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Electrical Engineer

Non Technical

Volume - 2

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General Knowledge & Everyday Science



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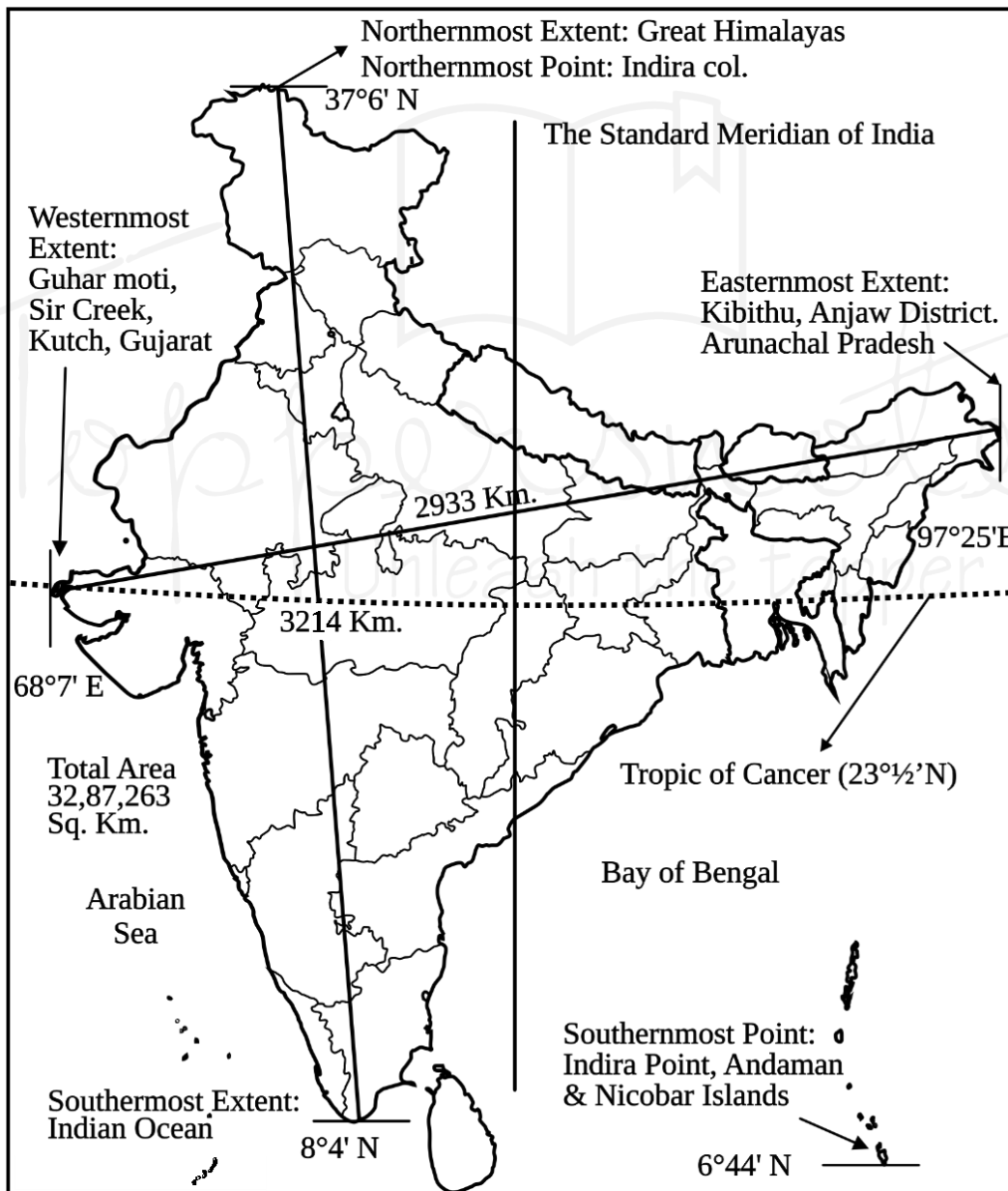
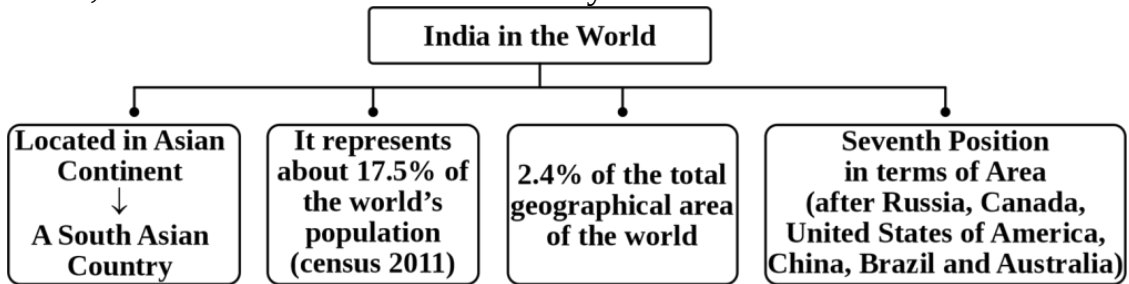
# 1

## CHAPTER

# Geographical Setting of India



- The Indian subcontinent, located in South Asia, is surrounded by water on three sides. To its south lies the Indian Ocean, to the west the Arabian Sea, and to the east the Bay of Bengal. In the north, India is connected to the Himalayas.



## India as a Geographical Unit

### 1. Geographical Extent

- ✓ **Latitudinal Spread:** 8° 4' N (southern tip) to 37° 6' N (northern tip).
- ✓ **Longitudinal Spread:** 68° 7' E (western edge) to 97° 25' E (eastern tip).
- ✓ **North-South distance:** 3214 km
- ✓ **East-west distance:** 2933 km
- ✓ **Total area of India** - 32,87,263 sq.km

### 2. Border Details

- ✓ **Total Land Border Length:** 15,106.7 km shared with neighboring countries.

### ✓ **Total Coastline Length:**

- Approx. 7,516.6 km along the mainland, islands, and bays.
- Revised coastline (including tidal inlets): 11,098 km.
- Territorial Waters: Extend 12 nautical miles (22.2 km) from the coast.
- ✓ Comprises 28 states and 8 Union territories
- ✓ **Total International Neighbors:** 7 (land); 9 (including maritime)

### **DID YOU KNOW?**

- The Indian Ocean hosts big-power military bases due to its vital trade routes, chokepoints, and strategic geopolitical benefits
- The southernmost part of India is the Indira Point is located on the island of Andaman and Nicobar.
- The southernmost point of the Indian mainland is Kanyakumari (also known as Cape Comorin), located in the state of Tamil Nadu. This is where the Indian Ocean, the Bay of Bengal, and the Arabian Sea meet.
- The westernmost point of India is the small village of Guhar Moti in the Kutch district of Gujarat
- The easternmost point of India is Kibithu, located in Arunachal Pradesh
- The northernmost point of India- Indira COL



