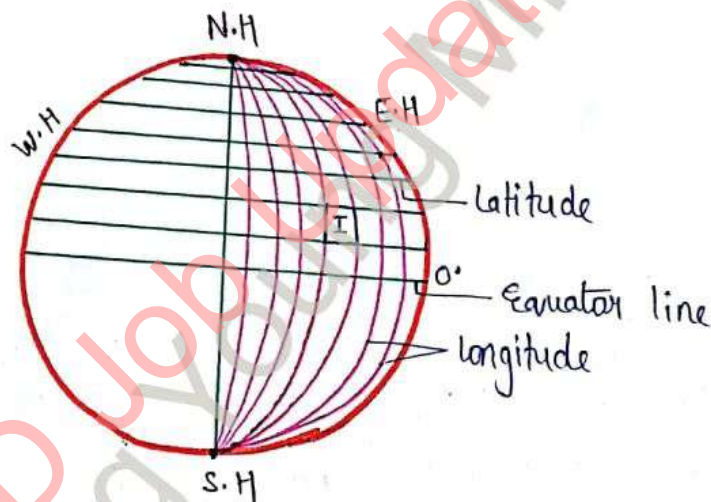


# Geography

Indian  
(3Q)

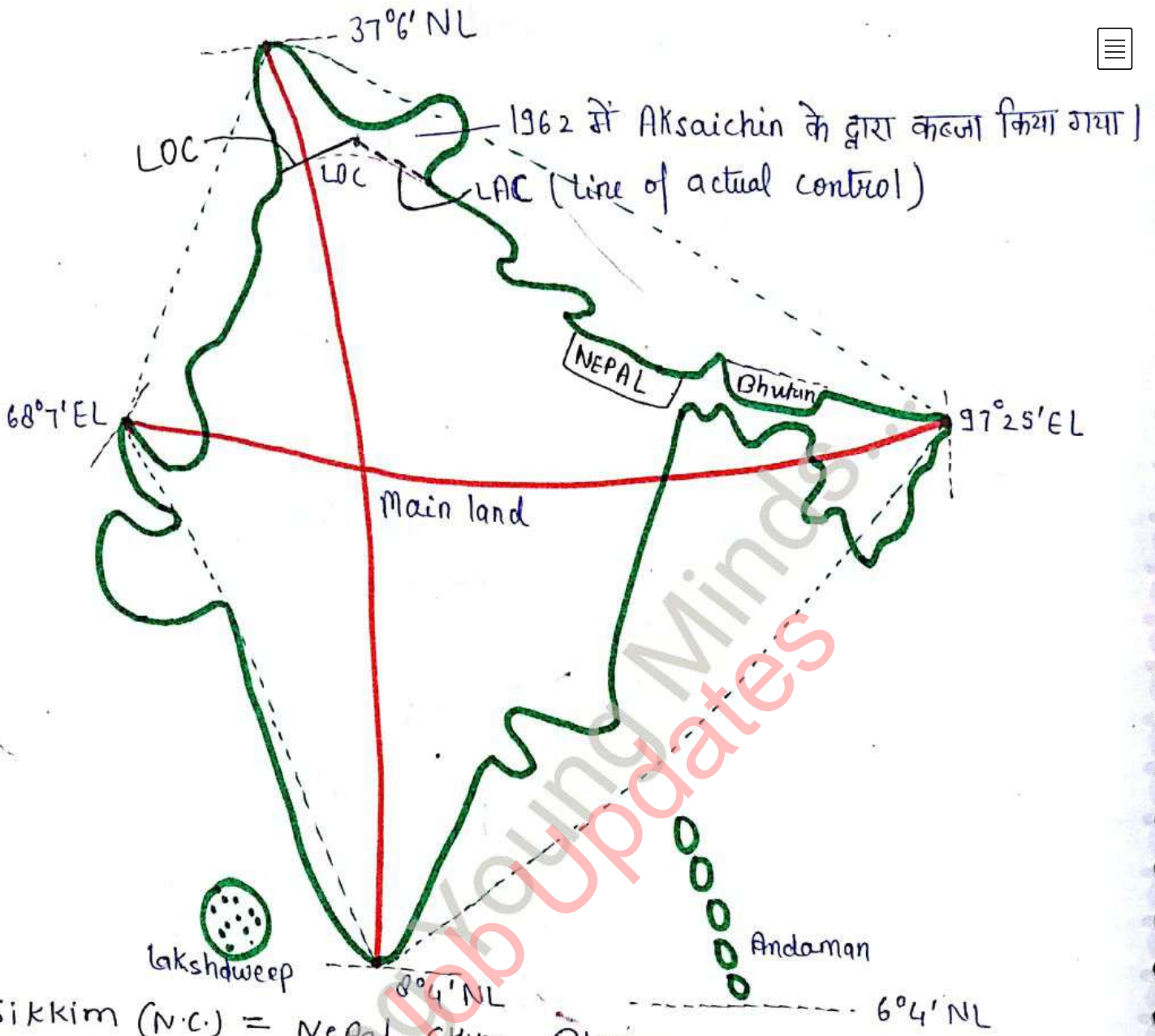
World  
(1Q)

