UNIT: I

HIMALAYAN REGIONAL GEOGRAPHY
The Himalayas form the highest mountain range in the world, extending 2,500 km over northern India. Bounded by the Indus River in the west and the Brahmaputra in the east, the three parallel ranges, the Himadri, Himachal and Shivaliks have deep canyons gorged by the rivers flowing into the Gangetic plain.

Northern Mountain complex can be divided into two parts. Geographically, Himalayas and trans Himalayas are separate entities.

Parts of Northern Mountain Complex

- Trans Himalayas
- The Himalayas
- The Eastern or Purvachal Hills

Trans Himalayas

Formation

- When Eurassian plate completely subducted the Indian Oceanic plate, continent ocean convergence took place between Indian continental crust and Eurassian oceanic crust which led to subduction of oceanic plate. Basaltic oceanic floor of Eurassian plate went into Indian plate and came out in the form of Andesitic rock on the margin of the plate. This range was formed as ‘Karakoram range’ formed on border of Eurassian. They are not part of Himalayas.

Location

- It is situated to the north of the Great Himalayas. It has Karakoram Ladakh, Zaskar and Kailash mountain range. The Karakoram range is called the backbone of high Asia.
- The mountainous complexities of the Himalayan region can be understood in a simple way with the help of the given figure. The Indus river flows between Zaskar and ladakha ranges. It creates the deepest gorge in India (5200 m deep) by cutting Ladakh range at the place named Bunzi.

Main ranges:

- Zaskar range (India)
- Ladakh range (India)
- Karakoram range (India/Pakistan/China)
- Kailash range (in Tibet)

Zaskar range

- Nanga Parbat (8126 m) and Deosai mountain are important parts of it.
- Situated on the western part of the Greater Himalaya and to the south of Trans Himalaya.


- It is part of the Tethys Himalayas. It extends from Uttarakhand to Jammu and Kashmir.

**Ladakh Range**
- It is about 300 km long and its average elevation is 5800 m.
- Rakaposhi – Harmosh ranges are extension of it.
- South of Ladakh range Indus originates & meets with ‘Syok River’.

**Karakoram range**
- Northern most range of trans-Himalayan ranges are called Karakoram range. They are known as Krishnagiri range. It acts as frontier between India & China.
- Extend from the Pamir, east of the Gilgit River, 600 km long and the average width -120-140 km.
- Trans Himalaya, originally a part of Eurasian plate.
- Abode of largest glaciers in India.
- Siachen, Baltoro, Biafo, and Hisper glaciers.
- Highest peak (in India): K2 or Godwin Austen (8611 m).
- Other important Peaks: Gasherbrum I or Hidden Peak, Broad Peak and Gasherbrum II.
- In the northern limit of Karakoram range lies the Pamir, the Aghil Mountains, and the Yarkand River and in the southern limit lies the River Indus and its tributary Shyok.

**Kailash range**
- It is also called Gangdise in Chinese.
- Kailash range is offshoot of Ladakh range.
- Highest peak is mount Kailash (6714 m).
- Indus river originates from northern slope of Kailash range.

### Location of ranges of Trans Himalayas from North to South

- Karakoram range
- Kailash range (Tibet)
- Ladakh range
- Zaskar range

**The Himalayas**

**Formation**
- Himalayas are formed after the collision of continental crust of Indian plate and Eurasian plate.
- It has been formed due to folding of sediments of ancient thetys sea.
- This process of plate tectonics is ongoing, and the gradual northward drift of the Indian subcontinent still causes earthquakes. Lesser ranges lie just southward from the main body of the Himalayas at both the eastern and western ends.
- The Himalayan system, about 2,400 kilometers in length and varying in width from 240 to 330 kilometers, is made up of three parallel ranges collectively called as the Great Himalayan Range.
  - The Greater Himalayas
  - The Lesser Himalayas, and
  - The Outer Himalayas
- The Greater Himalayas or Himadri has an average elevation of approximately 6,000 meters in height and contain the highest mountains on earth i.e. Mount Everest (8,848 meters) on the China-Nepal border is the highest peak of the World.
- Many major mountains, such as Kanchenjunga (8598 m), Lhotse (8501m), Makalu (8481m), Dhaulagiri(8172m), Mansalu(8481m) ,Cho Oyu (8153m) and Nanga Parbat are part of the Greater Himalaya. Kanchenjunga, is the highest peak of greater Himalayas in India.
• The snow line averages 4,500 to 6,000 meters on the southern side of the Greater Himalayas and 5,500 to 6,000 on the northern side. Because of climatic conditions, the snow line in the eastern Himalayas averages 4,300 meters, while in the western Himalayas it averages 5,800 meters.