## **Neighboring Countries of India & Bordering States**

Country	Border States	Length	Other Important Fact
Bangladesh	West Bengal, Assam, Meghalaya, Tripura, Mizoram	4,096.1	Fifth longest land boundary in the world.
China	J&K, Himachal Pradesh, Uttarakhand, Sikkim, Arunachal Pradesh	3488	
Pakistan	Jammu & Kashmir, Punjab, Rajasthan, Gujarat, Ladakh	3,323	Among India's neighboring countries, Pakistan has the highest number of "million-plus" cities, including Karachi, Lahore, Faisalabad, and Rawalpindi — each with a population exceeding one million.
Nepal	Bihar, Uttarakhand, Uttar Pradesh, Sikkim, West Bengal	1751	India shares an open border with Nepal.
Myanmar	Arunachal Pradesh, Nagaland, Manipur, Mizoram	1,643	Rohingya displacement issue.
Bhutan	Sikkim, Arunachal Pradesh, Assam, West Bengal	699	
Afghanistan	Ladakh (POK)	106	<b>Shortest Border:</b> With Afghanistan (via PoK) Called Wakkan Corridor.

### 3. Maritime Neighbors

#### ✓ Maldives

- **Official Language:** Dhivehi
  - ☞ Belongs to the Indo-Aryan language family.
  - ☞ Originated from the ancient Sinhalese language.
  - ☞ Written in the Thaana script, which is read from right to left.

#### ✓ Sri Lanka

- Sri Lanka is separated from India by the Palk Strait and the Gulf of Mannar. It lies between the coast of Tamil Nadu (India) and the Jaffna district (Sri Lanka).
- The strait is named after Robert Palk, former Governor of Madras.
- The Palk Strait is bounded by Pamban Island (India), Adam's Bridge (Ram Setu), and the Gulf of Mannar (Sri Lanka).

### 4. Key Parallels and Meridians

#### ✓ Tropic of Cancer:

- Divides India into 2 climatic zones
  - ☞ **Tropical Zone:** South of the tropic
  - ☞ **Subtropical Zone:** North of the Tropic

- Passes through 8 states → Gujarat, Rajasthan, MP, Chhattisgarh, Jharkhand, West Bengal, Tripura & Mizoram

#### ✓ Standard Meridian:

- Defines Indian Standard Time.
- It crosses UP, Chhattisgarh, Odisha, MP & Andhra Pradesh.
- Despite India's wide east-west spread, the entire country follows a single time zone for administrative convenience and uniformity.

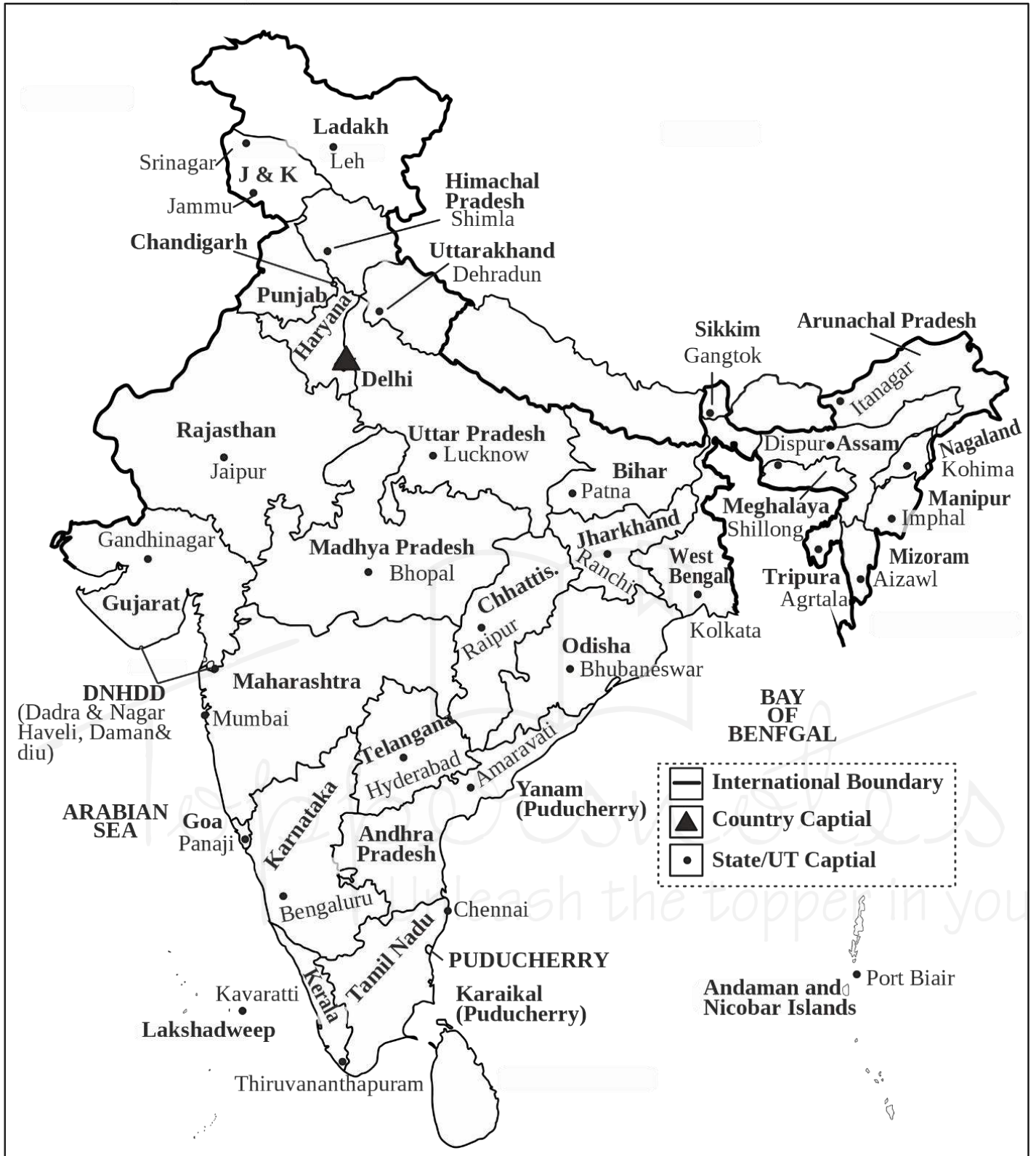
### The Greenwich Meridian, or 0° longitude:

- India follows its own Standard Meridian located at 82.5° East longitude, which passes near Mirzapur in Uttar Pradesh.
- This meridian is used to determine Indian Standard Time (IST), which is 5 hours and 30 minutes ahead of Greenwich Mean Time (GMT+5:30).
- India's longitudinal extent is approximately 30°, stretching from Gujarat in the west to Arunachal Pradesh in the east. Due to this, there is a **time difference of about two hours (104 minutes or 1 hour 44 minutes)** between the eastern and western extremes.

