Physiography of India

1. Main Physiographic Divisions:

India can be divided into 5 major physiographical divisions

- The Himalayan Mountains
- The Great Indian Plains
- The Peninsular Plateau
- The Coastal Plains
- The Indian Islands

2. The Himalayan Mountains

2.1 Introduction

- Youngest and loftiest mountain chain in the world
- Stretches over 2400Km (22° longitude)
- Width varies from 500km in Kashmir to 200Km in Arunachal Pradesh
- Area covered 5 Lakh Km^2
- Pamir knot is the connecting link between Himalayas and the high ranges of central Asia

2.2 Physiographic Divisions of the Himalayas – Divided into 3 parts

2.2.1 The Himalayan Ranges

2.2.1.1 The Shiwaliks

- Outer Himalayas
- Hogback appearance with steep southern slopes
- **Width** varies from 50 Km in Himachal Pradesh to 15 Km in Arunachal Pradesh
- **Altitude** varies from 600-1500 m.
- Gorges of Tista and Raidak have jointly formed a gap of 80-90 Km, in the otherwise unbroken range
- This range, being created last, at some point obstructed courses of river draining from higher reaches and lakes were created

- These lakes drained out after the rivers carved out a course through the Shiwaliks
- 'Duns'or 'Doons'left behind in the West and 'Duars'in the East.
- The southern slopes of this range in Punjab and Himachal Pradesh, are completely devoid of forests, and are dissected by several seasonal streams called 'Chos'
- The Shiwaliks are **known by different names** in different regions
    - Jammu Hills in Kashmir
    - Dhang, Dhundwa in Uttarakhand
    - Churiaghat in Nepal
    - Miri, Dafa, Abor, Mishmi in Arunachal Pradesh

2.2.1.2 The Himachals

- Intricate system of ranges 60-80 Km **wide**
- **Altitude** varying from 3500-4500 m.
- Steep, bare southern slopes and gentle forested northern slopes
- Important ranges are
    - Pir Panjal (Kashmir)
    - Dhauladhar (Himachal Pradesh)
    - Moussourie, Nag Tibba (Uttarakhand)
    - Mahabharat, Lekh (Nepal)
- Pir Panjal range extends from the Jhelum river to the upper Beas river (300-400 Km)
- It is separated from the Zanskar range by the **Kashmir valley** (135 Km long 40 Km wide)
- Other notable valleys are Kangra, Kullu (Himachal Pradesh) and Kathmandu valley (Nepal)
- **Best known passes** of the Pir Panjal range are – Pir Panjal pass, Banihal pass, Bidil pass, Golabghar pass
- Middle Himalayas are friendly to human contact, **majority of Himalayan hill resorts** – Shimla, Mussourie, Almora, Ranikhet, Nainital, Darjeeling are located here

2.2.1.3 The Himadris

- Northernmost or innermost of all the Himalayan ranges
- **Average elevation** of 6100 m

- **Average width** of 25 Km
- Abrupt termination or **Syntactical bend** in the Namcha-Barwa in the north east and the Nanga Parbat in the north west
- **Most of the notable peaks** of the Himalayas lie in this range
- **Major passes** of this range are Burzil, Zozila, Bara Lacha, Shipki La, Nathu La, Jelep La, Bomdi La

2.2.2 The Trans Himalayan Ranges

- The Himalayan ranges immediately north of the Himadri are called the Trans Himalayas or Tibetan Himalayas
- **Zaskar**, **Ladakh**, **Karakoram** and **Kailash** are the main ranges of the trans Himalayas
- **Zaskar** range Branches off from the great Himalayas at 80 E longitude, runs parallel to it, terminates at Nanga Parbat (8126 m)
- The **Ladakh** range lies to the north of the Zaskar range
- It is about 300 Km long, average elevation is 5800 m.
- The **Kailash** range in western Tibet is an offshoot of the Ladakh range
- Mt. Kailash (6714 m) is the highest peak of Kailash range
- Northernmost range of the Trans Himalayas is the **Karakoram** range or Krishnagiri range
- K_2 is the highest peak of the Karakoram range
- **Ladakh plateau** lies to the north west of the Karakoram range, elevation about 5000 m.

