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General Studies

Paper 1 – Volume 6

Indian Geography



UP - PSC

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INDIAN GEOGRAPHY

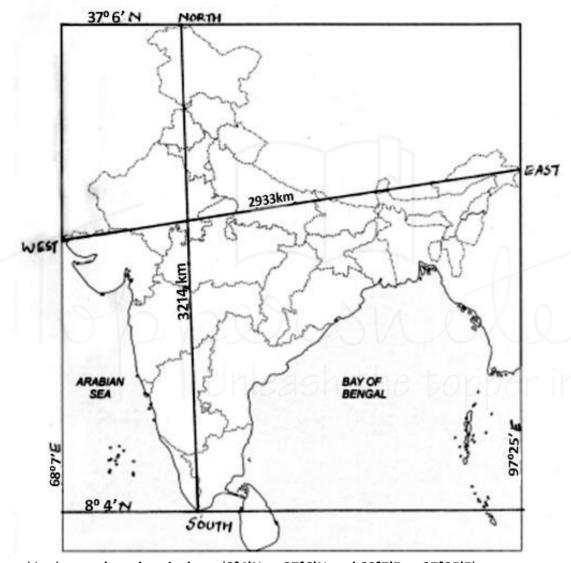
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1 CHAPTER

India -Size and Location





- Situated in the northern hemisphere (8°4'N to 37°6'N and 68°7'E to 97°25'E)
- Bounded by
 - O North: the Great Himalayas
 - West: Arabian SeaEast: Bay of Bengal
 - o South: the Indian Ocean.
- 7th largest country in the world.
- Northernmost point: Indira Col
- Southernmost point: Indira Point in the Andaman and Nicobar Islands.
- Easternmost point: near Kibithu in Anjaw district of Arunachal Pradesh
- Westernmost point: Sir Creek in Kutch, near the "Guhar Mota" in Gujarat.

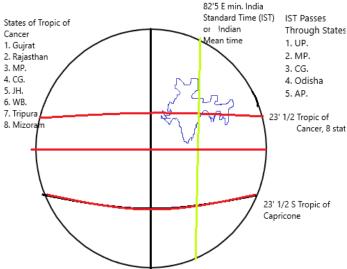


- **Length**: 3214 Km
- Width: 2933 Km (longitudinal difference: 30⁰ or 2 hours)
- Area: 32,87,263 sq. km (2.42% of the world)
- Population: 2nd largest country in the world (17.5% of world's population)
- Total land boundary=15,200 km.
- Total Sea boundary = 7516.5 Km (without islands 6100 Km)
- Border Countries:
 - O North-west: Afghanistan and Pakistan
 - India-Pakistan border: Radcliffe line
 - Pakistan-Afghanistan border: Durand Line.
 - o North: China, Bhutan and Nepal
 - India-China border: McMahon line.
 - O East: Myanmar, Bangladesh (India has longest boundary with Bangladesh)
 - O **South**: Sri Lanka separated by Palk Strait and Gulf of Mannar.
- States sharing International borders:
 - Bangladesh: total boundary= 4096km
 - 5 States: West Bengal, Mizoram, Meghalaya, Tripura, and Assam
 - o China:Total boundary=3488km
 - 3 States and1 UT: Himachal Pradesh, UttarakhandandSikkim andLadakh
 - o Pakistan: Total boundary= 3323km
 - 4 States and1 UT: Jammu andKashmir, Punjab, Gujarat, Rajasthan andLadakh
 - O Nepal: Total boundary= 1751km
 - 5 States: Uttar Pradesh, Bihar, Uttarakhand, Sikkim, West Bengal
 - Myanmar: Total boundary= 1643km
 - 4 States: Arunachal Pradesh, Manipur, Mizoram, and Nagaland
 - Bhutan: Total boundary= 699km
 - 4 States: Arunachal Pradesh, Assam, Sikkim, andWest Bengal
 - Afghanistan:total boundary= 106km
 - 1 UT: Ladakh

Indian Standard Meridian

- 82°30'E Meridian crossing through Mirzapur, UP is India's Standard Meridian.
- Ahead of mean time by 5 hours and 30 minutes.
- Tropic of cancer (23°30'N) passes through - Gujarat, Rajasthan, Madhya Pradesh, Chhattisgarh, Jharkhand, West Bengal, Mizoram, and Tripura.