### Important International Boundary lines

Boundary Line	Between Countries
Radcliffe Line	India and Pakistan
MacMohan Line	India and China
Durand Line	Pakistan and Afghanistan
49th Parallel	USA and Canada (longest border)
38th Parallel	North Korea and South Korea
Hindenburg Line	Germany and Poland
Maginot Line	France and Germany
Oder-Neisse Line	Germany and Poland

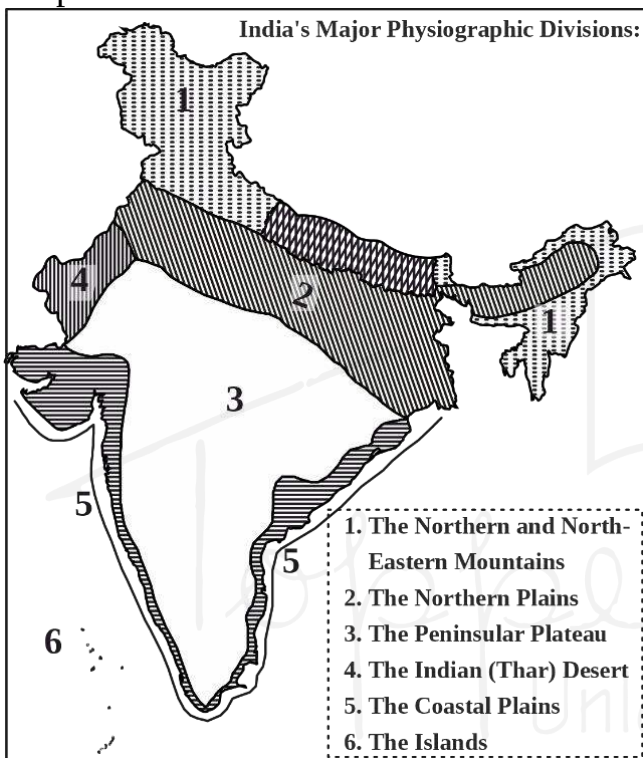
## States & capitals



# Structures and Physiography of India



- India's physical landscape is shaped by diverse geological structures and physiographic divisions formed over millions of years. This varied terrain influences climate, agriculture, biodiversity & human settlement patterns.



## The Northern and North-Eastern Mountains

- Comprise the **Himalayas** and **North-Eastern Hills**.
- **Himalayas:**



- ✓ Comprising parallel ranges: Trans-Himalaya, Greater Himalaya (Himadri), Middle Himalaya (Himachal), Shivalik. Which extend in an arc shape for about **2,400 km** from west to east.
- ✓ **Orientation:** NW–SE (main ranges), E–W (Sikkim), N–S (Nagaland, Mizoram).
- ✓ Act as climatic, physical, drainage, and cultural barriers.
- ✓ The Himalayas are a type of **young fold mountains**.
- ✓ According to the **Plate Tectonic Theory**, the Himalayas were formed by the **compression of sediments** of the **Tethys Sea**.
- ✓ In India, the **Himalayas and the Northern Plains** are **newly formed landforms**.

### **Hindukush**

- The Hindukush Mountain range is **not included among the major mountain ranges of India**.
- It is an approximately **800-kilometre-long mountain range** that passes through **Afghanistan, northern Pakistan, and Tajikistan**.
- **Tirich Mir**, located in the **Chitral district of Pakistan**, is the **highest peak** of this range.

## Subdivision-

### **A. North–South Division of the Himalayas (longitudinal range)**

Division	Characteristics	Peaks
Great Himalayas	i. Highest, most continuous belt (mean elevation ~6,100 m) steep south face; asymmetrical fold	<b>Major Peaks:</b> Everest (8,848 m),

(Himadri, Inner Himalayas)	<p>structural convex profile ending abruptly at Nanga Parbat (8,126 m) in the west and Namcha Barwa (7,782 m) in the east.</p> <p>ii. The <b>Greater Himalayas</b> and the <b>Lesser Himalayas</b> are separated by the <b>Main Central Thrust (MCT)</b>.</p>	<p>Kanchenjunga (8,598 m), Lhotse, Cho Oyu, Makalu, Dhaulagiri (Nepal), Nanda Devi (7817 m, Uttarakhand), Trishul, etc.</p> <p><b>Note:</b> However, according to the latest measurements, China and Nepal have certified the height of Mount Everest as 8,848.86 meters.</p>
Lesser Himalayas (Middle Himalayas)	<p>i. Elevations between 3,500 m &amp; 4,500 m</p> <p>ii. Rugged uplands interspersed with large valleys (Kashmir, Kullu, Kangra).</p>	<p>Nag Tibba, Mahabharat Lekh, Dhauladhar Range (Himachal Pradesh)</p>
Shivaliks (Outer Himalayas)	<p>i. Low relief (900–1,100 m)</p> <p>ii. <b>Medium Width (10 to 50 km)</b></p> <p>iii. Wide alluvial valleys, known as “<b>Doons</b>” (e.g., <b>Dehradun</b> – the largest Doon, <b>Kotli Doon</b>, <b>Patlidun</b>), are <b>longitudinal valleys</b> located between the <b>Lesser Himalayas</b> and the <b>Shivalik Hills</b>.</p> <p>iv. <b>Seasonal streams (Chos)</b> flow through these regions.</p>	

### Mount Everest

- Its height is **8,848(29032 feet) meters**
- This peak is located on the **border between Nepal and the Tibet Autonomous Region of China**.
- **Mount Everest** is the **highest peak of the Himalayan Mountain range** and is considered the **tallest point on Earth**.

### Kangchenjunga

- **Kangchenjunga**, located in **India (Sikkim)**, is the **third-highest mountain in the world**, with a height of **8,598 meters (28,169 feet)**.
- It was **officially declared the third-highest mountain in the world in 1856**.
- It is situated in the **eastern Himalayas**, on the **border between India and eastern Nepal**. **Kangchenjunga** consists of **five peaks** and is known in **Sikkim** as the “**Five Treasures of Snow**.”

### Saltoro Kangri

- It is the **highest peak of the Saltoro range**, a subrange of the **Karakoram Mountain range**.

- It is located near the **Actual Ground Position Line (AGPL)** and forms part of the boundary between the **Indian and Pakistan-controlled areas** in the **Siachen Glacier region**.
- **Saltoro Kangri** lies in a **disputed area between India and Pakistan**, specifically in the **Siachen Glacier region of the Karakoram range**.
- The region holds **extreme strategic importance**, which is why both countries maintain a **military presence**, making it **one of the highest battlefields in the world**.