2.2.3 The Eastern Hills

- Himalayas take a sudden southern turn after crossing the Dihang gorge.
- Extends from Arunachal Pradesh to Mizoram, forms India's boundary with Myanmar
- **Patkai-Bum** in Arunachal Pradesh
- **Kangto** is the highest peak of Arunachal Pradesh
- Merges into the **Naga hills** of Nagaland
- **Saramati** is the highest peak of Naga hills (3826 m)

- South of Naga hills are the **Manipur hills**.
- **Barali** range separate Naga hills from Manipur hills
- South of Manipur hills are the **Mizo hills** (Lushai hills)
- Highest point is the **Blue Mountain** (2157 m)

2.3 Karewa Deposits

- Intermountain valley fill, (lacustrine deposits) made up of unconsolidated grovel and mud
- Formed during Pleistocene period
- Famous for farming of saffron, nuts etc.
- Kashmir valley is known for its Karewa deposits
- Thickness of Karewas is about 1400 m

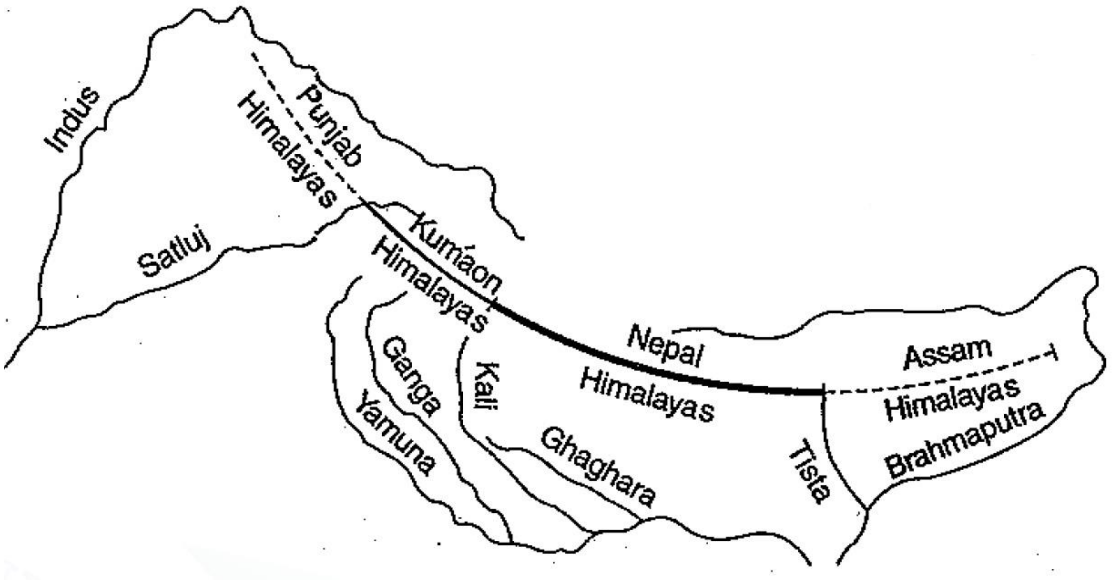
2.4 Himalayan Glaciers

Name	Length (Km)	Location	Mountain Range
Siachen	75	Nubra Valley	Karakoram
Fedchenko	74	S.W Pamir	Karakoram
Hispar	62	Tributary of Hunza	Karakoram
Biafo	59	Brabloh valley	Karakoram
Batura	58	Hunza	Karakoram
Baltoro	58	Hunza	Karakoram
Chogo Lungma	50	Rakaposhi Range	Karakoram
Khurdopla	47	Shingshal Valley	Karakoram
Sonapani	15	Chandra Valley	Pir Panjal
Bara Shigri	10-20	Chandra Valley	Pir Panjal
Rakhiot	15	Nanga Parbat	Pir Panjal
Gangri	13	Nun Kun Massif	Pir Panjal
Chungpar	13	Nanga Parbat	Pir Panjal
Gangotri	30	Source of Ganges (UK)	Kumaon
Milam	20	Gori Ganga (UK)	Kumaon
Pindari		(UK)	Kumaon
Yepokangara	13.5	Gosaithan	Central Nepal