## INDIAN GEOGRAPHY



### Location :-

- Location of India - North-East hemisphere
- In between lls of two latitude line India is situated at  
-  $6^{\circ}4' \text{NL}$  to  $37^{\circ}6' \text{NL}$  (NL = North latitude)
- Main land of India -  $8^{\circ}4' \text{NL}$  to  $37^{\circ}6' \text{NL}$
- In between two longitude line India is situated at  
-  $68^{\circ}7' \text{EL}$  to  $97^{\circ}25' \text{EL}$  (EL = East longitude)



Sikkim (N.C.) = Nepal, China, Bhutan

- Bengal की सीमा रेखा (Neighbouring countries) = 3  
Nepal, Bhutan, Bangladesh

- Assamachal Pradesh (Neighbouring countries) = 3  
Bhutan, Myanmar, China

- Assam (N.C) = 2 Bhutan and Bangladesh

- Bihar (N.C) = 1 Nepal

- Uttarakhand (N.C) = 2 China and Nepal

- Jharkhand (N.C) = 1 Bangladesh

Mizoram (N.C) = 2 Myanmar and Bangladesh

Jammu & Kashmir = 3, Pakistan, Afghanistan, China

→ North point of India - **Indira col** (situated at POK - Pakistan occupied Kashmir)

• Undisputed north point of India - **Siachin Glacier**

**Siachin Glacier**

- Situated at J and K In Karakoram range
- Largest Glacier of India (72 km)
- Nubra river originates from Siachin Glacier
- Highest battle field of the world.
- Battle b/w India and Pak (1984)

**Operation Meghdoot** Operate by Indian Government

→ South point of India - **Indira point** (situated at Great Nicobar) (In 1977)

• Other name of Indira point is **Pigmalion point** and **Parseen point**.

→ South point of mainland of India - Kanyakumari (situated at Tamil nadu)

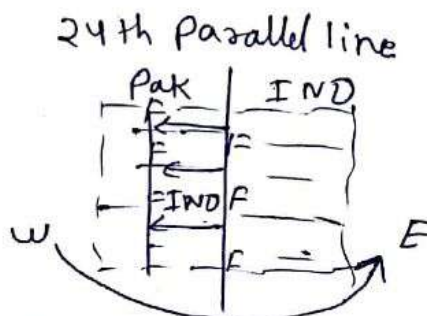
or  
Cape cambrin  
(अन्तरीय)

{ Cape: land area which is surrounded by water from three sides. It is long and narrow.

Kanyakumari is famous for both sunrise and sunset.

→ East point of India - **Walangu** (situated at Arunachal Pradesh)  
or  
Kibithu

Sir creek  
Dispute  
blw India & Pak



Creek / क्रीक  
Soil Creeping  
भूरा लपटा  
Solifluction  
Process

→ West point of India - Rajpur creek (situated at Gujarat)  
 or  
 Guhar moti

Range of India → North - South = 3214 km  
 → East - West = 2933 km

Shape of India - Quadrilateral

Land frontier :-

भारत की सीमा रेखा → 7 देश, 17 राज्य

भारत के पड़ोसी देश → 9 देश, 7 स्वतंत्र + 2 अर्धीय

Clue	Name	Km.	Border line
BA	Bangladesh	4096 Km	Zero line with Tripura
↓ CH	China		McMohan line with Arunachal Pradesh (1914)
Dec. PA.	Pakistan		Red cliff line → J&K, Punjab, Raj., Gujarat (1947)
N	Nepal		→ Natural Boundary
M	Myanmar		
B	Bhutan		
A	Afghanistan	106 Km or 80 Km	Durand line in 1896 with J&K (POK)

Clue → BA CH PA N se M B A

→ Grayner is a Britisher who defines the state.

→ 13 Dec. 1946 Ko Nehru ne Preamble ko Represent Kiya.