## B. East–West Division of the Himalayas

Division	Characteristics	Peaks / Ranges
<b>Kashmir / Northwestern Himalayas</b>	<ul style="list-style-type: none"> <li>i. Kashmir Valley (Tectonic) with Dal and Wular lakes</li> <li>ii. Pangong Tso in Ladakh</li> <li>iii. Karewas (lacustrine benches) famous for saffron cultivation</li> <li>iv. The <b>Pir Panjal range</b> passes through the states of <b>Jammu &amp; Kashmir</b> and <b>Himachal Pradesh</b>, and it is the <b>longest mountain range</b>.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Key Ranges:</b> Karakoram, Ladakh, Zaskar (Saser Kangri), Pir Panjal (from north to south in order)</li> <li>➤ <b>Major Peaks:</b> K2 (8611 m, India's highest peak, POK), Nanga Parbat, Gasherbrum, Rakaposhi</li> </ul>
<b>Himachal &amp; Uttarakhand Himalayas</b>	<ul style="list-style-type: none"> <li>➤ The entire region comprising the <b>Himadri, Himachal, and Shivalik ranges</b> is broadly known as the <b>Kumaun Himalayas</b>.</li> <li>➤ In <b>Himachal Pradesh</b>, the <b>Kangra</b> and <b>Kullu</b> valleys are located.</li> <li>➤ This region lies <b>between the Sutlej and Kali rivers</b>.</li> <li>➤ Valley of Flowers</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Key Ranges:</b> Great Himalayas, Dhauladhar, Nag Tibba subranges &amp; Shiwaliks.</li> <li>➤ <b>Major Peaks:</b> Kamet (7756m), Nanda Devi, Kedarnath, Trishul, Bandarpunch (A <b>major tributary of the main course of the Yamuna River</b>.)</li> </ul>
<b>Nepal Himalayas</b>	<ul style="list-style-type: none"> <li>i. Highest continuous Himalayan section</li> <li>ii. Renowned tea gardens along the southern foothills.</li> <li>iii. Located <b>between the Kali and Teesta rivers</b>.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Key Ranges:</b> Mahabharat and Churia ranges.</li> <li>➤ <b>Major Peaks:</b> Everest, Annapurna, Dhaulagiri, Makalu.</li> </ul>
<b>Darjeeling &amp; Sikkim Himalayas</b>	<ul style="list-style-type: none"> <li>i. Famous tea plantations</li> <li>ii. Exceptional orchid diversity</li> <li>iii. Home to the Lepcha tribe.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Key Ranges:</b> Kanchenjunga, adjacent folds of the Mahabharat range.</li> <li>➤ <b>Major Peak:</b> Kanchenjunga (8,586 m).</li> </ul>

<b>Arunachal Himalayas or Asam Himalayas</b>	<ul style="list-style-type: none"> <li>➤ It is located <b>between the Teesta River in the west and the Dihang River in the east</b> (called <b>Siang River</b> or <b>Tsangpo</b> in Tibet).</li> <li>➤ The <b>Brahmaputra River</b> marks the <b>easternmost boundary of the Himalayas</b>.</li> </ul>	<ul style="list-style-type: none"> <li>➤ <b>Key Ranges:</b> Patkai Bum, Naga Hills, Abor Hills.</li> <li>➤ <b>Major Peaks:</b> Namcha Barwa, Kangtu.</li> </ul>
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### C. Purvanchal Himalayas

- ✓ The eastern extension of the Himalayas in Northeast India, curving southward beyond the Dihang Gorge, forming a series of hill ranges running mostly north–south.

Sub-Range	Composition & Structure	Characteristics & uses	Highest Peak	Other Features
<b>Patkai Bum</b>	Highly dissected hills cloaked in dense rainforest	Forms international boundary between Arunachal Pradesh & Myanmar	—	Biodiversity hotspot
<b>Naga Hills</b>	Predominantly igneous and metamorphic rocks	Acts as watershed between India and Myanmar	Mount Saramati	Jhum cultivation by indigenous Naga tribes
<b>Manipur Hills</b>	Sedimentary layers with clay deposits	Southward continuation of the Naga range	—	—
<b>Barail Range</b>	Folded deposits separating it from Naga Hills	Characterized by narrow valleys and mid-elevations	Mount Tempu/Iso (Manipur)	—
<b>Mizo (Lushai) Hills</b>	Unconsolidated sediments of the molasse basin	Known locally as “Blue Mountain” region	Phawngpui (2,157 m)	Rich tribal cultures and continuous jhum farming

### ✓ Meghalaya

- **Garo, Khasi, and Jaintia Hills**, formed during the **Malwa Plateau period**.
- These hills are named after the **tribes that predominantly inhabit them**.
- **Mawsynram**, located in the **Khasi Hills of Meghalaya**, is famous for receiving the **highest annual rainfall on Earth**. The **distinct topographical structure of the Khasi Hills** promotes the **orographic uplift of monsoon clouds**, resulting in **extremely heavy rainfall**.
- The **capital of Meghalaya, Shillong**, is situated in the **Khasi Hills**.
- Due to its **natural beauty and greenery**, Meghalaya is also referred to as the **“Scotland of the East.”**

## Prominent Himalayan Glaciers

Glacier Name	Location	Important Features
<b>Siachen</b>	Karakoram ranges	Nubra Valley of Himalayas; 2nd longest glacier outside Polar region largest glacier of trans-Himalayas
<b>Biafo</b>	Karakoram	Flows into the Shigar River
<b>Gangotri</b>	Uttarakhand	Origin below Chaukhamba Peak; also known as 'Gomukh'
<b>Hispar</b>	Gilgit-Baltistan	World's longest glacial system
<b>Zemu</b>	Sikkim/Nepal	Largest glacier of Eastern Himalaya; feeds River Teesta
<b>Sonapani</b>	Lahaul & Spiti, HP	Longest glacier in the Pir Panjal range. A glacier stream is a tributary to the Chandra River, which later merges with the Bhaga River to form the Chenab.
<b>Milam</b>	Uttarakhand	Major source of River Gori Ganga (Saryu); biggest glacier in Kumaon Himalaya
<b>Chong Kumdan</b>	Karakoram, Ladakh	Feeds Shyok River due to potential blocking
<b>Diamir</b>	POK	
<b>Rupal</b>	Kashmir	In Greater Himalayas; flows north eastward
<b>Bhillans, Thajivas, and Prui</b>	Jammu and Kashmir	

## Prominent Himalayan Passes

Pass Name	State / UT	Location / Border	Importance
<b>Zoji La</b>	Jammu & Kashmir, Ladakh	Greater Himalayas	Connects Srinagar–Leh; vital for defence
<b>Banihal Pass</b>	Jammu & Kashmir	Pir Panjal Range	<b>Jawahar Tunnel</b> passes beneath it; <b>Srinagar–Jammu route</b> ; a pass connecting the rest of India to Kashmir.
<b>Khardung La</b>	Ladakh	Ladakh Range	Road to Siachen; one of highest motorable roads
<b>Chang La</b>	Ladakh	Ladakh Range	Connects Leh to Pangong Lake
<b>Fotu La</b>	Ladakh	Zaskar Range	Highest point on Srinagar–Leh highway
<b>Namika La</b>	Ladakh	Zaskar Range	On Kargil–Leh route
<b>Baralacha La</b>	Himachal Pradesh	Zaskar Range	On Leh–Manali highway
<b>Shipki La</b>	Himachal Pradesh	India–Tibet Border (Kinnaur)	Historic silk route for trade.
<b>Mana Pass</b>	Uttarakhand	Chamoli District	Road to Kailash–Mansarovar; Indo-China route

