INDIAN PHYSICAL AND ECONOMIC GEO

Physical Settings & Resources

1. Physiographic regions of India (relief)
2. Drainage - system, Pattern, Basin
3. * Climate
   - Season cycle, regions
4. Indian biomes
   - Vegetation (forest resources)
   - Wildlife (wildlife resources)

Deforestation + Desertification → Forest Cons° Act 1980 → green India Mission

* ISFR 2021

WL Protection Act 1972

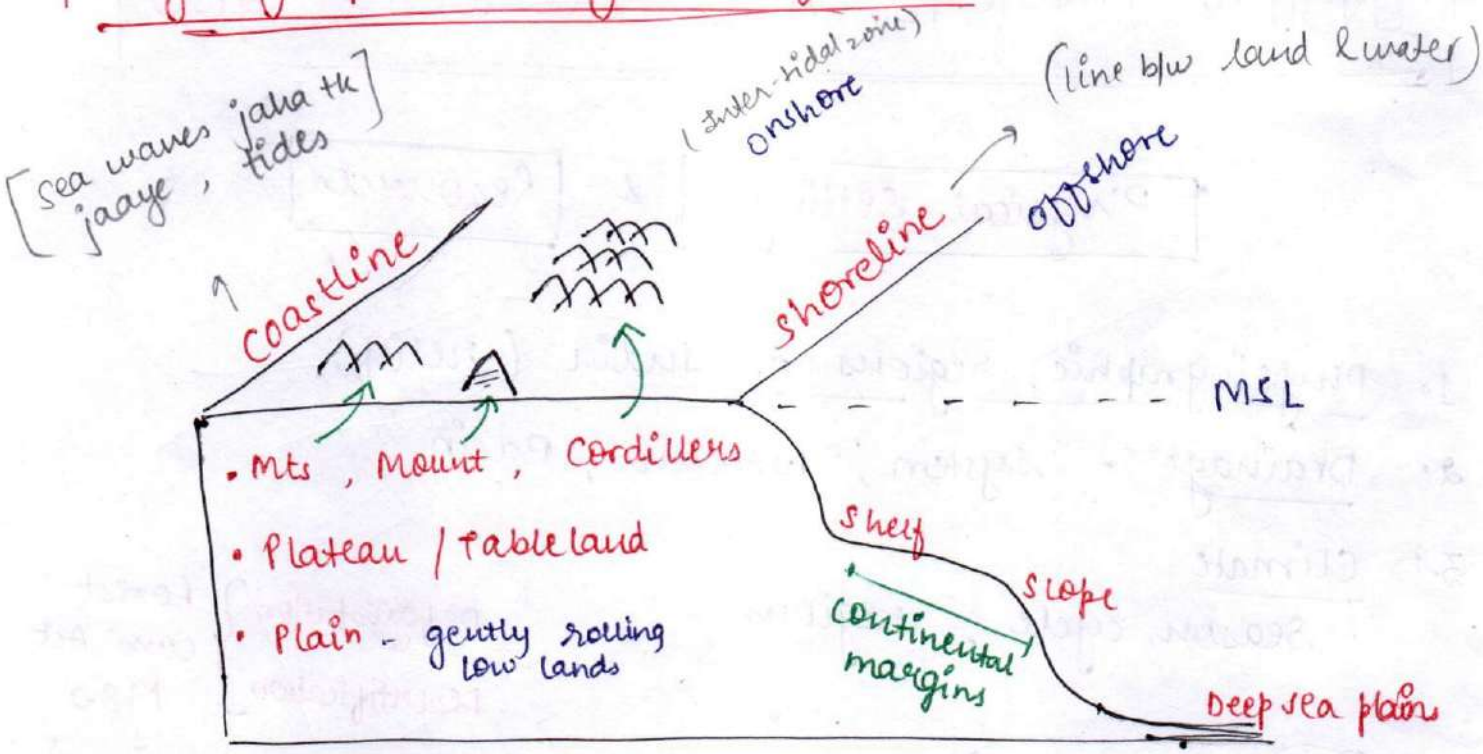
5. Structure (Geological)
   - Mineral
   - Energy
   - Nuclear

   } resources

Archaen system
Aryan system → Deccan trap

6. Soil

Physiographic regions of India



Upland ← conical

Flat topped

* Chorochromatic map - colour as conventional ~~map~~ symbols

- Geological survey of India identifies 5 physiographic units in the country.

- These includes -

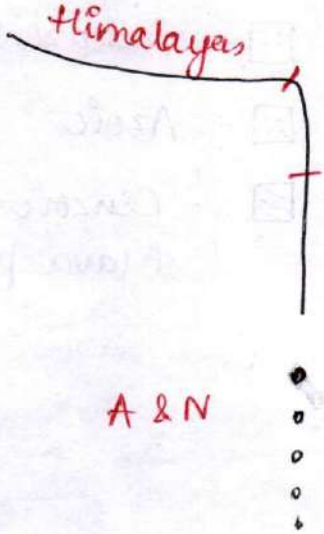
  on shore - Plateau, Mountain & Plain and

  off shore - Islands & Continent margins

- Ancient - Azoic - 4000 million yrs ago (beginning from) - Plateau
- Old - Paleozoic - 600 m yrs ago - Mt.
- Young - Cenozoic - 70 m. yrs ago - Mt.
- Youngest - Neozoic → Pleistocene - 1 m yrs ago - Plain
  → Holocene - 10,000 yrs B.P (epochs)

Chronologically (Time)