→ Sovereignty (समप्रभुता) → बाहरी देशों का Interfere नहीं करना और खुद की Policy बनाना।

→ राज्य की परिभाषा में शामिल → Defined area  
→ Population  
→ Governance  
→ Sovereignty

→ Am 21<sup>st</sup> Ammendment act se ~~8~~ language include kiye h. → 1967

7<sup>th</sup> " " " 3 - Konkani, <sup>(Maharashtra)</sup> Marathi, <sup>Manipur</sup> Nepali → 1992

9<sup>th</sup> " " " 4 - Bodo, Dogari, <sup>(Bihar)</sup> Santhali, Maithali → 2003

→ Great Barrier Reef - Australia

→ पृथ्वी का 3<sup>rd</sup> pole = Siachin Glacier

→ Capital of USA = Washington DC → District of Columbia

→ नगर निगम की शुरुआत = 1687 - Madras → By French



- \* { De jure Head → By law → President  
 { De facto head → Applied basis → Prime minister

Total land area of India:-

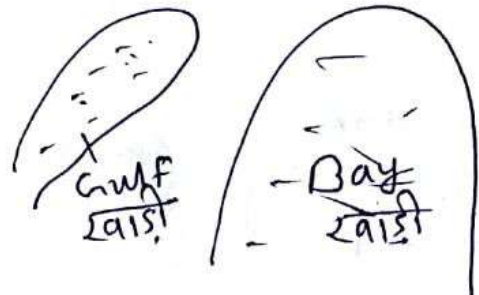
- 32, 87, 263 sq. Km.
- or 32, 87, 240 sq. Km (By 2015)
- 2.4 % of the world.
- 7<sup>th</sup> Ranked in the world.

Population :-

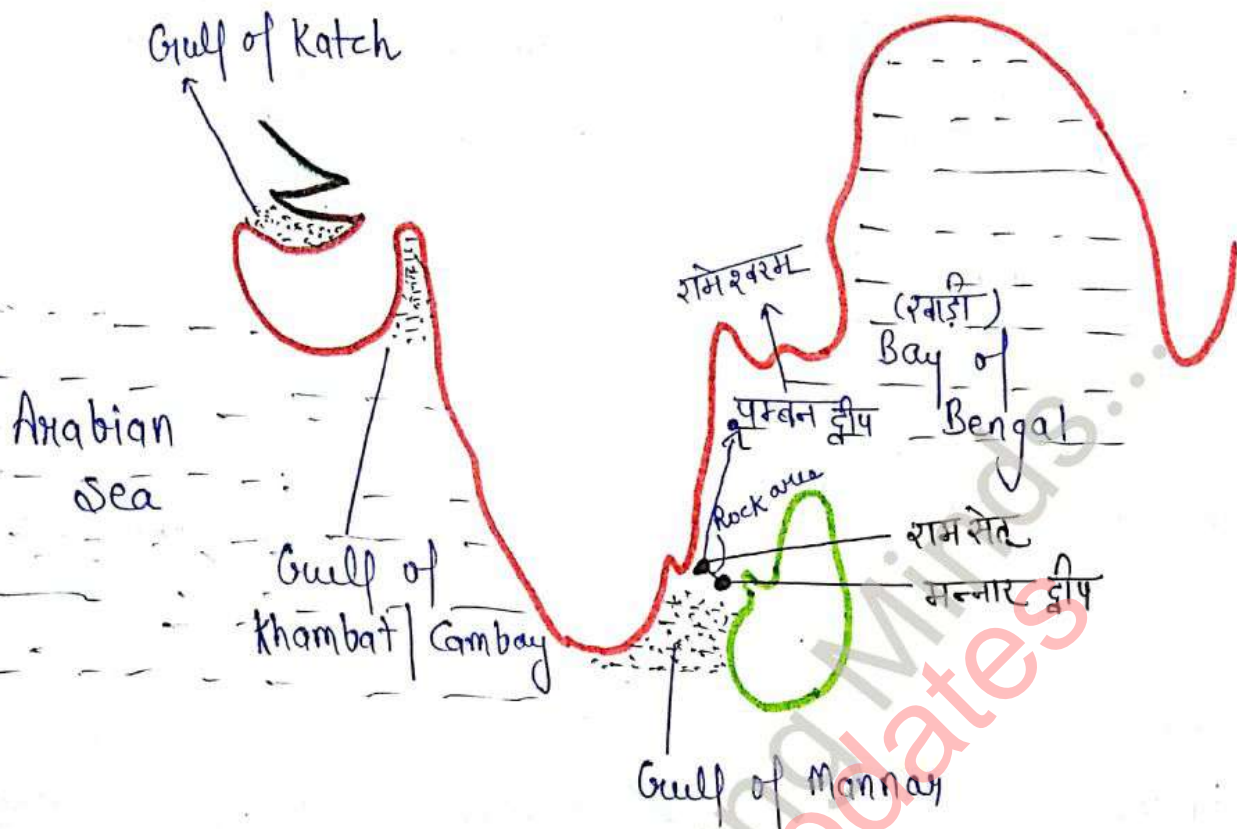
- 121 crore by 15<sup>th</sup> census 2011
- World census is first time used - Lord Mayo in 1872. First census (जनगणना)
- Regular census - Lord Rippon in 1881.
- 17.6 % of the world.
- 2<sup>nd</sup> Rank in the world.
- I<sup>st</sup> → China
- III<sup>rd</sup> → USA