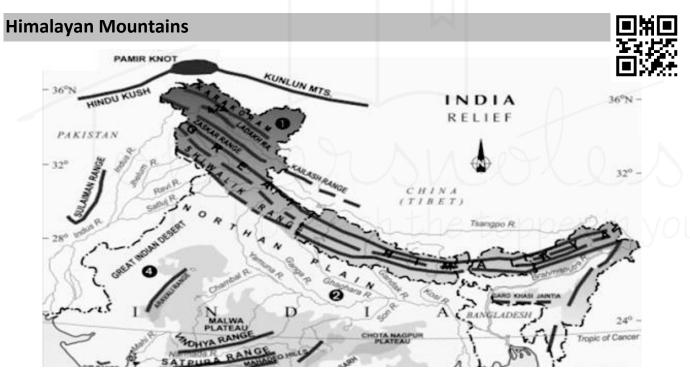


Physiographic Divisions of India



On the basis of physical features, India is divided into 6 physiographic divisions:

- 1. Northern and North-eastern Mountains
- 2. Northern Plain
- 3. Peninsular Plateau
- 4. Indian Desert
- 5. Coastal Plains
- 6. Islands



- Highest andthe youngest fold mountain ranges of the world.
- One of the highest earthquake-prone regions of the world.
- Length: runs west-northwest to east-southeast in an arc 2,500 km long.
 - O Western anchor: Nanga Parbat (lies just south of the northernmost bend of the Indus river)
 - Eastern anchor: Namcha Barwa (lies immediately west of the great bend of the Yarlung Tsangpo River)
- Width: 400 km 150 km (West- east).

Physical Features

 Soaring heights, steep-sided jagged peaks, valley and alpine glaciers often of stupendous size

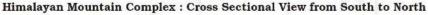




- Topography deeply cut by erosion, seemingly unfathomable river gorges, complex geologic structure, and series of elevational belts (or zones)
- Greater part of the Himalayas lies below the snow line.
- The mountain-building process that created the range is still active.
- Considerable stream erosion and gigantic landslides.

Sub Divisions of the Himalayas





North-South of Himalayas



1. Trans-Himalayan Ranges:

- Location: North of the Great Himalayas
- aka **Tibetan Himalaya** because most of it lies in Tibet.
- Lifted much before the Himalayas b/w Jurassic and Cretaceous
- Geologically not a part of the Himalayas.
- Start from Pamir Knot.
- Godwin Austen/ K2/ Qogir (8,611 m) second highest peak in the world / highest peak in the Indian Union found in Karakoram Range
- Length- 1,000 km in east-west direction.
- Average elevation 5000 m above mean sea level.
- Average width 40 km- 225 km (extremities -central part).
- Siachen glacier highest battlefield.



- Glacier Baltaro- largest mountain glacier from Karakoram range.
- **Karakoram pass** connects the **Aksai Chin** which is an erosional plateau of average height 5000m.
- Main ranges:
 - Karakoram Range :
 - Northernmost range of the Trans-Himalayan Ranges in India
 - aka Krishnagiri range
 - Extends eastwards from Pamir for about 800 km.
 - Average elevation 5,500 m and above.
 - O Ladakh range:
 - North of the Zaskar Range
 - **Highest point** Rakaposhi
 - Lies to north of Leh.
 - Merges with the Kailash range in Tibet.
 - Important passes Khardung La, and Digar La.
 - Zaskar Range
 - A mountain range in the union territory of Ladakh.
 - Separates Zanskar from Ladakh.
 - Average height about 6,000 m.
 - Acts as a climatic barrier protecting Ladakh andZanskar from monsoon pleasantly warm and dry climate in the summer.
 - Major passes- Marbal Pass, Zojila Pass extreme northwest.
 - Major rivers- Hanle River, Khurna River, Zanskar River, Suru River (Indus), and Shingo River.
 - Kailas Range
 - Offshoot of the Ladakh Range.
 - **Highest peak** Mount Kailash (6714 m).
 - River Indus originates from the northern slopes of the Kailas range.