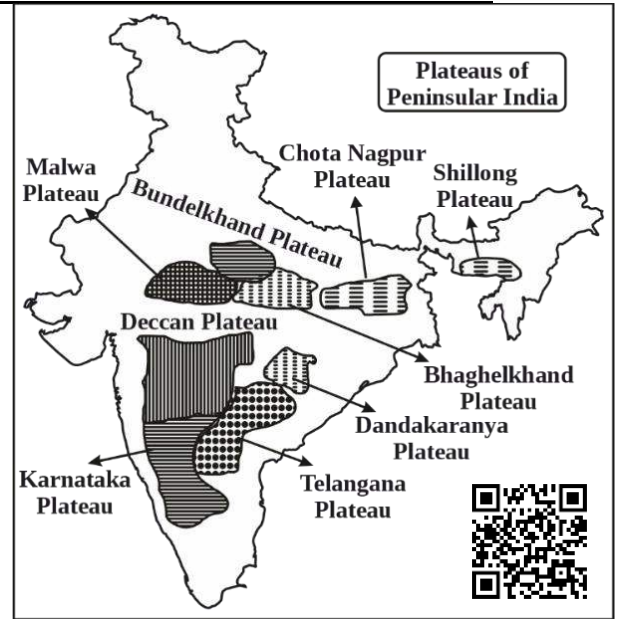
<b>Niti Pass</b>	Uttarakhand	Chamoli District	Old trade route to Tibet
<b>Lipulekh Pass</b>	Uttarakhand	Pithoragarh District	Kailash–Mansarovar Yatra route; India–Nepal–Tibet tri-junction
<b>Nathu La</b>	Sikkim	Indo–China Border	A border trade post with China; one of the highest motorable roads in the world and a mountain pass in the Himalayan peaks, connecting Sikkim with the Tibet Autonomous Region of China.
<b>Jelep La</b>	Sikkim	Near Kalimpong	Trade route to Lhasa in historical times
<b>Sella Pass</b>	Arunachal Pradesh	Tawang District	Connects Tawang to rest of state; Sella tunnel world's Longest twin lane tunnel above 13000 feet altitude.
<b>Bum La</b>	Arunachal Pradesh	Near Tawang	Indo–China sensitive military pass
<b>Dipher Pass</b>	Arunachal Pradesh	East Kameng	Eastern Himalayas, remote and strategic
<b>Khunjerab Pass</b>	(POK)	Gilgit–Baltistan (Pak-Occupied Kashmir)	On China–Pakistan border; on CPEC route
<b>Lanak La</b>	Ladakh (Disputed Border)	Aksai Chin region (Indo-China)	Disputed India–China border crossing
<b>Lekhapani</b>	Arunachal Pradesh	Eastern tip near Assam-Arunachal	Historic WW-II route via Stilwell Road; strategic for eastern sector
<b>Rohtang Pass</b>	Himachal Pradesh	Pir Panjal Range	Connects <b>Kullu Valley</b> to <b>Lahaul and Spiti valleys</b> ; separates <b>Chenab and Beas basins</b>
<b>Debsa Pass</b>	Himachal Pradesh	-	Located between <b>Kullu and Spiti districts</b>
<b>Dihang Pass</b>	Arunachal Pradesh	-	Connects <b>Arunachal Pradesh</b> to <b>Myanmar</b>
<b>Khyber Pass</b>	Pakistan–Afghanistan		Connects <b>Peshawar (Pakistan)</b> to <b>Jalalabad (Afghanistan)</b> ; part of the <b>ancient Silk Road trade network</b>
<b>Muling La Pass &amp; Mangsha Dhura Pass</b>	Uttarakhand	Greater Himalayas	Connects <b>Uttarakhand</b> to <b>Tibet</b>

## The Northern Plains



- Formed by alluvial deposition from Indus, Ganga & Brahmaputra.
- **Size:** About 3,200 km long and 150–300 km wide.
- Divided into: (from north-south)
  - ✓ **Bhabar** (rocky, porous belt near base of Shiwaliks)
  - ✓ **Tarai** (marshy, re-emergent rivers-Dudhwa National Park located)
  - ✓ **Alluvial Plains:**
    - **Khadar** – newer alluvium, floodplain deposits, fertile
    - **Bhangar** – older alluvium, calcareous in nature
- The **plain formed by river erosion** is known as the **Penplain**.
- **Ganga–Brahmaputra Plains**
  - ✓ A **highly flood-prone plain**.
  - ✓ The **Ganga Plain** is located between the **Ghaggar and Teesta rivers**.
  - ✓ This region contains the **Sundarbans**, the **world's largest delta**, and the vast **Ganga plains**, which are **densely populated**.
  - ✓ The **northernmost point** of the **Ganga Delta** is **Farakka**.
  - ✓ The **Sundarbans Forest** is famous for its **mangrove vegetation**.
  - ✓ In the plains, **ox-bow lakes (Gokhur lakes)** are a common feature.
  - ✓ **Alluvial terraces (Bhangar)** are a prominent feature of the **upper and middle Ganga plains**.
  - ✓ **River islands**, such as **Majuli (Assam)**, are among the **largest river islands in the world**.

## The Peninsular Plateau



- **India's largest and oldest landmass**, which originated from **Gondwana Land**, and is an **extremely stable and rigid terrain**.
- **Elevation:** Ranges between 150–900 m.
- **Slope:** Tilts eastward, with black soil in the northwest.
- **Dominance of black soil in the north-western region.**
- The **Narmada River** divides the **peninsular plateau** into two distinct regions: the **Malwa Plateau** in the north and the **Deccan Plateau** in the south.
- **Divisions:**
  - ✓ **Deccan Plateau**
  - ✓ In **South India**, the **Deccan Plateau**, composed of **basalt rocks**, is a **triangular landform** situated between the **Western Ghats** and **Eastern Ghats**.
  - ✓ The **Deccan Traps** were formed at the **end of the Cretaceous period**.
  - ✓ This **peninsular region** extends **south of the Narmada River** and is **bounded to the north by the Satpura and Vindhya ranges**.
  - ✓ Rivers flowing from the Deccan Plateau have created **numerous deep valleys**, dividing it into several smaller plateaus, including the **Maharashtra Plateau**, **Karnataka Plateau**, and **Andhra Pradesh/Telangana Plateau**.

- ✓ The **black soil region** of the peninsular plateau is called the **Deccan Trap**, which is a **vast igneous province of west-central India**.
- ✓ This region is famous for its **fertile black soil (Regur soil)**, which is **ideal for cotton cultivation**.
- ✓ The black soil is **rich in calcium carbonate, magnesium, potash, and lime**, but is **deficient in nitrogen and organic matter**.
- ✓ Its **moisture-retaining capacity** makes it **suitable for dry farming** as well.

