as Dihang River in Arunachal Pradesh.

In Tibet, this Indian River System is known as the Tsangpo river. The Brahmaputra River System in India is considered the largest river in volume.

3. Ganga River System

The river Ganga derives its name from the Gangotri Glacier, its source.
The ***Ganga River System*** is explained below:

- Bishenganga, Dhauliganga, Pindar, and Mandakini rivers merge into Ganga before it reaches Devprayag.
- At Karan Prayag, the Nanda Devi unites with the Alaknanda River while the Pindar River rises from the Eastern Trishul.
- At Rudraprayag, it is joined by the Mandakini.
- The river Alaknanda and Bhagirathi is known as Ganga at Devprayag.

The Ganga River System in India has the following tributaries – Son, Ghaghara, Gomati, Ram Ganga, Sapti Kosi, Damodar, and Yamuna.

4. Narmada River System

Located in central India, the **Narmada River** drains out into the Arabian sea from the Bharuch region of Gujarat. Its features are:

- It originates in Madhya Pradesh, from the Amarkantak Hills, and runs to Gujarat and Maharashtra.
- Narmada lines the traditional frontier between southern and Northern India.
- Narmada flows from east to west along with the Mahi and Tapti rivers.
- Like the Yamuna, the Narmada River drains out from the Bharuch district of Gujarat into the Arabian Sea.

5. Yamuna River System

The Yamuna River is the largest tributary of the Ganga River System. The key features of the **Yamuna River System** are as follows:

- Yamuna River originates in Uttarakhand from the Yamunotri glacier.
- The largest tributary of the Yamuna River System is Tons.
- The Yamuna catchment extends to Madhya Pradesh, Rajasthan, Haryana, Uttar Pradesh, Himachal Pradesh, and Delhi.

The prominent tributaries of the Yamuna River System in India are Chambal, Betwa Ken, Hindon, and Sin.

6. Tapti River System

The **Tapti River System** is one of the most important river systems in peninsular India that originates from Southern Madhya Pradesh in the east-to-west direction.

- It drains through South Gujarat, Khandesh of Maharashtra, East Vidarbha region, and Nimar region of Madhya Pradesh.
- Tapi's river basin mostly lies in the northern and eastern districts of Maharastra and a few districts of Gujarat and Madhya Pradesh.

The prominent tributaries of the Tapi River System are the Bori River, Panzara River, Purna River, Girna River, Aner River, and Waghur River.

7. Godavari River System

The ***second largest Indian river system*** in terms of course with brownish water in India is the **Godavari River System**. The features are:

- It is called the Vriddh (old) Ganga or Dakshin (south) Ganga.
- The Godavari is one of the seasonal rivers in India that widens up during monsoons and gets dried during summers.
- The Godavari originates near Nasik from Trimbakeshwar in Maharashtra, flows through Orissa, Andhra Pradesh, Telangana, and Madhya Pradesh, and ends up in the Bay of Bengal.
- At Rajahmundry, it forms a delta.

- Its bank is considered holy and has been a pilgrimage site in Trimbak, Bhadrachalam, and Nasik.

Some of the major tributaries of the Godavari River System of India include Manjira, Sabari, Bindusara, Indravati River, and Pranahita. Also, Asia's largest bridge (road-cum-rail) is located on the Godavari river. It links Rajahmundry and Kovvur.

8. Krishna River System

Krishna river originates from Mahabaleshwar, Maharashtra. It is one of the major rivers in India; in terms of length, that flows through Sangli and ends up at the Bay of Bengal.

- It flows through Andhra Pradesh, Telangana, Karnataka, and Maharashtra.
- One of its major tributaries, Tungabhadra, is formed by Bhadra and Tunga Rivers and originates from the Western Ghats.

The **major tributaries of the Krishna River System** are Musi, Yerla, Warna, Ghataprabha, Dindi, Mallaprabha, Bhima, Koyna, and Dudhganga.

9. Cauveri River System

The Cauveri River System originates from the Western Ghats and is one of the pilgrimage sites for Hindus in the Kodagu district, Karnataka.

- It flows through Karnataka and Tamil Nadu and drains at the Bay of Bengal.
- People have been dependent on Cauvery for irrigation and agriculture since ancient times.

The major tributaries of the **Cauveri River Systems in India** are Tirtha, Noyyal, Bhavani, Lokapavani, Kabini, Lakshmana, Amaravati, Hannuhole, Shimsha, Kapila, Hemavati, Shisha, and Arkavathy.