Ladakh Plateau

- Cold desert
- Lies to the north-east of the Karakoram Range.
- Dissected into a number of plains and mountains Soda Plains, Aksai Chin, Lingzi Tang,
 Depsang Plains and Chang Chenmo.
- Northwestern part Deosai mountains are the end of the Trans-Himalayan region

2. Great Himalaya:

- aka Himadri.
- Average height 6000 m
- Average width 25 km
- Extension Mt. Namcha Barwa to Nanga Parbat (2400 km)- one of the longest-running fold mountain ranges in the world.
- **Features:** High relief, deep gorges, vertical slopes, symmetrical convexity, and antecedent drainage.



- Terminates abruptly at the syntaxial bends.
 - O Nanga Parbat north-west
 - O Namcha Barwa north-east.
- Composed of metamorphic and sedimentary rocks.
- Core Batholith representing the intrusion of Magma (Granitic Magma)
- Have asymmetrical folds due to high compression and they have fractured rocks in the eastern part.
- 14 of the 28 tallest peaks in the world (> 8000 m) are situated here.
- Major passes Zojila Pass (connects Srinagar with Leh), Shipki La Pass, Burzil Pass, Nathu La Pass etc.
- Major glaciers Rongbuk glacier (largest in the Himadri), Gangotri, Zemu etc.
- Separated from lesser Himalayas by longitudinal valleys filled with sediments k/a Doons.
 - o Eg. Patli Dun, Chaukamba Dun, DehraDun etc.

3. Middle/Lesser/Himachal Himalaya:

- Most rugged mountain system.
- Lies **b/w** the **Shiwaliks** in the south and the **Greater Himalayas** in the north.
- Composed of highly compressed and altered rocks.
- Average altitude 3,700 4,500 metres.
- Average width 50 to 80 Km.
- Pir Panjal range longest
 - Extends from Jhelum upper Beas river for over 300 km.
 - Rises to 5,000 metres and contains mostly volcanic rocks.
 - O Passes:
 - Pir Panjal Pass (3,480 m), the Bidil (4,270 m), Gulabgarh Pass (3,812 m) andBanihal Pass (2,835 m).
 - Banihal Pass- Jammu-Srinagar highway and Jammu-Baramulla railway.
 - O Rivers :
 - Kishanganga, the Jhelum and Chenab.
 - Important Valleys
 - Valley of Kashmir-
 - b/w the **Pir Panjal** and the **Zaskar Range** (average elevation- 1,585 m)
 - **Composed** of alluvial, lacustrine [lake deposits], fluvial [river action] and glacial deposits. {Fluvial Landforms, Glacial Landforms}
 - **Jhelum River meanders** through these deposits and cuts **a deep gorge** in Pir Panjal through which it drains.
 - Kangra Valley -
 - Extends from the foot of the Dhauladhar Range to the south of Beas.
 - Kulu Valley
 - In the upper course of the Ravi
 - A transverse valley.
- Most important range Dhaula Dhar and Mahabharat ranges.
- Includes famous valley of Kashmir, the Kangra and Kullu Valley in Himachal Pradesh.
 - Well known for its hill stations.
- Cut across by the Jhelum and Chenab river.



- Dhauladhar ranges extension of Pir Panjal into Himachal Pradesh cut across by the river Ravi.
- Mussoorie ranges divide the waters of Sutlei and Ganga
- Have steep, bare southern slopes [prevents soil formation] andmore gentle, forest covered northern slopes.
- Uttarakhand- marked by Mussoorie and Nag Tibba ranges.