↓ offshore
↙ Islands
↘ Continent margins

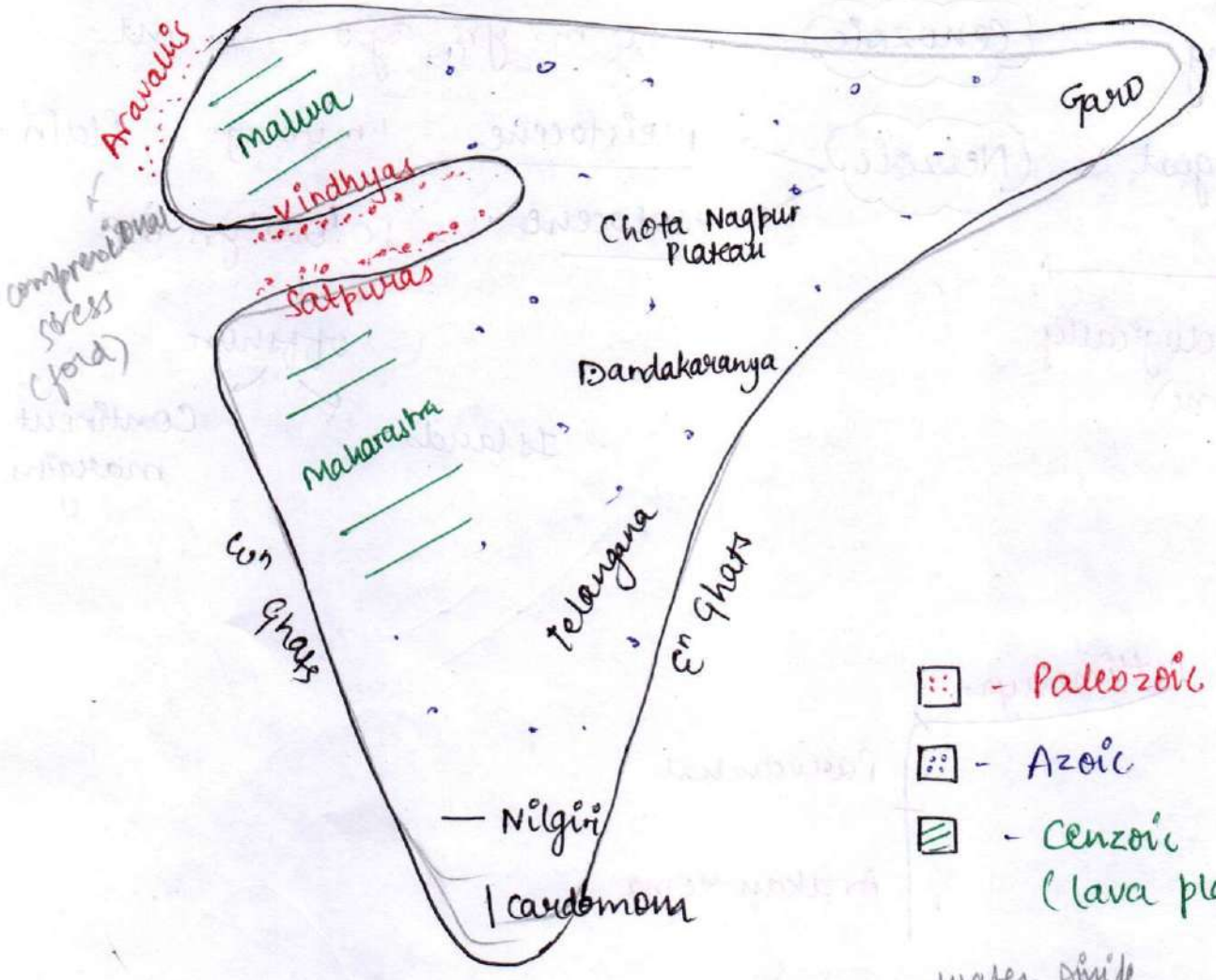


→ Islands are youngest bcz they are submerged into water after melting of ice / rise MSL (after ice age) so their formation is youngest.

Vindhyan & Satpura - Old block mountains

Maharastra Plateau is azoic but now it is Cenozoic for lava form. that makes it
↓
magma ejection ki vja se.

Plateau



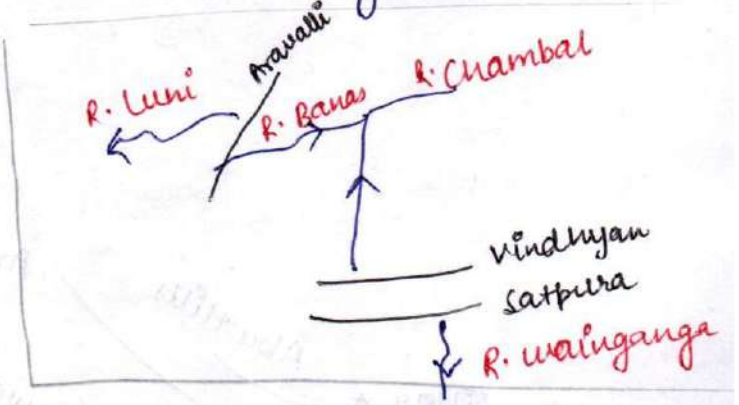
water divide
elevated feature which tends to divide flow of stream into 2 direction

Plateau

- Central Highlands (~~Azoic~~) (Paleozoic)
  - Aravallis
  - Vindhyans
  - Satpurs
  - → National water divide
- Peninsular Plateau
  - Deccan Plateau
    - Ghats — E^n → W^n
    - S^n hills
    - Interior Plateau
  - Other uplands (Ancient but Cenozoic)
    - Malwa
    - Chota Nagpur Plateau
    - Far E^n uplands
    - * Kathiawar

(True ancient)

- The oldest physiographic unit of the country.
- is positioned in major part of Indian peninsula
- Though the genesis of this relief is defined in Azoic era, it involves paleozoic and cenozoic developments as well.
- This physiographic unit is sub-categorised as
  a) Central highlands
  b) Peninsular Plateau



Central highlands

- These are paleozoic constructs of Indian peninsula.
- They commonly represent national water divide. (water divide is defined to be the elevated area which separates flow of rivers along its slope).

largest inland drainage

Aravalli separating River Luni and R. Banas, incomparison Vindhyans & Satpuras separating Extra peninsular rivers as R. Chambal and peninsular rivers - R. Wainganga.

- **Aravallis**

↳ are old fold mountains of the country that are significantly eroded.