खाड़ी → जो ~~दो~~ <sup>दो</sup> तरफ राज्यों (land) से घिरी हुई हो। चौड़ी Area.

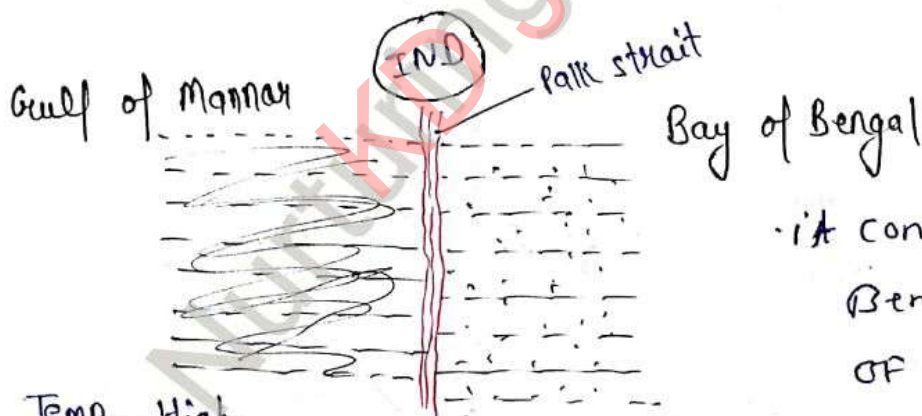
Gulf → Narrow area.



Nepeyidaw → Capital of Myanmar



- Pamban island is situated in gulf of Mannar.
- Rameshwaram is situated on the Pamban island.
- Palk Strait (जलसंधि) → भारत और श्रीलंका Palk Strait से अलग हैं।



• it connects Bay of Bengal to Gulf of Mannar

Temp. - High  
 Precipitation - High  
 Rain → ↑  
 Salinity → low  
 Density → low

Density high

\* Strait is formed due to different density of water.

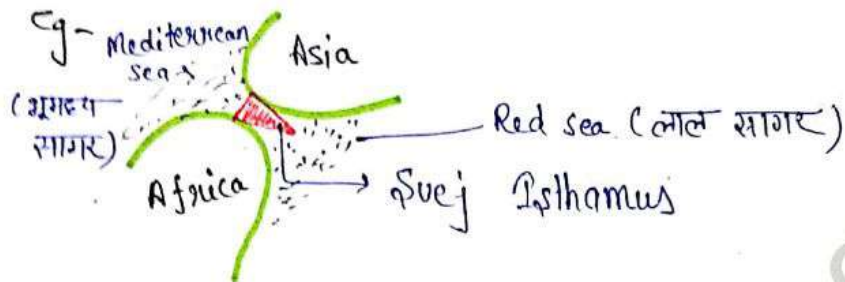
- Palk strait connects Bay of Bengal to Gulf of Mannar and separates Bharat to Sri Lanka.

- Pamban channel separates Bharat to Sri Lanka.

**Channel** → लंबा सकरा जलीय ग्राह → It is a long narrow water body which separates two land area.

- Isthmus (शुवलसंधि) :-

It connects two land area and separates two water body.