Important ranges of Lesser Himalayas	Region
Pir Panjal Range	J&K (south of Kashmir Valley)
Dhauladhar Range	Himachal Pradesh
Mussoorie Range and Nag Tibba Range	Uttarakhand
Mahabharat Lekh	Nepal

4. Sub-Himalayas/Shiwaliks:

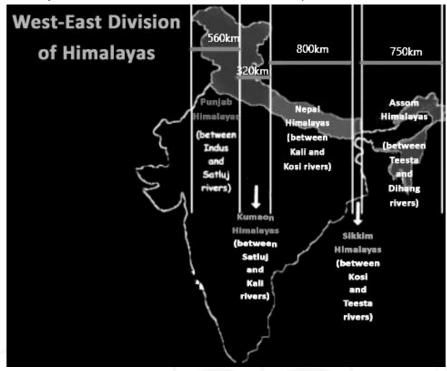
- aka Outer Himalayas.
- b/w Great Plains and Lesser Himalayas.
- **Altitude** 600-1500 metres.
- Length- 2,400 km Potwar Plateau to Brahmaputra valley.
- Southern slopes steep
- Northern slopes gentle.
- Width 50 km 15 km (Himachal Pradesh -Arunachal Pradesh).
- Almost unbroken except for 80-90 km valley of Tista andRaidak River.
- Covered with thick forests from North-East India up to Nepal.
- Southern slopes in Punjab and Himachal Pradesh- almost NO forest cover.
- Highly dissected by seasonal streams Chos.
- Valleys part of synclines and hills part of anticlines
- Different names:

Region	Name of Shiwaliks
Jammu Region	Jammu Hills
Dafla, Miri, Abor andMishmi Hills	Arunachal Pradesh
The Dhang Range, Dundwa Range	Uttarakhand
Churia Ghat Hills	Nepal



Region - wise division of Himalayas

Divided by Sir Sidney Burrard on the basis of the river valleys:



Kashmir /Punjab/ Himachal Himalayas:

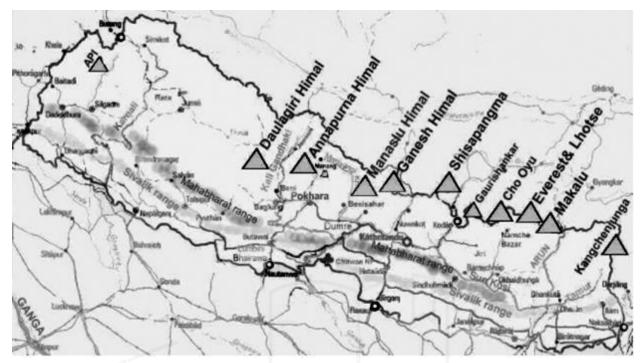
- Located b/w Indus andSatluj gorge
- Length- 560 kms
- Width 320 kms
- Zaskar range northern boundary and Shiwaliks Southern boundary
- Characterised by ridge and valley topography (Kashmir Valley is the syncline basin) formed by the Lacustrine deposits (Karewas- helpful in growing saffron- from Pulwama to Pampore) of Jhelum.
- Major ox-bow lakes Wular lake, Dal lake, etc
- aka "Vail of Kashmir"
- Rainfall upto 100cm in summers and snow during winters
- Only gateway to Kashmir Banihal pass Jawahar tunnel (Second Largest in India)
- Major passes- Burzil pass, Zozila pass.

The Kumaon Himalayas

- Located b/w Satluj andKali gorges
- Length- 320 kms
- Major mountain ranges Nag Tibba, Dhaula Dhar, Mussoorie, and parts of the Greater Himalayas.
- Major peaks Nandadevi, Kamet, Badrinath, Kedarnath, etc.
- Major rivers Gangotri, Yamunotri, Pindari, etc.
- Characteristics:
 - Snowfall in winters
 - Coniferous forests above 3200m and Deodar forest (Deodar forest) b/w 1600-3200m.
 - O Has **tectonic valleys** Kulu, Manali, and Kangra.
 - o Rainfall about 200cm in summers
 - More prone to Seismicity and landslides.