**Important Peaks of Greater Himalayas**

<table>
<thead>
<tr>
<th>Peaks</th>
<th>Height</th>
<th>Country/States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mount Everest</td>
<td>8850m</td>
<td>Nepal</td>
</tr>
<tr>
<td>Kanchenjunga</td>
<td>8598m</td>
<td>India</td>
</tr>
<tr>
<td>Lhotse</td>
<td>8501m</td>
<td>Nepal-China</td>
</tr>
<tr>
<td>Makalu</td>
<td>8481m</td>
<td>Nepal-China Border</td>
</tr>
<tr>
<td>Dhaulagiri</td>
<td>8172m</td>
<td>Nepal</td>
</tr>
<tr>
<td>Manaslu</td>
<td>8156m</td>
<td>Nepal</td>
</tr>
<tr>
<td>Cho oyu</td>
<td>8153m</td>
<td>Nepal-China Border</td>
</tr>
<tr>
<td>Nanga Parbat</td>
<td>8126m</td>
<td>Jammu &amp; Kashmir/India</td>
</tr>
<tr>
<td>Annapurna</td>
<td>8091m</td>
<td>Nepal</td>
</tr>
<tr>
<td>Gosainath</td>
<td>8008m</td>
<td>China/Tibet</td>
</tr>
<tr>
<td>Pangma</td>
<td>8013m</td>
<td>China/Tibet</td>
</tr>
<tr>
<td>Badrinath</td>
<td>3300m</td>
<td>India/Uttarakhand</td>
</tr>
<tr>
<td>Nandadevi</td>
<td>7816m</td>
<td>India/Uttarakhand</td>
</tr>
<tr>
<td>Kamet</td>
<td>7756m</td>
<td>India/Uttarakhand</td>
</tr>
<tr>
<td>Gurla Mandhata</td>
<td>7694m</td>
<td>China/Tibet</td>
</tr>
</tbody>
</table>

• **The Lesser Himalayas** or Middle Himalayas or Himachal is located in north- western India in the states of Himachal Pradesh and Uttarakhand, in north-central India in the state of Sikkim, and in north-eastern India in the state of Arunachal Pradesh, ranges from 1,500 to 5,000 meters in height.

• Ranges such as Pir Panjal, Dhauladhar, Nag Tibba, Musoorie, Mabharata Lekh, Kumaon Hills, are part of Middle Himalayas. Many important valleys such as Kashmir valley, Kulu valley and Kangra valley is located in this range.

• Middle Himalayas are marked by meadows which are called ‘Bugyal’or ‘Payar’ in Uttarakhand and ‘Marg’ in Kashmir. Ex: Gulmarg and Sonmarg are such meadows.

• Many doons or duns are found in middle Himalayas such as Dehradun, Jammu dun, and Pathankot dun.

• **The Outer or Southern Himalayas**, averaging 900 to 1,200 meters in elevation, lie between the Lesser Himalayas and the Indo-Gangetic Plain. In Himachal Pradesh and Uttarakhand, this southernmost range is often referred to as the Shiwalik Hills. They are dissected and are not continuous in nature. Jammu hills, Dafla, Miri, Abhor, Mishmi and Churigaon Hills (Nepal) are part of the outer Himalayas. Dhang and Dudhwa Range of Nepal are part of Shiwaliks.
Eastern Hills or Poorvanchal