Coastal line :-

**Total** - 7516.6 Km.

**Mainland** - 6100 Km.

**State** - Gujarat (Max<sup>m</sup>)  
Andhra Pradesh  
Tamil Nadu

**India** - including island - 1. Andaman & Nicobar - 1900 Km.  
2. Gujarat → Approx. 1600 Km.

- Andaman & Nicobar island पर population नहीं है तो इसे coastal line में include नहीं करते हैं।

Definition of state



1. Gujarat coast -

Gujarat + Daman & Diu

**Kathiawad coast** - In state - Gujarat

2. Konkan coast -

Maharashtra + Goa  
↳ **Range** - Daman to Roha

3. Kannad Coast -

Karnataka  
↳ **Range** - Roha to Mangalore

4. Malabar coast -

Kerala

5. Coromandal coast -

Tamil Nadu

<sup>Incl.</sup> 6. North Sarkar -

Andhra Pradesh

7. Utkal coast -

Odisha

8. Bengal coast :- Bengal



State	- 9
U.T	↳ Daman & Diu
	↳ Puducheri
	↳ Andaman & Nicobar
	↳ Lakshadweep

← Have coastal area

In mainland  $\rightarrow$  9 state + 2 U.T = 11 coastal area

In India  $\rightarrow$  9 state + 4 U.T = 13 " "

Puducherry की सीमा रेखा - 1. Yanam - Andhra Pradesh

3 state and 4 place

2. Puducherry } Tamil Nadu

3. Karaikal

4. Mahe - Kerala

## Islands :-

Total = 247 islands

Arabian sea

43 islands

Bay of Bengal

204 islands

Lakshadweep

Andaman & Nicobar

→ Total island - 36

→ It is an example of  
Coral island.

↓  
'Rain forest of ocean'

- Coral is most biodiversity area which is made of  $\text{CaCO}_3$  and Polyp animal and its food - BGA.

Coral -  $5^\circ \text{N'S}$  to  $23\frac{1}{2}^\circ \text{N'S}$

Temp. =  $25^\circ \text{C} - 27^\circ \text{C}$

Coral -

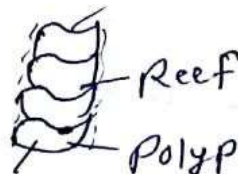
Food - Blue-Green Algae

Salinity - Avg. 35%

Coral are not found where Rivers merges into an ocean.

Corals are called

'Rain Forest of ocean'



Reef

Polyp Animal

$\text{CaCO}_3$  Great Barrier Reef

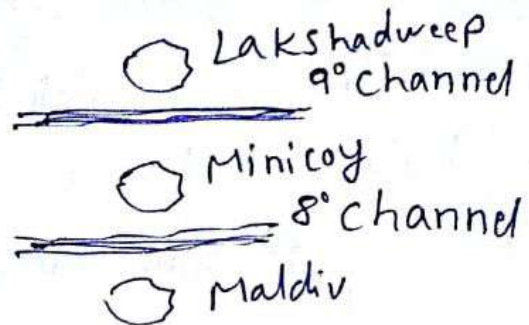
Australia

## Lakshadweep-

- Capital - Kavaratti
- Largest island - Minicoy

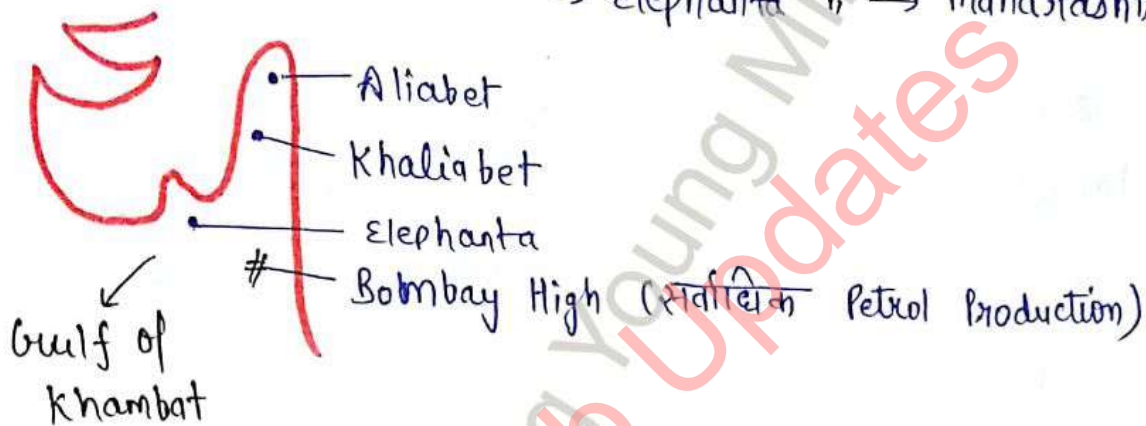
9° channel separates - Minicoy to Lakshadweep