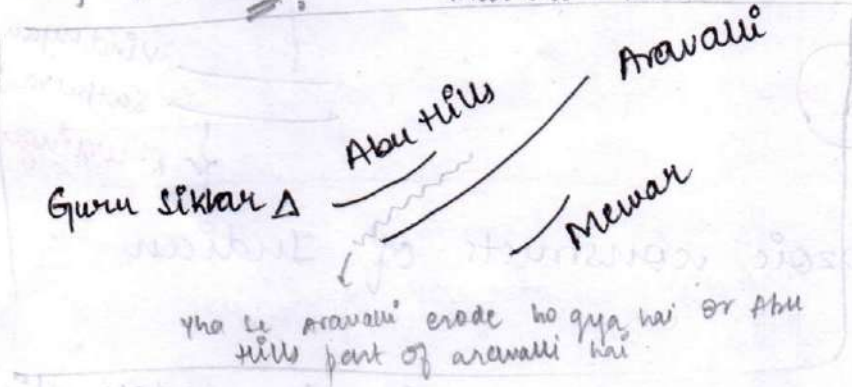
↳ Extending from Delhi to Ahmedabad, it forms

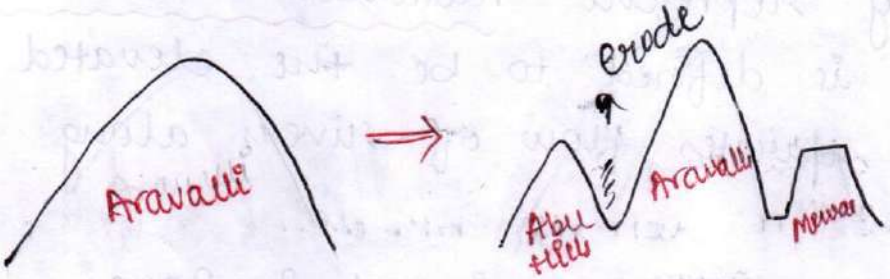
N. western boundary of Indian plateau.

- It involves recognizable height only in Rajasthan where (Abu Hills) have highest peak of this mountain Guru Sikhar.

- Aravalli also include extremely low-lying dissected part called Mewar Plateau.
  (that part of Aravalli that eroded & lost its conical (edge) structure)

Why Aravallis? → Aravali + Abu hills + Mewar

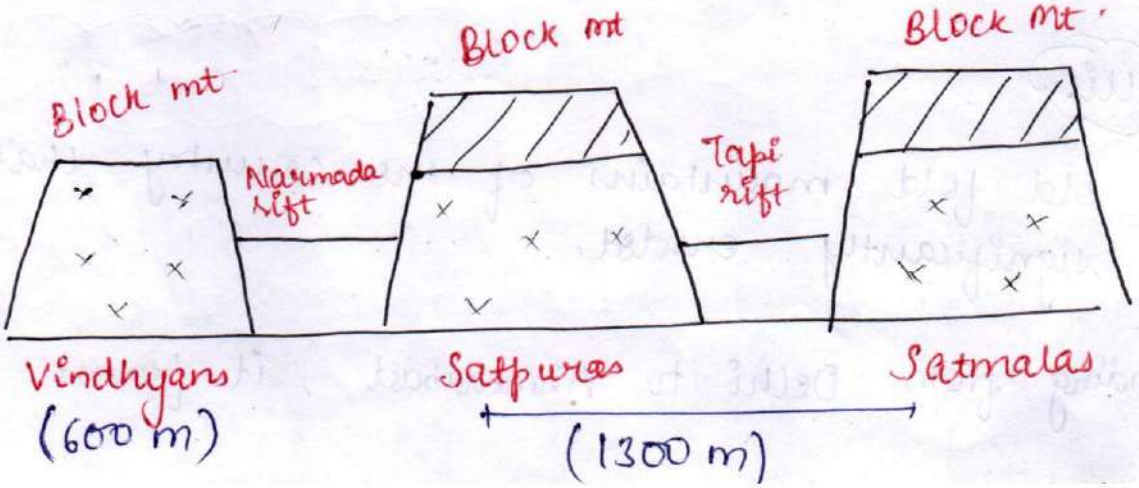




- Vindhyans and Satpuras

multiple faulting

▨ - Lava sheets
▩ - Limestone



satpura is taller bcz it has developed lava sheet or cenozoic modification and not bcz vindhyans eroded more.

why vindhyas ? → Vidyan / Vindhyan scrapland + Baghelkhand.

Vindhyan range :-

- is northern most, low lying limestone made block mountain of the country.
- Principally confined in state of M.P, it involves - 2 significant dissected pieces called -
  Vindhyans scarpland that extends upto UP inter-state boundary.
  Baghelkhand i.e extensive in Chattisgarh.

* As national water divide it is source of many extra peninsular rivers as River Chambal.

Satpuras ? → (major dissected parts) ↓ Gawilgarh (Tapi rises from here drains to Gulf of Khambat) + Mahadeo - Δ Dhupgarh → highest peak of satpura (radial) (source - Narmada) ← Maikala - Amarkantak peak → biggest eg. of centrifugal drainage

Satmalas ? → Ajanta (source of R. Penganga)
↳ Satmalas can treated separately or extension of satpura.

R. Pranhita - wardha + Penganga + wainganga

Satpuras :-

- is paleozoic block mt. that developed cenozoic lava sheets adding to its height.
- These taller block mts. (1300 mtr of avg elevation) are

technically confined b/w Narmada & Tapi rift valleys.

- As national water divide, it forms the source of peninsular river like R. Wainganga.
- Dissected by rivers Satpura involves -
  - Gawilgarh (MP - Maharashtra inter state boundary) and source of R. Tapi.
  - Mahadeo Hills (MP) with Dhupgarh - highest peak of Satpura
  - * Maikala range (MP - Chattisgarh) has Amarkantak peak with country's dominant radial drainage including R. Narmada, R. Hasdo (Mahanadi system) & R. Son (of gangetic system).

* South of Tapi rift, additional block mt. Satmalas prevails.
  It thus is extensive in state of MH.
  It is structurally similar to Satpura (limestone made block mt with cenozoic lava sheets).
  It is also dissected by the prevailing rivers with Ajanta range as significant constituent (source of R. Penganga).