Nepal/ Central Himalaya



- Length- 800 km
- **b/w Kali** in the west and **Tista** in the east.
- Great Himalayas attain maximum height in this portion.
- Major peaks- Mt. Everest, Kanchenjunga, Makalu, Annapurna, Gosainthan and Dhaulagiri.
- Lesser Himalaya k/a Mahabharat Lekh here.
- Major rivers- Ghaghara, Gandak, Kosi, etc.
- Major valleys- Kathmandu and Pokhra lacustrine valleys (previously, lakes).

Assam/ Eastern Himalayas

- Length- 750km
- Located b/w **Tista** in the **west** and **Brahmaputra** (Dihang gorges) in the **east**.
- Occupy mainly Arunachal Pradesh and Bhutan.
- Narrow longitudinal valleys
- Rainfall > 200cms.
- Show a marked dominance of fluvial erosion due to heavy rainfall.
- Landslides, earthquakes are very common as rocks are fractured
- Inhabited by tribes
- Important peaks Namcha Barwa (7756 m) Kula Kangri (7554 m) ChomoLhari (7327 m).
- Major hills Aka hills, Dafla hills, Miri hills, Abor hills, Mishmi hills, and Namcha Barwa, Patkai bum, Manipur hills, Blue Mountain, Tripura range, and Braille range.
- Major passes- Bomdi La, Yong Yap, Diphu, Pangsau, Tse La, Dihang, Debang, Tunga, and Bom La.





Western Himalayas	Eastern Himalayas
Don't act as barrier to south west monsoon	Act as barrier to south west monsoon
Shiwaliks are farther	Shiwaliks are closer

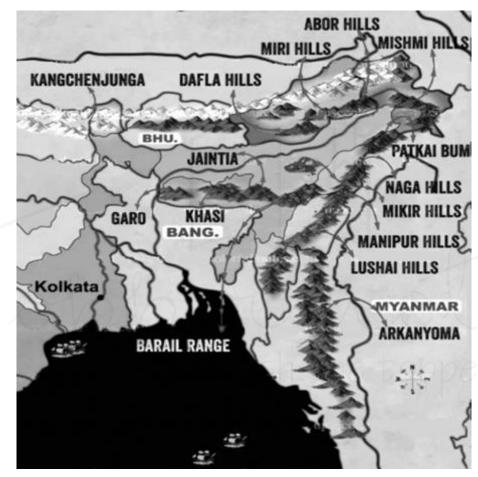
Arunachal Himalayas

- Form the eastern frontier of the Eastern Himalayas.
- Namcha Barwa extreme east of Arunachal Pradesh.
- Earlier k/a Assam Himalayas.
- Himalayan range enters Arunachal Pradesh from Bhutan in the West Kameng district.



Characteristics

- High ridges and low valleys
- O Altitude 800 m to 7,000 m above sea level.
- O **Extend** from east of the Bhutan Himalayas Diphu pass in the east.
- O **Dissected by fast-flowing rivers** like **Brahmaputra** which flows through a deep gorge after crossing Namcha Barwa.
 - **Perennial** highest hydro-electric power potential in the country.
- Major tribes- Monpa, Abor, Mishmi, Nyishi and the Nagas- practise Jhumming.



Purvanchal Himalayas

- Geologically considered part of the Himalayas
- Has structural differences, thus, separated from the main Himalayan ranges.
- Lies south of the Brahmaputra valley.
- Belong to Arakan Yoma orogenesis.
- Have loose, fragmented sedimentary rocks like shale, mudstone, sandstone, quartzite
- Most fractured part of the Himalayas.
- Naga fault line- earthquakes and landslides
- Rainfall 150-200 cms
- Densely forested
- Elevation decreases from north to south.
- Convex to the west.
- Low hills where Jhum cultivation is prevalent.