8° channel separates - Maldiv to Minicoy



In Gulf of Khambat → 3 Island

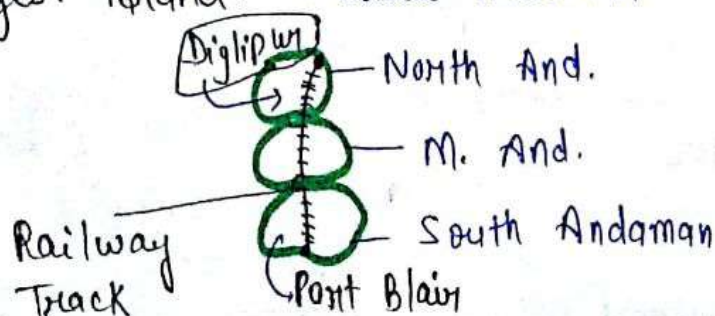
- ↳ Aliabet island } Gujarat
- ↳ Khaliabet " } Gujarat
- ↳ Elephanta " → Maharashtra



## Andaman and Nicobar:-

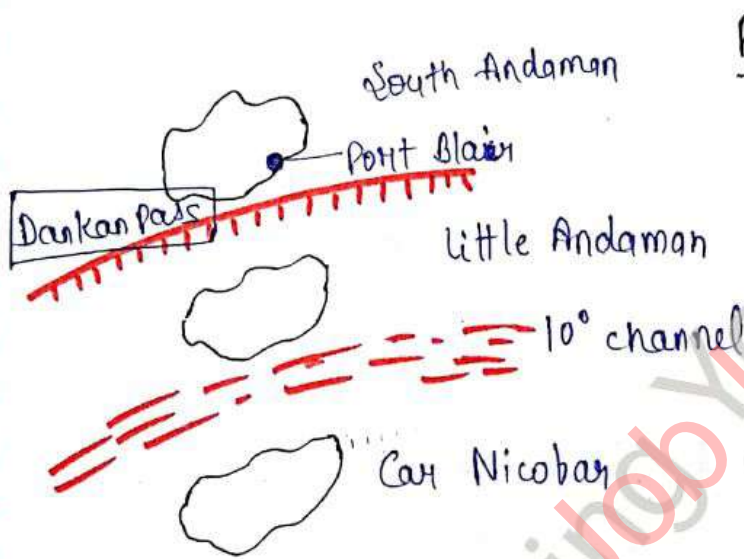
- It is an example of volcanic islands.
  - It is an extended part of **Arakanyoma mountain, Myanmar.**
- Capital - Port Blair (13<sup>th</sup> largest Port (बन्दरगाह)), South Andaman of India

<sup>2016</sup> largest island - Middle Andaman



- Only active volcano of India = **Barru island** in middle andaman it is situated.
- Highest peak of Andaman and Nicobar - **Saddle Peak** (700m approx)  
In **north Andaman island**.
- Highest peak of Nicobar - **Mount. Dhuliyan** (500m approx)  
In **great nicobar island**.

10° channel separates Little Andaman to Car Nicobar.

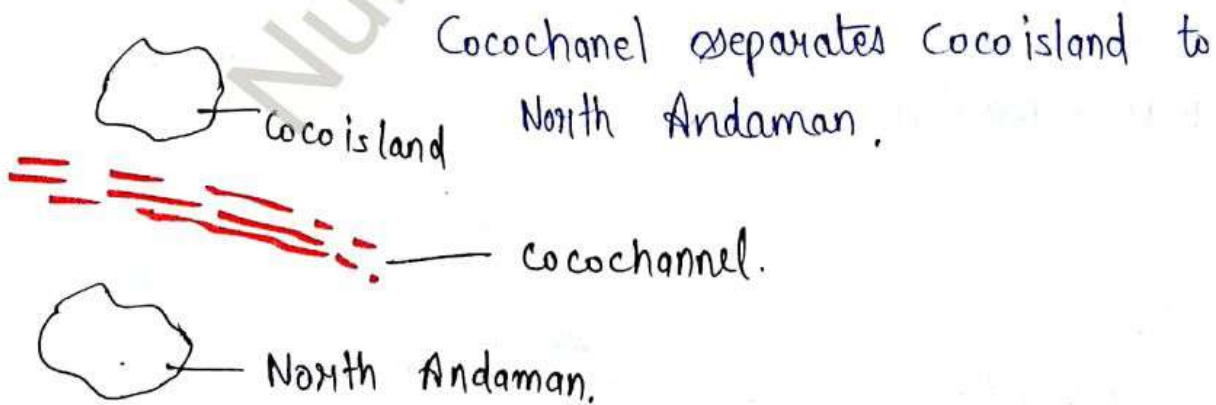


Pass :- Way to connect two places.

Dankan pass :-

Dankan pass is in between south Andaman and little andaman.

Coco channel :- Coco island पहले India में था और अब Myanmar में है।



Coco channel separates Coco island to North Andaman.