#### **Karnataka Plateau**

- The **Karnataka Plateau**, also called the **Mysore Plateau**, is located **south of the Maharashtra Plateau**.
- The Karnataka Plateau is divided into **two parts – ‘Malnad’ and ‘Maidan’**. “Malnad” means “**hilly country**” in the Kannada language and is characterized by **dense forests and deep valleys**.
- In contrast, the **Maidan region** consists of **rolling plains and low granite hills**.

#### ➤ **Western Ghats:**

- ✓ Known locally as the **Sahyadri** (Maharashtra), the **Nilgiri Hills** (Karnataka and Tamil Nadu), and the **Anaimalai and Cardamom Hills** (Kerala’s Malabar Coast).
- ✓ Average height ~1,500 m; becomes higher and more continuous toward the south.
- ✓ Spread across **Kerala, Tamil Nadu, Karnataka, Goa, Maharashtra, Gujarat (Dhinodhar Hills)**.
- ✓ Source of major rivers: **Godavari, Krishna, Kaveri**.
- ✓ **Highest peaks:** Anamudi (2,695 m), **Doddabetta** (2,633 m), **Ooty** (2,240 m), **Pushpagir** (1,712 m) in the Nilgiris.
- ✓ Famous hill stations: **Ooty (the second-highest hill station above sea level)**, **Munnar**, **Kodaikanal (located in the Palani Hills)**.

- ✓ “**Kudremukh**,” the **third-highest peak of Karnataka**, is located in the **Chikkamagaluru district**. This **distinctive peak is shaped like a horse’s face**.
- ✓ **Nilgiris (Blue Mountains)**
  - The **Nilgiri mountain range** is located at the **tri-junction of Tamil Nadu, Kerala, and Karnataka** in South India.
  - It is part of the **Western Ghats**, which run **parallel to the western coast of the Indian Peninsula**.
  - The **highest peak** of this range is **Doddabetta (Nilgiri Mountains)**, with an elevation of **2,633 meters (8,652 feet)**.
  - The Nilgiris are also famous for **tea and coffee plantations**, producing **high-quality tea and coffee**.
- ✓ **Kalsubai**
  - **Kalsubai** is the **highest peak of Maharashtra**, located in **Akola Taluk, Ahmednagar district**. The river **Godavari** emerge from here.
  - This **northern peak of the Sahyadri mountain range** has an elevation of **1,646 meters (approximately 5,400 feet)**.
  - It is also called the “**Everest of Maharashtra**”. A **small temple of Goddess Kalsubai** is located at the summit, which is **religiously significant to the local people**.
- ✓ **Taramati Peak**
  - **Taramati Peak** is one of the two **major peaks of Harishchandragad**.
  - It is situated at an elevation of **1,431 meters (4,695 feet) above sea level** and is considered the **sixth-highest peak in Maharashtra**.
  - Located on the **Harishchandragad plateau**, it offers an **excellent trekking experience** for both **beginner and expert hikers** due to its **natural beauty and challenging trails**.

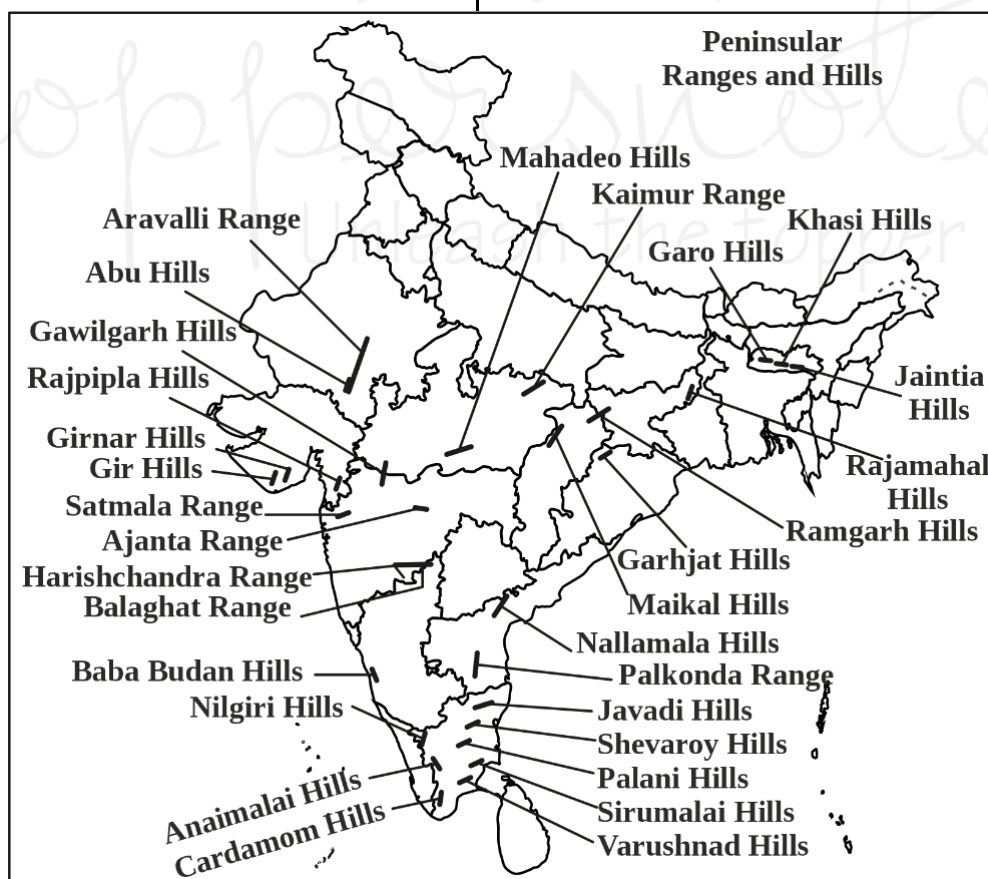
**Various passes in the Western Ghats, called Ghat sections – Thal Ghat, Bhore Ghat, and Pal Ghat (from north to south)**

- **Thal Ghat** – A mountain pass near **Kasara town in Maharashtra**, located on the **Mumbai–Nashik route**.
- **Bhore Ghat** – A mountain route situated on the **Western Ghats**, connecting **Palsadri and Khandala by railway** and **Khopoli and Khandala by road** in Maharashtra.
- **Pal Ghat (Palakkad Pass)** – This pass is **approximately 32 km wide across the Western Ghats**, located on the **Kerala–Tamil Nadu border**, serving as a **major communication route** between the two states.

- ✓ Average height: 600 m
- ✓ Principal ranges (north to south): **Mahendragiri** (highest peak – Odisha -1500m), **Nallamala Hills** (Srisailam temple), **Velikonda, Palkonda, Javadi, Shevaroy, Pachamalai, Sirumalai Hills**.
- ✓ At the Nilgiris, Eastern and Western Ghats meet, forming a corridor with Sathyamangalam Tiger Reserve (Tamil Nadu).
- ✓ **Devmalai Peak**, with an elevation of **1,672 meters**, is the **highest peak of Odisha**. It is located in the **Chandragiri–Pottangi subrange of the Eastern Ghats**. Devmalai is found in the **Koraput district of southern Odisha**, near **Koraput town**.
- ✓ The **Eastern Ghats run parallel to the eastern coast**, between the **Mahanadi and Vaigai rivers**, extending **from the Mahanadi valley southwards to the Nilgiris**.