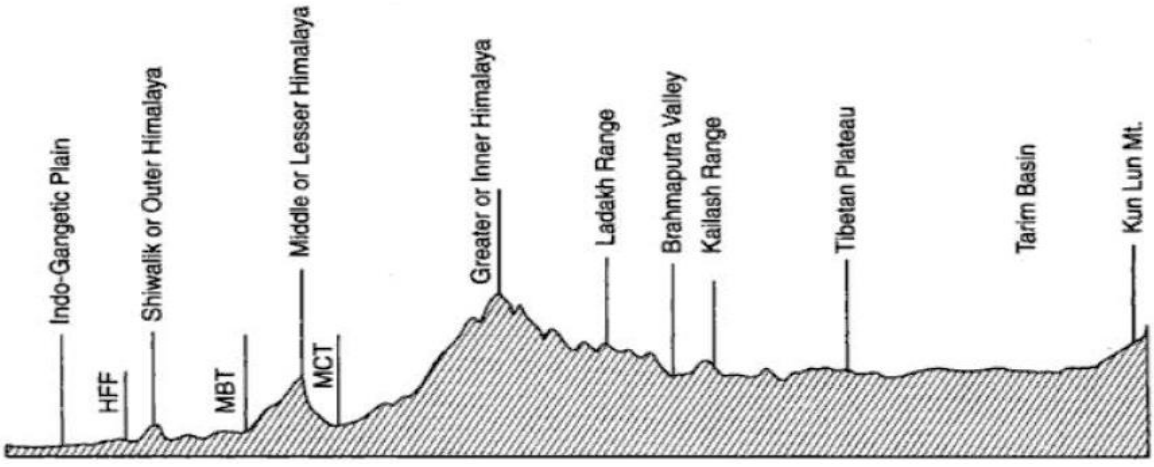
Lidanda	11	Mansalu	Central Nepal
Chhuling	11	Mansalu	Central Nepal
Rongbuk	52	Tibetan side of Everest	Kanchenjunga
Zemu	25	Zemu valley (Teesta)	Kanchenjunga

2.5 Regional Division of the Himalayas

- Proposed by Sydney S. Burrard
- Himalayas divided into 4 parts based on river valleys



2.6 The Himalayan Complex



3. The Great Indian Plains

3.1 Introduction

- Lies to the south of the Himalayas and to the north of the Indian Peninsular region.
- Arcuate (Bow shaped) plain known as Indo-Gangetic-Brahmaputra plains
- Length of 3200 km
- Width varies from 150 km to 300 km.
- Thick layer of alluvium throughout the length and breadth of the plain
- Classic example of aggradational plain.
- According to Oldham, maximum depth of alluvium is 6100 km.
- Average elevation about 200 m.
- Highest elevation of 291 m between Saharanpur and Ambala.

3.2. Geomorphology of the plain

3.2.1. The Bhabar

- Narrow belt about 8-16 km wide running in east-west direction along the foot of the Shiwaliks
- It forms the northern boundary of the great plains
- Rivers descending from the Himalayas deposit their load along the foothills in the form of alluvial fans.
- High porosity of the pebble studded rocks causes the streams to flow underground
- Not suitable for agriculture

3.2.2. The Tarai

- 15-30 km wide marshy tract to the south of the Bhabar region
- It runs parallel to the Bhabar region
- It is marked by the re-emergence of the underground streams of the Bhabar belt
- Re-emerged waters convert large areas along the rivers into ill-drained marshy lands
- Covered with thick forests giving shelter to various wildlife
- The Tarai is more marked in the eastern part as it receives more rainfall

- Most of the tarai specially in Punjab, Uttar Pradesh have been reclaimed and turned into agricultural land
- Yields good crops of sugarcane, rice, wheat.