⇒ Tropic of Cancer passes through how many states — 8 states

1. Gujarat
  2. Rajasthan
  3. MP
  4. Chattisgarh
  5. Jharkhand → Capital = Raanchi (Direct pass tropic of cancer)
  6. Bengal
  7. Tripura
  8. Mizoram
- Tropic of cancer is a last line in which sun rays falls perpendicularly. No shadow occurs in this line.

IST line (Indian standard Time line) :-

1. Naini, Allahabad (UP)

$$82 \frac{1}{2}^{\circ} E L$$

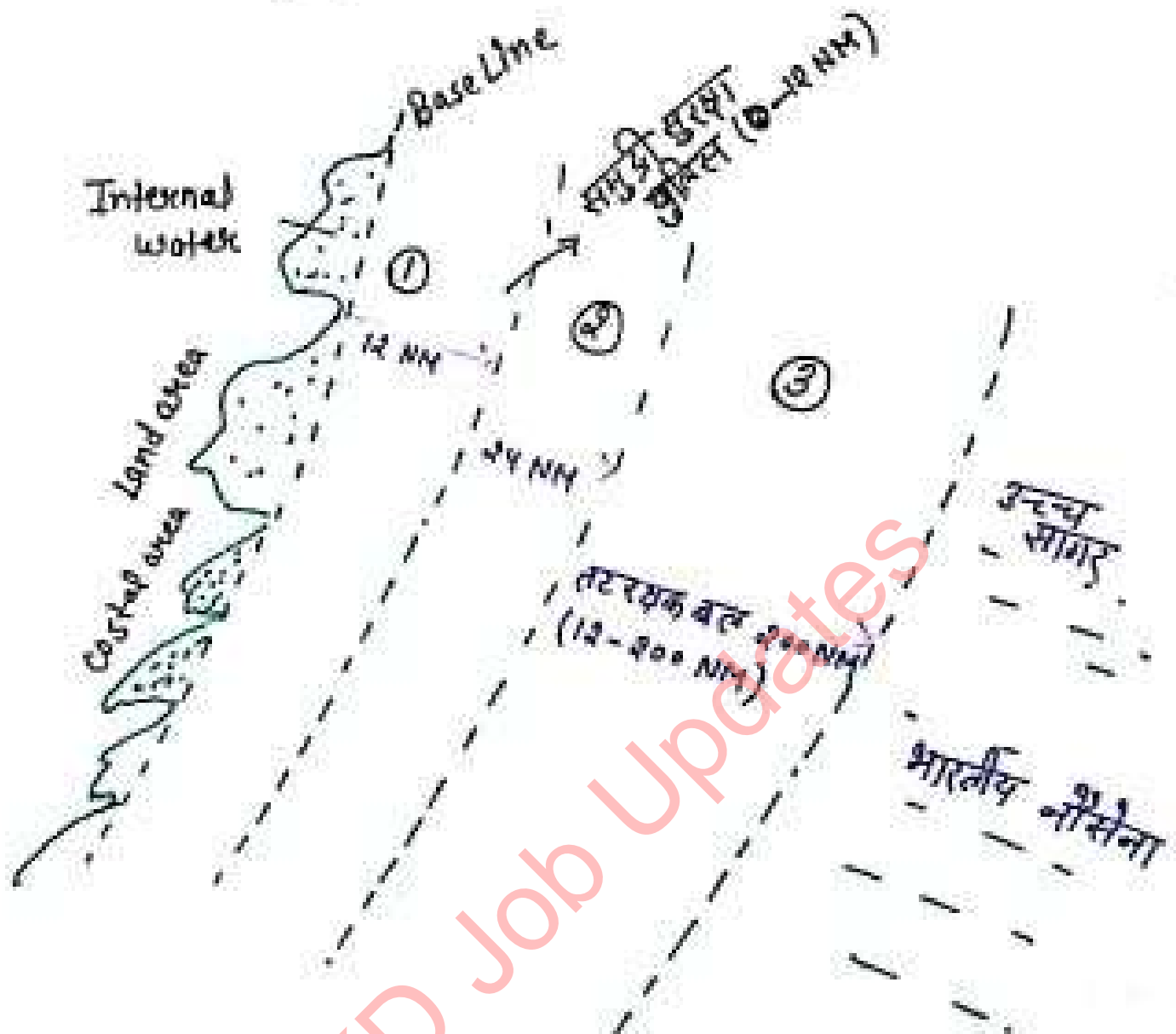
2. MP

3. Chattisgarh

4. Odisha

5. Andhra Pradesh

# Sea Border of India



- समुद्र में दूरी = नौटीकल मील
- 1 Nautical Mile = 1852 m

## (1) Territorial Sea :-

# 12 Nautical Mile

- Sovereign Area, whole Rights reserved to coastal Nation.
- Without permission can't enters into this part.