➤ **Eastern Ghats:**

- ✓ Broken, lower, heavily eroded hill chain running through **Odisha, Andhra Pradesh, Tamil Nadu, Karnataka, Telangana**.



## Central Highlands

- Bounded to the west by the Aravallis
- Formed by disjunctive ranges of Vindhya, Satpura ranges.
- **Mount Dhoopgarh**, also called **Dhoopgarh**, is located in the **Mahadev Hills of the Satpura Range in Madhya Pradesh** and is the **highest peak of the Satpura Range**. Its elevation is **1,352 meters (4,429 feet)**. It is situated in the **Pachmarhi region** and is considered a popular spot for viewing sunsets. The **Pachmarhi hill station** is located near this peak.

### 1. Vindhya Range

- ✓ This **mountain range** forms the **traditional boundary between North and South India** and separates the **Ganga plains from the Deccan Plateau**. The **Tropic of Cancer** also passes through this range.
- ✓ It is **bounded by the Satpura Range in the south** and the **Aravalis in the northwest**.
- ✓ Its **highest point** is **Goodwil Peak**, also known as **Kalumar or Kalumbe Peak**, with an elevation of approximately **2,467 feet above sea level**, located near **Singrampur in Damoh district of Madhya Pradesh**, in the **Bhanrer or Panna hill region**.
- ✓ The Vindhya Range extends mainly across the **states of Gujarat, Rajasthan, and Madhya Pradesh**.
- ✓ The **Kaimur Range** is the **eastern part of the Vindhya Range**, starting from the **Katangi region of Jabalpur district in Madhya Pradesh** and extending to **Sasaram in Rohtas district of Bihar**, with a total length of approximately **483 kilometers (300 miles)**.

### 2. Bailadila Range

- ✓ The **Bailadila Range** is located in **Dantewada (South Bastar) district of Chhattisgarh**.
- ✓ It is named "**Bailadila**" because its hills **resemble the hump of a bull**.
- ✓ This range is considered the **highest point of Chhattisgarh**. Bailadila is famous for its **high-grade hematite iron ore**, which is exported to **Japan, Slovakia, Italy, Sri Lanka, and other countries**.

### 3. Aravali Range

- ✓ The **Aravali Range** is the **oldest folded mountain range of India**, extending from **Delhi through southern Haryana and Rajasthan**, ending in **Gujarat**. In Rajasthan, its orientation is from **northeast to southwest**.
- ✓ It also functions as a **watershed** at 25 cm rainfall.
- ✓ **Guru Shikhar** is the **highest peak of the Aravali Range**, located in **Sirohi district of Rajasthan**, with an elevation of **1,722 meters (5,650 feet)**. It hosts the **Mount Abu Observatory**, operated by the **Physical Research Laboratory, Ahmedabad**.
- ✓ The peak is named after the **Hindu deity Guru Dattatreya**, with a temple at the summit. **Kumbhalgarh Fort**, called the "**Great Wall of India**", is located on the **western edge of the Aravalis**, and its wall is the **second-longest wall in the world after China's Great Wall**.
- ✓ The **Delhi Ridge** is also part of this range and serves as a **watershed between the Ganga and Indus rivers**.

#### 4. Maikal Range

- ✓ The **Maikal Range** is the eastern part of the **Satpura Range**, extending across **Kawardha district** in **Chhattisgarh** and **Anuppur district** in **Madhya Pradesh**.
- ✓ The **Narmada, Mahanadi, and Son rivers** originate from this range.
- ✓ Its **highest peak** is **Amarkantak**, which holds **great religious and geographical significance**.
- ✓ The **Kanha National Park** is also located in the Maikal Hills.
- ✓ The **Baiga and Gond tribes** primarily inhabit this region.

#### **Melghat Pass (Maharashtra to MP)**

- Located in the **Satpura Range of Maharashtra**, the **Melghat Pass** is notable for its **geographical location and ecological richness**.
- The **Melghat Tiger Reserve** is situated here, spreading across the **Amravati, Akola, and Buldhana districts of Maharashtra**.

#### 5. Bundelkhand

- ✓ The **eastern extension of the Malwa Plateau**, Bundelkhand is a **historical region of central India**, now part of **Madhya Pradesh**.
- ✓ It is characterized by the **Vindhya region, ravines, and the northeastern plains**.

#### 6. Baghelkhand

- ✓ Located in **southern Uttar Pradesh and northern Madhya Pradesh**, Baghelkhand lies **east of the Maikal Range and south of the Son River valley**.
- ✓ Its elevation ranges from **150–1,200 meters**. The **western part** is composed of **limestone and sandstone**, while the **eastern part** consists of **granite**.

#### 7. Dandakaranya

- ✓ The **Dandakaranya region** is a **plateau region spread across Chhattisgarh, Odisha, and Andhra Pradesh**.
- ✓ It extends **between the Abujhmad hills in the west and the Eastern Ghats in the east**.
- ✓ It is formed of **ancient Dharwar rocks** and extends to the **plains of Bastar, reaching Bijapur and Sukma districts**.
- ✓ Its **highest peak** is **Nandiraj in Bailadila**, with an elevation of **1,210 meters**.
- ✓ This region is part of the **Godavari drainage system**, with the **Indravati River** being the most prominent river.

#### 8. Malwa Plateau

- ✓ The **Malwa Plateau** is an **important plateau region of north-central India**.
- ✓ It is **bounded by Bundelkhand in the north, the Vindhya Range in the east and south, Gujarat plains in the west, and the Aravalis in the northwest**, forming a **watershed between the Ganga and Narmada basins**.
- ✓ Its elevation ranges from **1,650 to 2,000 feet**.
- ✓ The **western part** is drained by the **Mahi River**, the **central part** by the **Chambal River**, and the **eastern part** by the **Betwa, Dhasan, and Ken rivers**.

#### North-Eastern Plateau

- Extension of Peninsular plateau Includes **Chotanagpur, Shillong, Meghalaya (Garo, Khasi, Jaintia)**.

➤ **Features:** Rich in minerals, highly eroded (e.g., Mawsynram, Meghalaya, known for intense rainfall and rugged terrain).

➤ **Chota Nagpur Plateau**

✓ The **Chota Nagpur Plateau** is a **continental plateau located in eastern India.**

Besides **Jharkhand**, it also includes surrounding areas of **Bihar, Odisha, West Bengal, and Chhattisgarh.**

✓ Its **total area** is approximately **65,000 square kilometers.**

✓ To the **north and east** of this plateau lies the **Ganga plains**, while to the **south** is the **Mahanadi basin**. It is also the **most mineral-rich plateau.**

✓ The plateau features the **Hundru Waterfall** in Jharkhand.