Peninsular Plateau

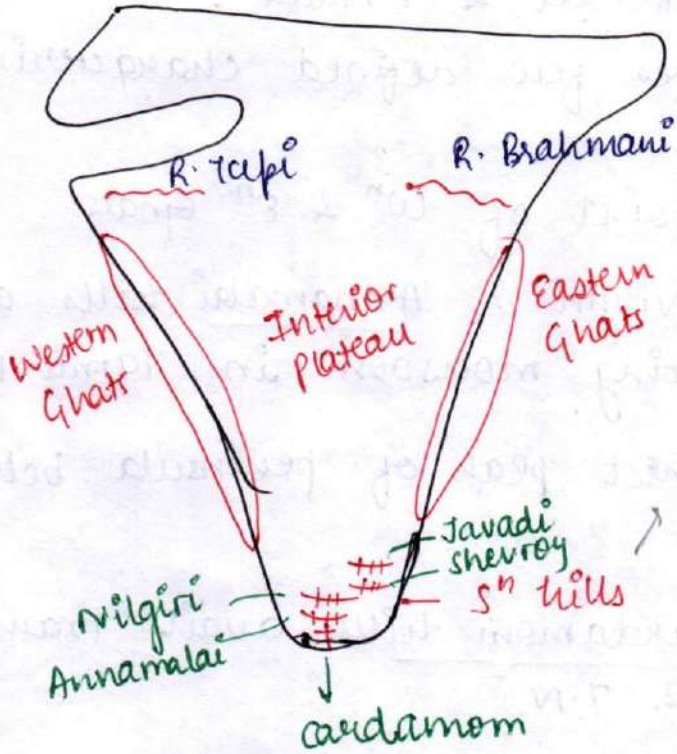
- It is the ancient most construct of the country that marked its genesis during Azoic.

- locationally it is sub categorized as -
  Deccan Plateau & other uplands

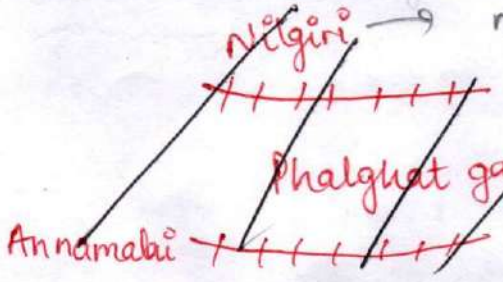
Deccan Plateau

- Located in S^n part of India . this constituent of peninsular plateau is inverted triangular shape extensive b/w R. Tapi & R. Brahmani in north & Cardamom hills in South .

- Physiographically it is comprised of -
  - S^n hills
  - Ghats
  - Interior Plateau