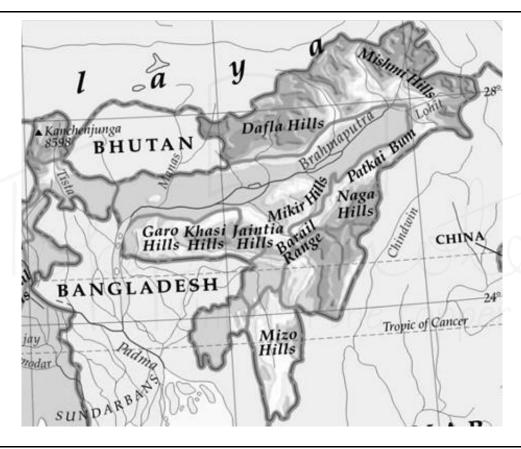
• Major Hills:

Dafla Hills	 Location: north of Tezpur andNorth Lakhimpur Bounded on west by the Aka Hills andon the east by the Abor Range.
Abor Hills	 Location: region of Arunachal Pradesh in NE of India, near China border Bordered by Mishmi Hills and Miri Hills. Drained by the Dibang River, a tributary of the Brahmaputra.
Mishmi Hills	 Location: southward extension of the Great Himalayan ranges. Northern andeastern parts touch China.
Patkai Bum Hills	 Location: India's NE border b/w Arunachal Pradesh and Myanmar. "Patkai" - "to cut chicken" in Tai-Ahom language. Originated by the same tectonic processes that resulted in the formation of the Himalayas in the Mesozoic. Have conical peaks, steep slopes and deep valleys Not as rough as the Himalayas. Whole region is surrounded by forests composed of sandstones.
Naga Hills	 Location: extending into Myanmar forms a divide b/w India and Myanmar. Highest peak - Saramati . Receive a heavy monsoon rainfall and densely forested.
Manipur Hills	 Location: north of Nagaland, Mizoram in the south, upper Myanmar in east and Assam in the west bound Manipur Hills. Border b/w Manipur andMyanmar. Loktak Lake - only floating national park of the world. Keibul-Lamjao national park situated here.
Mizo Hills	 Location- south-eastern Mizoram state. Formerly k/a Lushai Hills . Highest part- Blue Mountain. Part of the North Arakan Yoma system. aka 'Molasses basin' - made up of soft unconsolidated deposits. Shifting agriculture and some terrace cultivation practised.
Tripura Hills	 series of parallel north-south folds, decreasing in elevation to south. Merge into greater Ganges-Brahmaputra lowlands (aka Eastern Plains).
Mikir Hills	 Location- south of the Kaziranga National Park, Assam . Part of the Karbi Anglong Plateau. Mikir Hills - oldest landform in Assam. Radial drainage pattern Major rivers- Dhansiri and Jamuna. Highest peak - Dambuchko.
Garo Hills	 Location: Meghalaya state . Highest peak: Nokrek Peak.



Khasi Hills	Part of Garo-Khasi Range in Meghalaya.
	Cherrapunji - East Khasi Hills .
	Highest peak: Lum Shyllong .
Jaintia Hills	Location: further to the east from the Khasi Hills.
Barail Hill	Location: North Cachar Hill District.
	South-western extension of the Patkai Range.
	Runs in a south-westerly direction from southern Nagaland and parts of
	northern Manipur, up to the Jaintia Hill of Meghalaya.

Andaman and Nicobar islands are extensions of eastern Himalayas.



Ice Ages in India

1. The Dharwar Ice Age:

• Indicated by Moraine deposits and other glaciated topographical features observed in Karnataka, i.e. about 1700 million years ago.

2. The Gondwana Ice Age:

• Indicated by **Telcher Series** (Odisha) of the Gondwana System.

3. The Pleistocene Ice Age:

- Effect of ice age was noticed in the Himalayas, especially in the Karakoram and Greater Himalayan ranges.
- Evidenced by: erratic rocks, boulders, cirques, eskers, rock polishing, buff-coloured sands, and luminated clays inter-stratified among the karewas deposits of Kashmir, Bhadarwa (Doda), and Ladakh.



- Also led to the formation of a number of high altitude glacial lakes like Kailash-Kund , Sanasar
 Lake near Batote, Gulmarg-basin, Sheshnag, and Gangable Lake.
- Peninsular part- no evidence of Pleistocene glaciation

Glaciers and Snowline

Snowline:

- o Lower limit of perpetual snow.
- Depends on: latitude, altitude, amount of precipitation, moisture, slope and local topography.