3.2.3. The Bhangar

- Composed of old alluvium of the Middle Pleistocene age
- Forms the alluvial terrace above the level of the flood plains.
- Often impregnated with calcareous concretions known as 'kankar'
- Remnants of the Bhangar are eroded by change in direction of river channels and levelled down by their meandering tendencies
- Contains fossils of animals like rhinoceros, elephant, hippopotamus etc.

3.2.4. The Khadar

- Composed of newer alluvium
- Forms the flood plains along the river banks
- New layer of alluvium deposited by river floods almost every year
- These deposits are confined to the vicinity of the present river channels
- The clays have less 'kankar'

3.2.5. The Reh or Kellar

- Barren saline efflorescence of drier areas of Uttar Pradesh and Haryana
- Reh areas have spread in recent time due to increase in irrigation

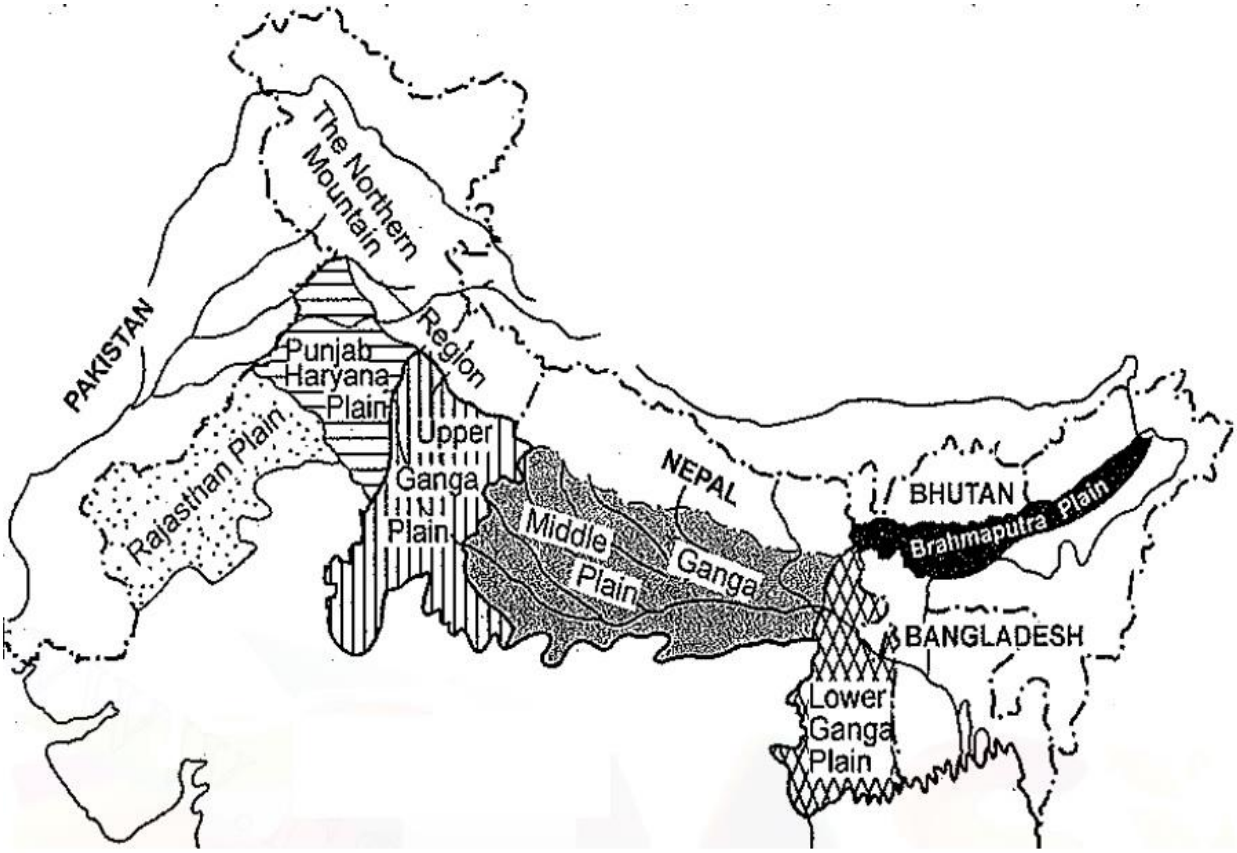
3.2.6. The Bhur

- Elevated piece of land situated along the banks of the Ganga river, especially in the Ganga-Yamuna doab.
- This has been formed due to accumulation of wind-blown sands during the hot dry months of the year

3.3. Regional Division of the Great Plains – Divided into 4 major regions

- The Rajasthan plain

- The Punjab-Haryana plains
- The Ganga plain
- The Brahmaputra plain



3.3.1 The Rajasthan plains

3.3.1.1. Introduction

- Located in between the Aravalli range and the Sutlej and Indus plains
- Height Gradually diminishes from the Arvallis in the south east (350 m) to the Pakistan plains in the north west (150 m)
- In the lower areas and to the north of Jaisalmer, some salt lakes or Ranns can be seen.
- Lake Sambar is the largest lake of this region

3.3.1.2. Division – Can be divided into 5 sections

3.3.1.2.1. Bagar

- The foot area of the Aravallis i.e. the easternmost region of the Rajasthan plains is known as Bagar
- Almost all the region is covered in grass and some agriculture is seen

3.3.1.2.2. Rohi

- Lies to the immediate west of the Bagar region
- Some rivers have originated from the western slopes of the Aravallis
- These rivers have dried up and have merged into the desert region
- Alluvial deposits on both sides of these rivers, makes the basins fertile