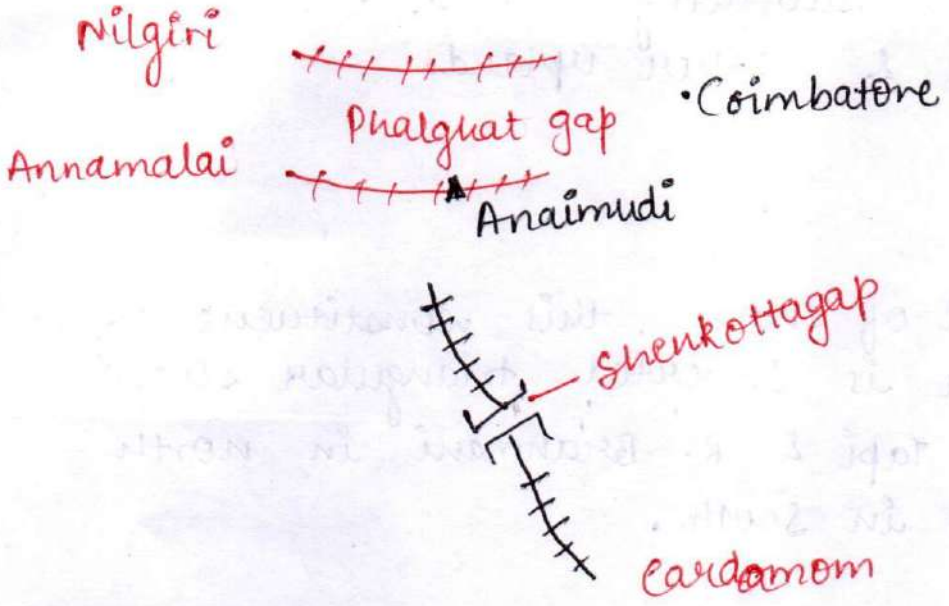


ancient plateau ← conical remains of



→ merging pt of w^n & E^n ghats

→ gateway of advancing monsoon

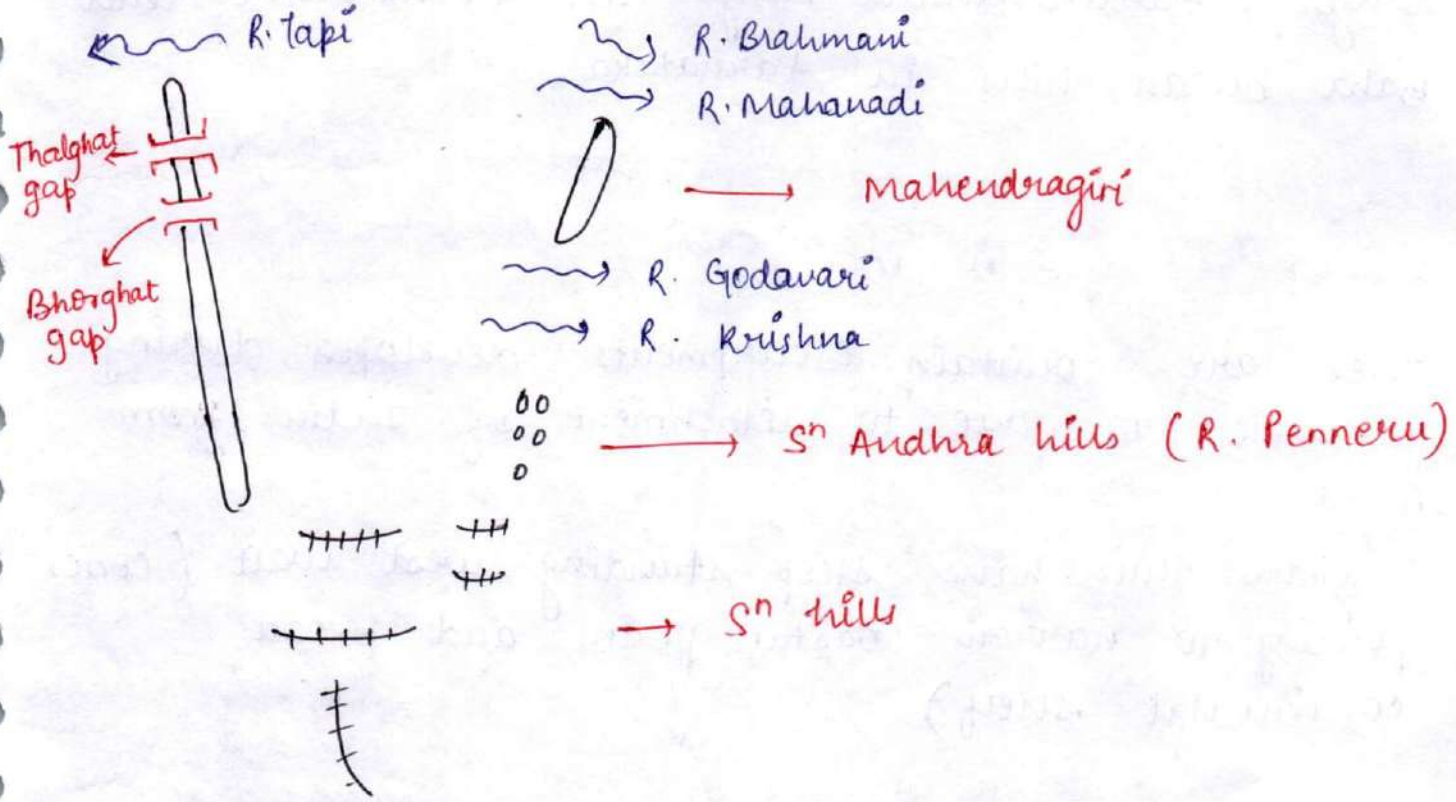


(ii) Southern hills

- Resistance thus conical remain of ancient plateau.
- Politically extensive in Kerala & T·Nadu.
- Physiographically involves few defined characteristics as -
  - Nilgiris as merger point of W^n & E^n Ghats (is in Karnataka + Kerala + T·N)
  - Palghat gap b/w Nilgiri & Annamalai hills as gateway of advancing monsoon in Tamil Nadu.
  - Annaimudi the highest peak of peninsula belongs to Annamalai hills → Kerala + T·N
  - Shenkottagap in cardamom hills, avails transportation link b/w Kerala & T·N.
  - Javadi & Shevroy hills are confined in Tamil Nadu only.

Thalghat gap - Gateway of Mumbai
Bhorghat gap - " " Konkan

ii) Ghats



- Ghats represents boundaries of deccan plateau.
- These are classified on the basis of location as Western & Eastern Ghats.
- Wn Ghats also called Sahyadris extends from R. Tapi to Nilgiris (extensive in the states of Maharashtra, Goa, Karnataka).
- Sahyadris are national water divide separating flow of east flowing big peninsular rivers as river Godavari from west flowing small rivers.
- These are largely uninterrupted barring the exception of -

  Thalghat gap i.e gateway of Mumbai

  Bhorghat gap i.e gateway of Konkan

- W^n Ghats also includes extensive ranges as Balaghat range, Harishchandra range in Maharastra and Baba budan hills in karnataka

Mt escarpment → ~~mt wall like structure~~ lump - W^n ghats
Submerged part of land → makes continental shelf

* These are mountain escarpments developed during paleozoic era due to detachment of India from Africa.
Sahyadris thus have steep standing west wall (corresponding to narrow coastal plains and broad continental shelf) → generally wider plains have wider continental shelf (CS) but W^n ghats plains submerged so broad CS.

Deccan Plateau - Physiographic unit
Deccan Trap - structural unit
↳ Malwa + Satpura + Satmala + MH Plateau + Malnad + Kathiawar

- Eastern Ghats extensive from R. Brahmani to Nilgiri forms eastern boundary of deccan plateau.

- It is highly dissected low lying constituent involving Mahendragiri (extensive b/w Mahanadi & Godavari basins) and S^n Andhra hills (dissected by R. Penneru network).

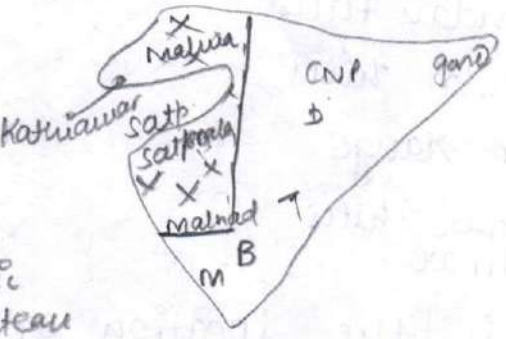
iii) Interior Plateau

- Bounded within ghats & S^n hills. interior plateau is also ancient block of the country.

- It principally includes -
  - Maharastra Plateau

- Karnataka Plateau
- Telangana Plateau
- Dandkaranya Plateau

* Some of these constituents have endured structural modifications in Cenozoic (lava plateau) as Deccan trap including -
  - Maharashtra Plateau &
  - Malnads of Karnataka



☒ - Cenozoic lava plateau

Other uplands :-

- These constituents of Indian peninsular plateau are collectively ancient construct including -
  - Malwa Plateau
  - Kathiawar Upland
  - Chotanagpur Plateau
  - Far E^{n} Upland

- Malwa Plateau of MP makes significant location of trap country.

It involves Bundelkhand plateau as its structural extension.

Physiographically it is known to have excessive riverine erosion (by the rivers rising from Vindhyans) as R. Chambal. → undulating land.