➤ **Parasnath Hill**

✓ **Parasnath Hill**, located in the **eastern part of the Chota Nagpur Plateau**, is the **highest peak of Jharkhand**, with an elevation of approximately **1,365 meters.**

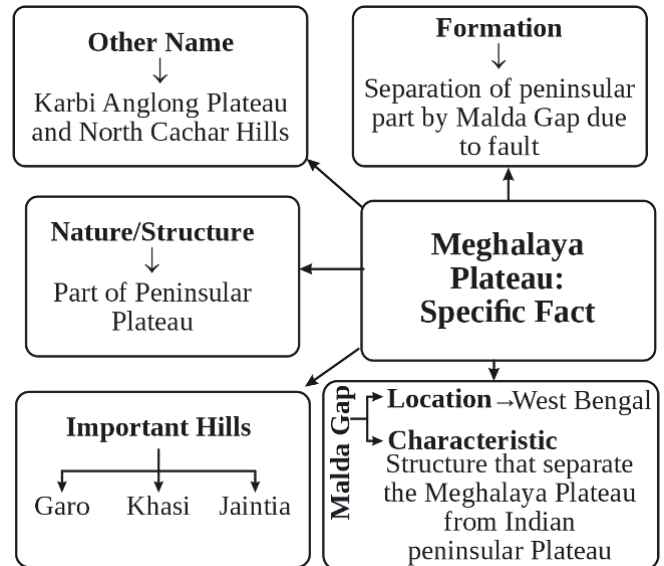
✓ It is situated in **Giridih district.**

✓ The hill is named after **Lord Parshvanath**, the **23rd Tirthankara of Jainism.**

✓ It is an **extremely important pilgrimage site for Jain devotees** and is also called **“Shikharji”.**

✓ It is believed that **several Tirthankaras, including the 9th Tirthankara, attained Kaiwalya (liberation) on this hill.**

✓ **Separate temples have been constructed for each Tirthankara on this hill.**



**The Indian Desert**



➤ **Location:** It lies **northwest of the Aravalli Range** and is known as the **Thar Desert**. It is located in the **western part of India**. About **85% of the Thar Desert** lies in **India**, and the remaining **15% is in Pakistan.**

➤ **Landscape:** Arid zone with sand dunes and barchans (crescent-shaped dunes), known locally as Marusthali.

➤ **Rainfall:** Very low, less than 150 mm annually; features inland drainage (no major rivers reaching the sea).

➤ **Rivers:** Luni River flows seasonally in the southern desert.

➤ **Other Features:**

✓ Presence of lakes and brackish playas, which are important sources of salt. Khadeen agriculture practiced.

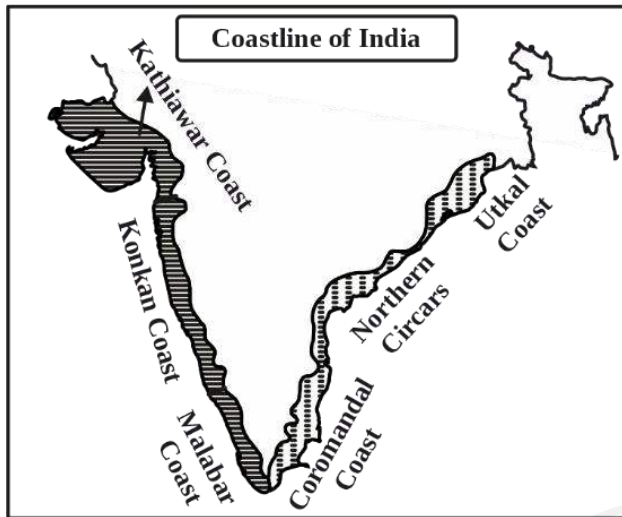
✓ The **Lathi Range and chandan water belt** is a **geological water belt spread across Jaisalmer.**

✓ The process of **desertification** begins and spreads due to **overgrazing, intensive agriculture, deforestation, and improper management of soil and water.**

✓ **Jaisalmer** is the **driest place in India.**

## The Coastal Plains

- Gujarat has the **largest share (23%) in India's longest coastline**, followed by **Andhra Pradesh** and **Tamil Nadu**.
- India has **66 coastal districts on the mainland**.



- **Western Coastal Plains:**
  - ✓ Submerged coast (city of Dwarka believed to be submerged); narrow & steep coastline.
  - ✓ **Divisions:** Kachchh-Kathiawar (Gujarat), Konkan (Maharashtra), Canara (Karnataka), Malabar (Kerala).
  - ✓ **Special Feature:** Kayals (backwaters) in Kerala's Malabar coast.
  - ✓ **Ports:** This region is **highly suitable for natural harbors**. Major ports include — **Kandla** (in the Gulf of Kutch), **Mumbai**, **Mangaluru**, **Kochi** (the “Queen of the Arabian Sea”), and **Mormugao** (located at the mouth of the Zuari River in Goa).
  - ✓ On the **Malabar Coast of Kerala**, **kayals (backwaters)** are found, which are **unique water formations of this region**.
  - ✓ The **Malabar Coast** has the **largest number of lagoons**.
  - ✓ The **central part of India's western coast** is known as the **Kannad Plain**.

## ➤ **Eastern Coastal Plains:**

- ✓ **Emergent coast;** broader, wide and flat, formed by marine regression.
- ✓ **Numerous major rivers** such as the **Mahanadi, Godavari, Krishna, and Kaveri** have formed **vast deltas** here, which are **extremely fertile and densely populated regions**.
- ✓ **Ports:** Major ports include **Paradip, Tuticorin, and Haldia**.
- ✓ The **northern part of the Krishna River** is called the “**Northern Circars**”.
- ✓ The **Suvarnarekha and Baitarani rivers bifurcate the northern part of the Eastern Ghats**.
- ✓ The **Coromandel Coast** stretches across **Tamil Nadu and Andhra Pradesh**.
- ✓ **Ports:** Fewer ports due to the shallow continental shelf, making harbours less naturally deep.

## The Islands

### ➤ **Andaman & Nicobar Islands (Bay of Bengal):**



- ✓ **Number:** Comprising 572 islands with 38 of them being permanently inhabited.
- ✓ **Total Area:** 8249 square Km
- ✓ **Origin:** Volcanic, with Barren Island being South Asia's only confirmed active volcano. Barren Island Volcano erupted first recorded in 1787, the last major eruption in 1991.
- ✓ **Geological Link:** Extension of the Arakan Yoma range of Myanmar.
- ✓ **Climate & Vegetation:** Equatorial climate with dense tropical forests.
- ✓ **Highest Peak:** The **highest peak of the Andaman and Nicobar Islands** is **Saddle Peak**, located in **North Andaman**, with an **elevation of 738 meters**. The **second highest peak** is **Mount Thullier**, found on **Great Nicobar Island**. The **third highest** is **Mount Diavolo**, located in **Middle Andaman**, and the **fourth highest** is **Mount Koyob**, situated in **South Andaman**.