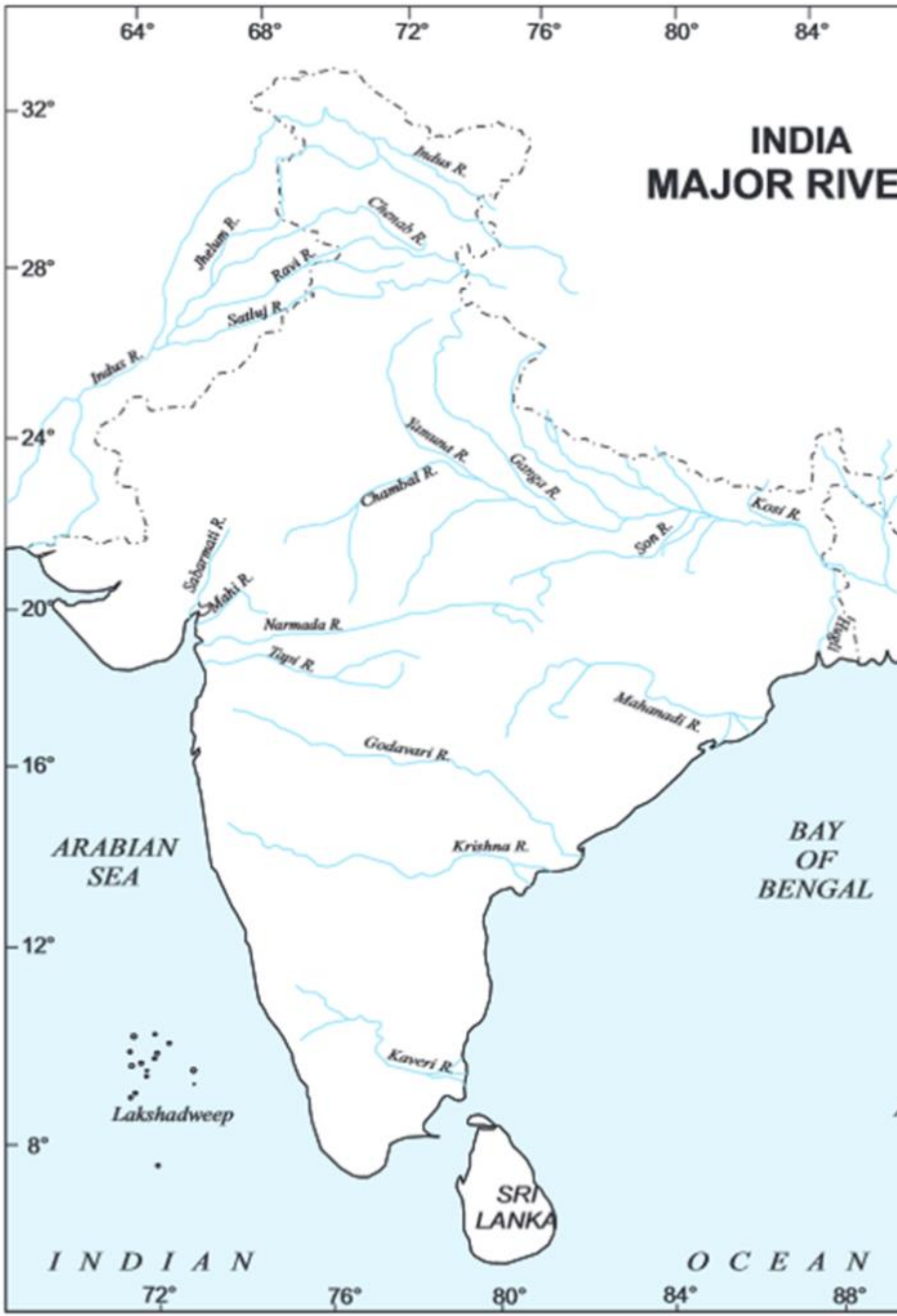
10. Mahanadi River System

The **Mahanadi River System** originates in central India from Satpura Range and flows in eastern India.

- It flows through Orissa, Jharkhand, Chhattisgarh, and Maharashtra.
- Hirakud Dam, the largest dam in India, is built on Mahanadi River System.

Concept of Perennial and Non-Perennial River Systems

- Perennial rivers are streams or rivers that **constantly run across their riverbed for a whole year**. The entire year, there is water in the riverbed of Perennial rivers.
- Non-perennial rivers are rivers or streams that **do not flow continuously throughout the entire year**. In contrast, the non-perennial rivers do not flow for at least a portion of the year.


INDIA
MAJOR RIVE
64°
68°
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76°
80°
84°
32°
28°
24°
20°
16°
12°
8°
Indus R.
Chenab R.
Jhelum R.
Ravi R.
Satluj R.
Indus R.
Yamuna R.
Ganga R.
Chambal R.
Kosi R.
Son R.
Sabarmati R.
Mahi R.
Narmada R.
Tapi R.
Mahanadi R.
Godavari R.
Krishna R.
Kaveri R.
ARABIAN
SEA
BAY
OF
BENGAL
Lakshadweep
SRI
LANKA
INDIAN
OCEAN
72°
76°
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