* It also involves Ravines (Badlands) as its physiographic feature

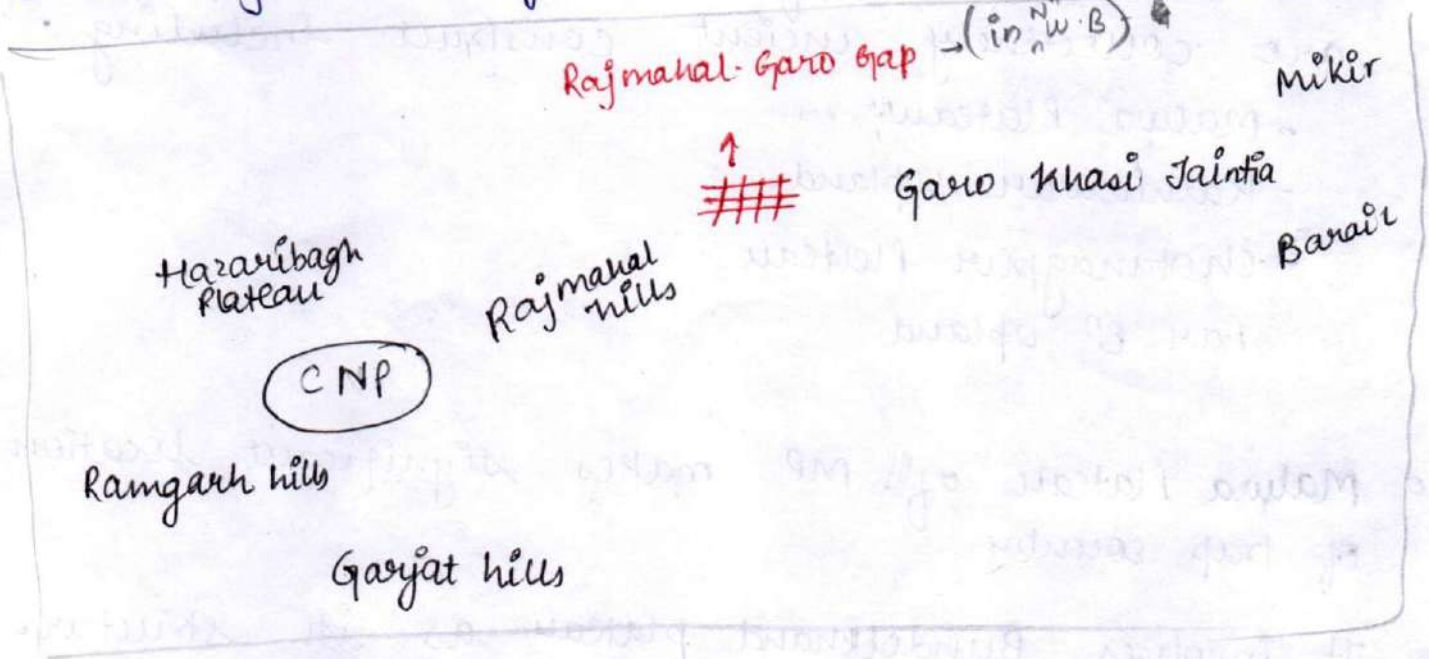
- Kathiawar ~~Plateau~~ upland -

Physiographically detach unit of peninsular plateau, Kathiawar upland is also the eg. of ancient plateau with Cenozoic trap country.

This upland of S^n Gujarat is comprised of -

- Mandav Hills
- Barda hills
- Gir range
- ~~Girnar~~ hills
  Girnar

This is the location of radial drainage involving R. Shetrunji, R. Bhogava and R. Bhader



- Chota Nagpur Plateau -

is big block of ancient plateau in E^n part of India involving conical remains as Garjat hills (Odisha), Rajmahal hills (West Bengal) and Ramgarh hills (Chattisgarh).

It includes Rajmahal - Garo gap, also called Malda Gap i.e the dissected part of Indian

ancient plateau filled up with river deposits (as of R. Tista).

Beyond this gap far eastern upland forms the structural continuation of Chota nagpur plateau.

It is largely conical remains of ancient plateau that includes -

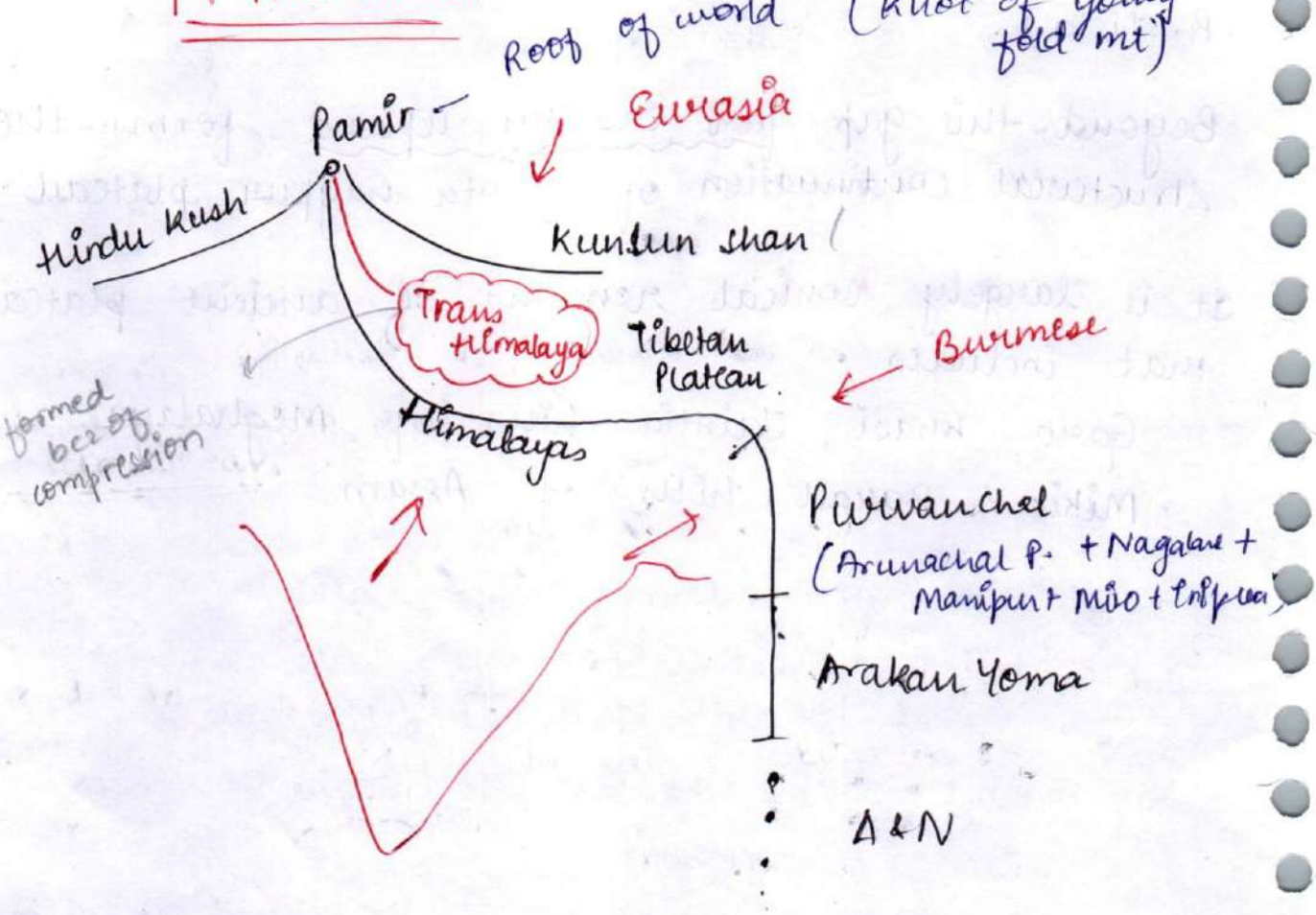
Garo, Khasi, Jaintia hills of Meghalaya
Mikir & Barail hills of Assam