- These fertile lands are known as Rohi

3.3.1.2.3. Little Desert Region

- Located to the immediate west of the Rohi region
- Marks the beginning of the desert

3.3.1.2.4. Stony Region or Hamada

- Lies to the north of the little desert region
- Made up of sandy soft rock deposits

3.3.1.2.5. Sandy Region

- Located to the West of the stony region
- This region is the great Indian Thar desert, which has crossed over into Pakistan
- This region is also known as **Marusthali**
- **Dhrian** – Moving sand dunes
- **Dhand** – Longitudinal lakes in between two parallel sand dunes

3.3.2. The Punjab-Haryana plains

- Desert region gives way to the fertile plains of the Punjab-Haryana.
- Length 640 Km, and 300 Km wide (East-West)
- Eastern boundary formed by the Yamuna river
- Elevation varies from 300 m in the north to 200 m is the south east

- This plain is formed by the alluvial deposits of 5 rivers i.e. Sutlej, Beas, Ravi, Chenab and Jhelum.
- It is primarily made up of doabs (land between rivers) from east to west these doabs are
    - Bist-Jalandhar doab (Beas and Sutlej)
    - Bari doab (Beas and Ravi)
    - Rachna doab (Ravi and Chenab)
    - Chaj doab (Chenab and Jhelum)
    - Sind sagar doab (Jhelum-Chenab and the Indus)
- The long depositional process of the rivers has united these doabs and given a homogeneous geomorphological identity to the entire area
- Mass of alluvium has been broken by the river courses.
- River courses have carved broad flood plains of khadar flanked by bluffs known as **dhayas**
- These bluffs are as high as 3 m or more are heavily gullied
- The khadar belt known as **bet lands**, though liable to flooding is agriculturally valuable
- Northern part of the plains bordered by the shiwaliks has been intensively eroded by several streams called **chos.**
- **Chos** are particularly noticeable in the Hoshiarpur district of Punjab.
- Area between Ghaggar and Yamuna river lies the so called **'Haryana tract'**, which acts as a water divide between Yamuna and the Sutlej rivers
- Only river between Yamuna and the Sutlej is the Ghaggar river, which is considered to be the present-day successor of the legendary **Saraswati** river.

3.3.3. The Ganga Plain