- Poorvanchal hills are eastern hills which formed during the formation of Himalayas. They form discontinuous ranges from North to South. Hills of Poorvanchal include Patkai Bum (Arunachal Pradesh), Naga Hills (Nagaland), Manipur Hills (Manipur), Mizoram Hills (Mizoram), Tripura hills (Tripura), Barail range (Assam) and Mikir Hills (Assam). The Purvanchal Mountains are composed largely of strong sandstone geological formations.
Features of Himalayan Ranges

- **Himalayan syntial Bend:**
  
  Due to strong push of Aravalli and Assam hills, the weak region of middle Himalayas was pushed and pressed, due to which it became convex shaped which seemed to be hinged at Nanga Parbat (Jammu And Kashmir) and Namcha Barwa (Arunachal Pradesh). This bend is called Himalayan Syntaxial bend.

- **Uneven slopes**
  
  Himalayan southern slopes (Indian side) is less steeper than northern slope (China side). This causes great difference in diversity of flora and fauna on both sides. Indian side is more biologically diverse than Chinese side, which makes it habitable. A large numbers of glaciers rest on southern slope of Himalayas.

**Regional Divisions of the Himalayas**

- The Punjab/Himalaya (560 km long between the Indus and the Satluj rivers)
- The Kumaun Himalaya (320 km long between the Satluj and the Kali rivers),
- The Nepal Himalaya (800 km long between the Kali and the Tista rivers).
- The Assam Himalaya (720 km long between the Tista and Brahmaputra rivers).

<table>
<thead>
<tr>
<th>Regional division of Himalayas</th>
</tr>
</thead>
<tbody>
<tr>
<td>Division Name</td>
</tr>
<tr>
<td>Punjab Himalayas</td>
</tr>
<tr>
<td>Kumaon Himalayas</td>
</tr>
<tr>
<td>Nepal Himalayas</td>
</tr>
<tr>
<td>Assam Himalayas</td>
</tr>
</tbody>
</table>

*See Figure on next page*

**Longitudinal Division of Himalayas**

<table>
<thead>
<tr>
<th>Division Name</th>
<th>Location</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>The western Himalayas</td>
<td>▶ Between the Indus river to Kali river&lt;br&gt;▶ In States of Jammu &amp; Kashmir, Himachal Pradesh and Uttarakhand</td>
<td>880 km</td>
</tr>
</tbody>
</table>
The central Himalayas
- Between Kali river and Tista river
- It extends from Nepal to Sikkim
  800 km

The Eastern Himalayas
- Between the Tista and the Brahamputra
- It extends from Arunachal Pradesh to Bhutan
  720 km
### Important Passes of Himalayas

#### Jammu and Kashmir

- **Mintaka Pass** - It lies near the trijunction of India-China and Afghanistan border and joins north Kashmir with China.

- **Banihal Pass** - It is situated at an elevation of 2832 m across the Pir-Panjal Range. It remains snow covered during winter season and cannot be used as a transport route in that season. To provide round-the-year transport facilities between Jammu in South and Srinagar in the north, a tunnel named as The Jawahar Tunnel (after Pandit Jawaharlal Nehru, the first prime minister of India) was inaugurated in December, 1956. Another 11 km long tunnel provides railways link between Banihal and Kazigund. It was thrown open to railway transport in July, 2013.

- **Khardung La** - This pass is situated at an altitude of 5602 m near Leh in the Ladakh range. The world's highest motorable road passes through this pass. However, this road remains closed in winter due to heavy snowfall.

- **Lanak La** - Located near the border between India and China at an altitude exceeding five thousand meters in the Akasai-Chin area of Jammu and Kashmir, this pass provides passage between Ladakh and Lhasa. A road to connect Xinjiang Province with Tibet has been constructed by the Chinese.

- **Pir-Panjal** - Lying across the Pir Panjal range, it had been a traditional pass on the road and provides the shortest and the easiest metalled road between Jammu and Kashmir Valley. But this route had to be closed down as a result of partition of the subcontinent.

- **Zoji La** - It is located at an altitude of 3850 m above sea level and provides an important road link between Srinagar on one side and Kargil and Leh on the other side. The road passing through this pass has been designated as National Highway (NH-1 D). Border Road Organization (BRO) is responsible for maintaining the road and clearing it off snow during winter. In spite of all these efforts, the road through this pass remains closed from December to mid-May.