Paleozoic - Aravalli + Vindhyan + Satpura + Satmala + W^n ghats
Cenozoic - Malwa + Satpura + Satmala + Kathiawar + MH + Malnad

Trap country → formed by magma solidification
- Jaha Jaha lava hai (magma)

Magma
- Felsic
- Mafic
  - Basaltic
    - ↓
    - travel more distance

Mountains



- In the entire northern part of the country, there is the prevalance of tallest young fold mountains of world (developed in Cenozoic time).

- The compressional stress that facilitated its formation involved Indian convergence with Eurasia as well as Burma (Burmese plate).

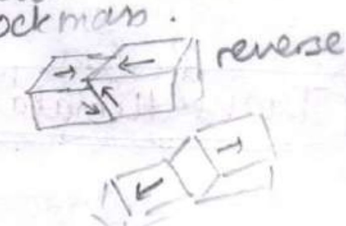
- It is therefore that the N^n mountain wall is ~~chara~~ categorised into 3 principle categories -
  - Trans Himalayas
  - Himalayas → Himadri, Himachal, Shiwalik - overturned
  - Purvanchal

(Indian plate) ← South se compressional or north se resistance isliye southern side steeper & N^n slope gentle (Eurasian)

Himachal - Duars [foot of Mt]
Shiwalik - Bhabar

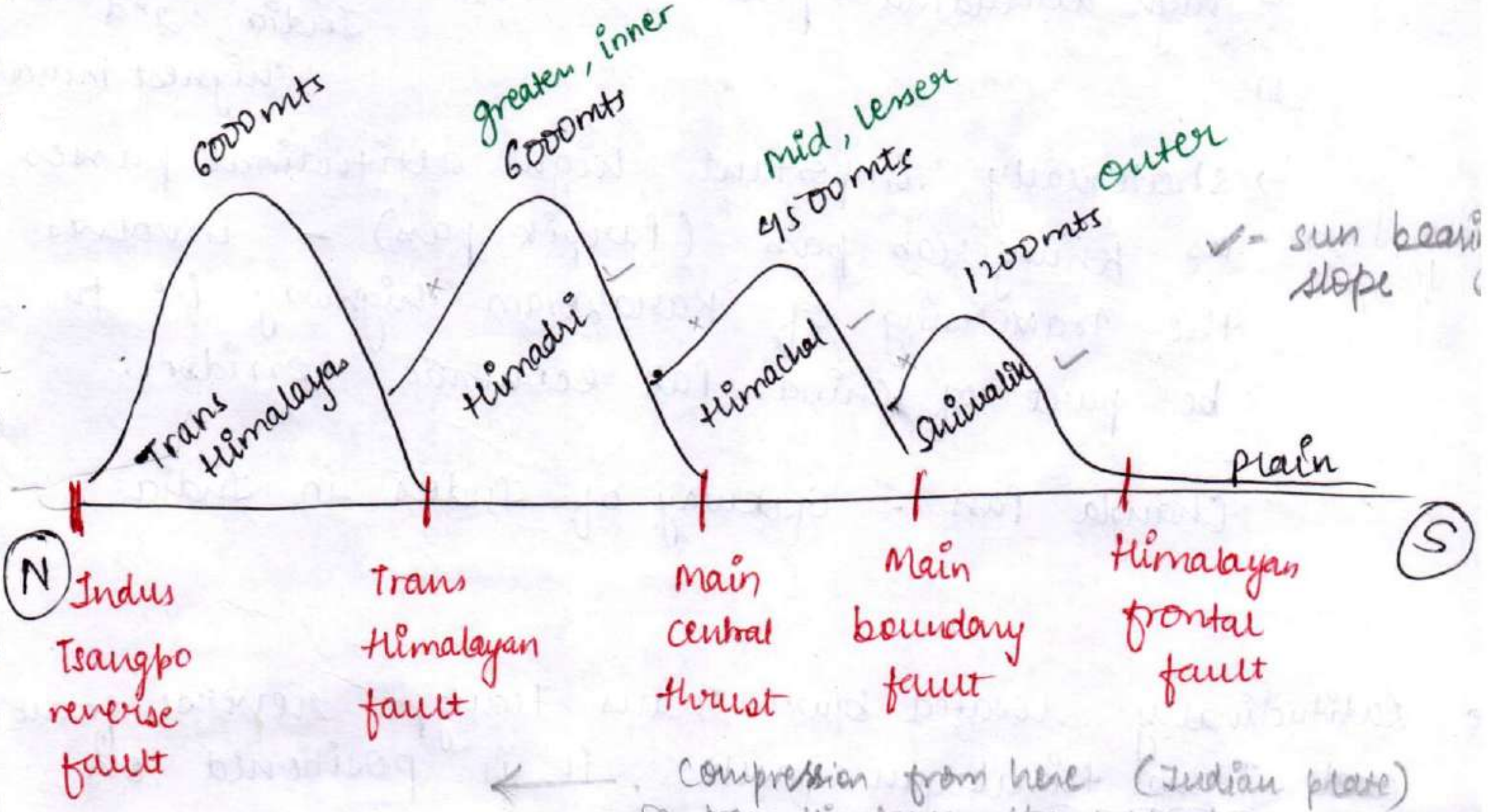
Himachal overturned → S^n strong compress. force but N^n less resistance bcz ↙

Pulling apart → normally leads to faulting (fold)
Compression → normally results in Anticline but sometimes
crust ← reverse faulting bcz of brittle rock mass.