O Snowline in the Western Himalaya - lower altitude than Eastern Himalaya.

Kanchenjunga in the Sikkim - 4000m,

Kumaon and Lahul - 3600 m

Kashmir Himalayas - 2500m above the sea level.

• Factors responsible for snowline:

Lower **latitude** \rightarrow warmer temperatures \rightarrow higher snowline.

Precipitation - Western Himalayas - low and occurs as **snowfall** whereas **eastern Himalayas -** greater and occurs as **rain**.

Altitude of Snowline in the Himalayas

Himalayan Region	Altitude of Snowline
NE Himalayas (Arunachal Pradesh)	4400 m
Kashmir Himalayas	5200 m to 5800 m
Kumaun Himalayas	5100m to 5500 m
Karakoram	5500 m and above

• Glaciers:

Main Glaciers of India

Glacier	Location	Length
Stachin	Karakoram	75km
Sasaini	Karakoram	68km
Hispara	Karakoram	61km
Biafo	Karakoram	60km
Baltoro	Karakoram	58 km
Chogo Lungma	Karakoram	50km
Khurdopin	Karakoram	47km
Rimo	Kashmir	40km
Punmah	Kashmir	27km
Gangotri	Uttarakhand	26km
Zemu	Sikkim/Nepal	25km
Rupal	Kashmir	16km
Diamir	Kashmir	11km





Current Situation:

- Himalayan glaciers are receding.
- According to the new laro satellite, Himalayan glaciers are melting, 8% advancing and 17% showing no change.
- Commissioned by the environment ministry, the study is different from an IPCC report, claiming without sufficient evidence, that the **glaciers would vanish by 2035**

Important Passes of Himalayas

Passes of J&k and Ladakh







(Jawahar Tunnel): Situated in Pir- Panjal Range. Connects Banihal with Qazigund. Connects Srinagar with Kargil andLeh. Border Road Organization- clears and maintains the road, especially during winter. Burzil pass Srinagar- Kishan Ganga Valley Joins the Valley of Kashmir with the Deosai Plains of Ladakh. Pensi La Connects the Kashmir valley with Kargil. Situated in the Greater Himalayas. A traditional pass from Jammu to Srinagar. Closed after the partition. Shortest roadway access to Kashmir valley from Jammu. Qara Tagh Pass Located in the Karakoram Mountains. A subsidiary of the ancient silk route. Highest motorable pass in the country (5602 m). Connects Leh andSiachen glaciers. Closed during the winter. Chang La Connects Ladakh. Second highest motorable mountain pass in India. North of Mount Godwin-Austen in Karakoram. Connects Ladakh with Xinjiang province of China. Chang-La Connects Ladakh with Tibet. Chang-La Connects Ladakh with Tibet. Khunjerab Pass Khunjerab Pass Khunjerab Pass Khunjerab Pass Kashmir andChina On Indo-China border Ladakh Difficult geographical terrain and steep slopes. Remains closed during the winter season.		
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Connects Srinagar with Kargil andLeh.	(Jawahar Tunnel): • Situated in Pir- Panjal Range.	
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Mintaka Pass • Kashmir andChina	Parpik La	
 Tri Junction of India-China and Afghanistan border 	Mintaka Pass	
		Tri Junction of India-China and Afghanistan border

Passes of Himachal Pradesh

Shipki La Pass	Passes through Sutlej Gorge.
	Connects Himachal Pradesh with Tibet.
	• India's 3rd border post for trade with China (Lipu Lekh & Nathula Pass)
Bara-Lacha Pass	Himachal Pradesh- Leh-Ladakh
	Situated on the National Highway in Jammu and Kashmir.
	Connects Manali andLeh.
Debsa Pass	Joins Spiti and Parvati Valley.
	b/w the Kullu andSpiti of Himachal Pradesh.
	Bypass route of Pin-Parvati Pass.
Rohtang Pass	High road transportation- high jams
	Connects Kullu, Spiti, andLahaul.