#### Himachal Pradesh

- **Bara Lacha La** - This mountain pass is situated at an altitude of 4883 m and provides passage between Himachal Pradesh and Jammu and Kashmir. National highway connecting Mandi in Himachal Pradesh with Leh in Jammu and Kashmir passes through this pass. Being situated at high altitude, it remains snow covered in winter and is not used as a transport route.

- **Debas Pass** - Situated at an elevation of 5270 m above sea level in the Greater Himalayas, it provides a link between Kullu and Lahul and Spiti districts. It offers a much easier and shorter alternative route to traditional Pin-Parbati Pass route between Kullu and Spiti.

- **Rohtang Pass** - It is located at an altitude of 3979 m and provides road link between Kullu, Lahul and Spiti Valleys. Border Roads Organisation (BRO) is responsible for constructing and maintaining the road.
maintaining roads in this area. Rohtang pass is a great tourist attraction and traffic jams are very common because this route is widely used by military, public and private vehicles.

- **Shipki La** - It is located at the Indo-China border at an altitude of over 5669 m in Kinnaur district provides a road connection between Himachal Pradesh and Tibet. It remains snow bound for most of the winter season and is not available for transport. River Satluj enters India near this pass.

- **Uttarakhand**
  - **Lipu Lekh** - Situated near the trijunction of Uttarakhand (India), Tibet (China) and Nepal borders, in Pithoragarh district, it provides a link between Uttarakhand and Tibet. This pass is used by pilgrims to Kailash-Mansarovar. Use of this pass becomes difficult due to landslides in the rainy season and avalanches in the winter season.
  - **Manu Pass** - Situated a little north of the holy place of Badrinath at an elevation of 5610 m near the indo-China border in the Greater Himalayas, this pass connects Uttarakhand with Tibet. It remains closed for six winter months in the year due to heavy snowfall.
  - **Mangsha Dhura** - Situated at an altitude of over five thousand meters at the Indo-China border in the Greater Himalayas in Pithoragarh district, this pilgrims going to Kailash-Mansarovar. Landslides during the rainy season and avalanches during the winter season pose great threat to pilgrims using of this route.
  - **Niti Pass** - Located at an altitude of 5068 m at the Indo-China border across the Greater Himalayas, this pass joins Uttarakhand with Tibet. It remains snow covered and hence closed to traffic from November to mid-May.

- **Sikkim**
  - a) **Nathu La** - Situated at an altitude of 4310 m on the Indo-China border, it forms part of an offshoot of the ancient Silk Route. It connects Sikkim with Tibet and is an important trade route between India and China. It was closed after the Chinese aggression on India in 1962 but was reopened in 2006 as the governments of the two countries decided to enhance their trade through land routes.
  - b) **Jelep La** - It lies at the Sikkim-Bhutan border at an altitude of 4538 m and passes through Chumbi Valley. This pass provides an important link between Sikkim and Lhasa.

- **Arunachal Pradesh**
  - **Bom Di La** - Situated at an altitude of 4331 m near the eastern boundary of Bhutan in the Greater Himalayas, this pass connects Arunachal Pradesh with Lhasa. It is snowbound in winter and remains closed for traffic.
  - **Dihang pass** - Situated at an elevation of more than 4000 m it provides passage between Arunachal Pradesh and Myanmar.

**Significance of Himalayas**

- **Tourist Abode**
  - The Himalaya exercise a dominating influence on the meteorological conditions of India as over its physical geography, vitally affecting its air and water circulation system and, through these, the distribution of life. The high snowy ranges have moderating influence on the temperature and humidity of northern India. When the neighboring lands are suffering from scorching heat in summer, the lower and upper ranges of the Himalaya, because of their height, enjoy a very cool and pleasant climate. Owing to the intense heat in the plains, India has developed a number of hill stations, especially on the Siwalkis, which lies at about 2,000-2500 meters except for the minor ones at 1,000-1,600 meters in Central India. These attract a large number of tourists during spring and summer season. The enchanting
beauty of the people, the prospects of living in luxurious houseboats, the scenic beauty all round, the facilities for skiing and skating, mountaineering have all conspired together to make Kashmir valley a paradise among the world's famous tourist resorts. Other valleys of similar importance are the Kishtwar, the Chamba the Kulu, the Kangra and many others.