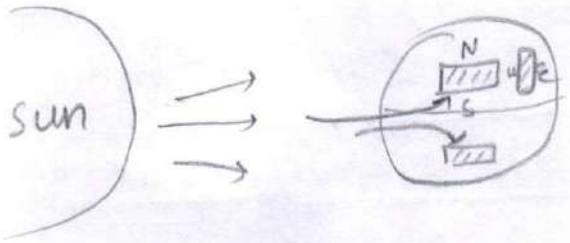
N^n we go → oldest
↳ Trans Himalaya
S^n → comparitively younger
↳ Shiwalik.

why Himachal called lesser himalayas ? —
↳ Himachal & Himadri got folded together so himadri ko strong resistance mila but Himachal ke N^n form ho rha tha so not so strong jise overturned fold bna so less height than Himadri
Hence its boundary with Shiwalik called main boundary fault



← Compression from here (Indian plate)
so Trans Himalayas sbse pehle bne then Himadri + Himachal & then Shiwalik
↓
Hence Shiwalik comes in zone V of Earthquake prone zone

Reverse faults + (Major ranges)
Cordilleras



in NH, S^n is sun rays bearing slope
SH N^n " " "

Himadri block sun bearing characteristics of Trans Himalayas.

Trans Himalayas

- The oldest young fold mountain of the country.
- confined in UT of Ladakh
- is asymmetrical fold with avg. elevation of 6000mts.
- relating to its height, it involves -
  - ↳ high altitudinal peaks as K_2 (highest peak of India, 2nd highest in world)
  - ↳ strategically important high altitudinal passes as Khunjerab pass (POK) (Parpik pass (Indian name)) - involves the traversing of Karakoram highway i.e to be part of China Pak economic corridor.

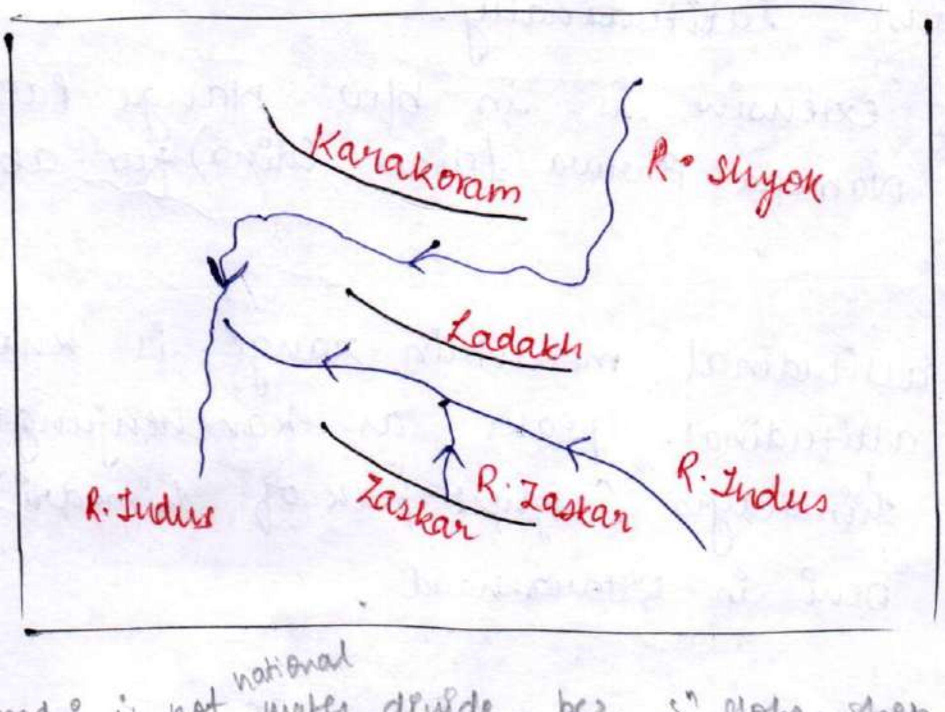
    Changla Pass - Gateway of Indus in India

- Latitudinally located b/w Indus Tsangpo reverse fault and Trans Himalayan fault, it is positioned on the lee side of himadri thus lacks in sun bearing slopes resulting in -
  - Lengthy mountain glaciers with more than 50km

of winter snout length.
Siachin Glacier - Nubra Valley
Hispar, Batura valley in Hunza valley
Biafo, Baltoro - Srinagar Valley

- Barren water logged high altitudinal plains as
Aksai Chin
Rupshu → Tso Morari ← as (Tethys sea ka scooped up part hai ↓ (hollow elevated) lake in gyr)
Soda Plain + Lingi tang Plains — with brackish water lake

* Originally developed as one range, trans Himalaya presently depicts 3 parallel running ranges called
- Karakoram
- Ladakh
- Zaskar
as these are separated by deep valleys of river Indus and its tributaries as R. Shyok and R. Zaskar



Karakoram all import/major glaciers & highest peak

→ Himadri is not national water divide bcz S^n slope steep & only from here river drain & also N^n slope in China, S^n in India

→ Snowline is line where temp remains 0°
Himalayas ka snowline ... mts ... se glaciers

like beyond the milege so glacier are found in trans Trans himalayas.

Himalayan cordilleras

- Major constituent of N^n mountain wall.
- Latidunally extensive b/w trans himalayan fault to himalayan frontal fault
- Political extensive is from J&K to Arunachal Pradesh (uptill river Dihang).
- These cordilleras include 3 defined parallel running ranges -

a) Himadri

- is greater himalayas or inner himalayas.
- have avg. elevation of 6000 mts
- extensive b/w trans himalayan fault & main central thrust latitudinally.
- Longitudinal extensive is in b/w Nanga Parbat (J&K) to Namcha Barwa (Tibet, China) for about 2400 km.
- This high altitudinal mountain range is known for high altitudinal peaks as Kanchenjunga in Sikkim himalayas (highest peak of himadri) and Nanda Devi in Uttarakhand.
  ↳ world heritage convention site
- It involves lengthy mountain glaciers with winter snout length of upto 20 kms. as