- **Climatic Influence:**
  - The Himalaya mountain isolate the deeper interior of Asia from the influence of warm air from the south, and it protects India from the cold blizzards generated by the continental winter high pressure system of north eastern and central Asia.
  - To the Himalaya India owes the prominent features of the climate. By reason of its altitude and situation directly in the path of monsoon, it is most favourable condition for the precipitation of all their contained moisture either rash rain or snow. It intercepts the monsoon clouds advancing from the southern seas, and precipitates heavy rains on the India plains.

- **Birth Place of rivers**
  - Snow fields and glaciers of enormous magnitude are nourished on the higher ranges which, together with the rainfall in the middle Himalaya feed a number of perennial rivers which course down to the plains in hundreds of fertilizing tributaries. The Sacred Rivers along with numerous tributaries have their sources here. Without Himalaya, India would have been a bleak country with no big rivers and no rainfall. Source of Fertile Soil
  - Running water and forest have been constantly eroding the great Himalaya ranges. This debris, after being removed by numerous rivers, is ultimately deposited over the great plains of northern India. The fertile plains of the Punjab, Haryana, Uttar Pradesh, Bihar, West Bengal and Assam have all been the product of this eroded material producing a wide variety of agricultural crops.

- **Richness of Fauna and Flora:**
  - The Himalayan region is very rich in animal and forest resources. In the front of the outer Himalaya lies the Tarai Jungle, the abode of many wild beasts like yak, leopard, bear, and sambhar on the west-panthers and tigers in the central parts; and elephants, tigers and mithuns on the east. These attract a larger number of hunters and provide good game. Besides owing to a variety of climatic conditions the Himalaya is rich in forest resources. On the lower reaches are largely found the tropical and subtropical forests yielding good timber, while on the middle and upper reaches are found the coniferous and deciduous soft and hard woods, yielding wood for match sticks, paper pulp resin, turpentine oil, and various medicinal herbs, etc.

- **Source of water supply and Hydroelectricity**
  - The Himalaya gives birth to mighty rivers whose waters have been utilized for purposes of irrigation and latterly for power. The Yamuna Canal and the harnessing of the Sutlej and other five Punjab rivers made India dependent more than ever on the resources of the Himalaya. The economy of the Punjab and the western desert region of Rajasthan and western region of U. P. became related to the flow of water from these mountains. Now, new centers of pilgrimage are springing up in these parts. These are the sites where large projects (known as the multipurpose schemes) have been and are being developed. The Mandi project was the first attempt in this; line the post independence schemes, the Bhakra Nangal, the Kosi, and the Rihand dam project have the generation of electric power as one of their main purposes. Tons, Ram Ganga, Sharda, Gandak and many other Himalayan rivers are being harnessed. Huge potential of power resources awaits exploitation.

- **Storehouse of Mineral Resources**
  - The Himalaya region contains Himalayan region contains commercially valuable minerals. Copper, lead, zinc, bismuth, antimony, nickel, cobalt and tungsten are known to occur in both
the eastern and western Himalayan and more than 100 different localities. The Himalaya promise gold, silver and precious and semi precious stones (including sapphires, beryl, and kynite), limestone, bauxite, gypsum, bentonite and magnesite. Coal and petroleum are other mineral fuels founded in the region.

- **Other Economic Resources**
  - On the lower slopes of the Himalaya (particularly in Kashmir and Himachal Pradesh) green pastures have made sheep and goat rearing an important occupation of the Gadi shepherd, Sericulture is also carried on. Pashmina wool is obtained from Kashmir. With the integration of these areas into larger viable units after India's Independence, the layout of the roads (Jammu-Srinagar and India Tibet Road) and railways and the establishment of other modes of the communications in this region have paved the way for economic development of some of these regions. By and large, the vast wealth of the Himalayan region lying in is rivers and forests and its minerals, remains yet to be fully exploited.