## (2) Contiguous Zone :-

- # 24 Nautical Mile
- State can continue to enforce laws in four specific areas ; Customs, taxation, immigration and pollution (cleaning)
- it is a hot pursuit area.

## (3) Exclusive Economic Zone (E.E.Z) :-

- # 200 Nautical Mile
- Right to utilisation of natural resources  
eg- Fisheries, Petroleum etc.
- Right to form New Island, Scientific Research
- Foreign nations have the freedom of navigation and overflight, subject to the regulation of the coastal states, can also lay submarine pipes and cables.

# United Nations Convention on the Law of the Sea (UNCLOS), 1982. It defines the rights and responsibilities of nations with respect to their use of the world's oceans, establishing guidelines for businesses, the environment, and the management of marine natural resources.

# Physiography of India :-

1. Himalaya
2. Peninsular India
3. Great Northern Plains including Thar Desert
4. Island
5. Coastal area

## 1. Himalaya :-

- Young folded mountain.
- Formed in - Tertiary era
- Length - 2400 km.
- Shape - Arc shape
- Himalaya is situated between Indus river & Brahmaputra river.

⇒ Primary structure of earth (जब पृथ्वी बनीं तब -

1. 1. Continent = Pangea (super continent)

2. 1. Ocean = Panthalasa

### Division of Pangea (In Carboniferous era)

#### Angara land

1. Eurasian plate
2. North America plate

#### Gondwana land

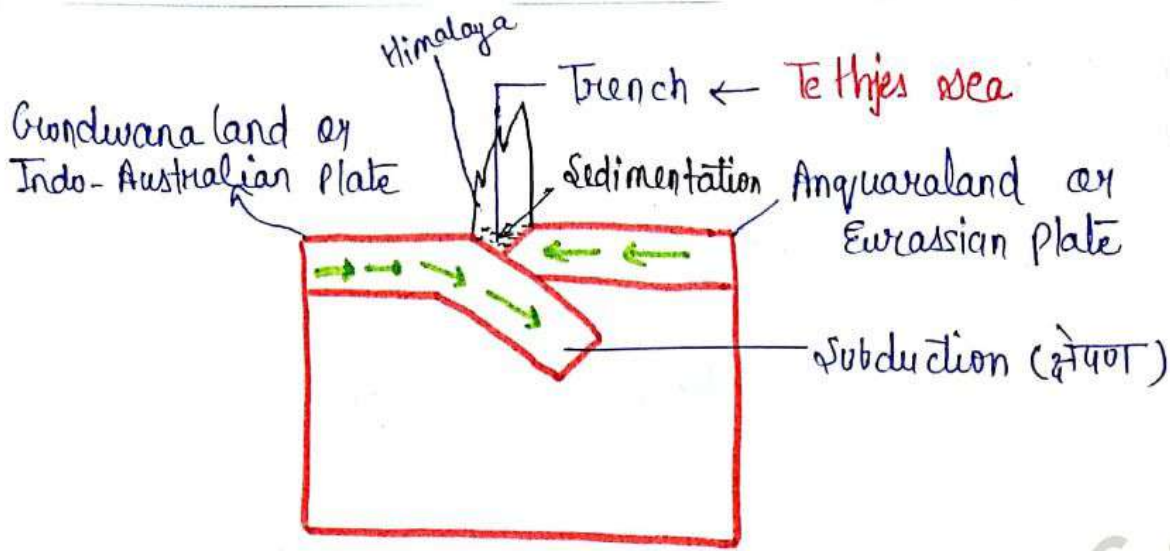
1. South America plate
2. African plate
3. Indo-Australian plate
4. Antarctica plate

Total seven plates.

(7.) → Pacific ocean plate (largest plate on earth)

Residual part Panthalasa का अवशेष है।





Convergent plate Margin

Note - No volcano occur in Himalaya because less depth of subduction of plate

⇒ जब Sediment आकर इकट्ठा होगा तो sedimentation fill होगा और Temp. के effect के कारन तीन Range ka Himalaya बनेगा।

- A volcanoes are absent in Himalaya because of less depth of subduction of plate.

Geosyncline (भूसन्नीत) - Found b/w two plates. It is a long-narrow, deep water body. It is an

Tethys sea is an example of geosyncline.

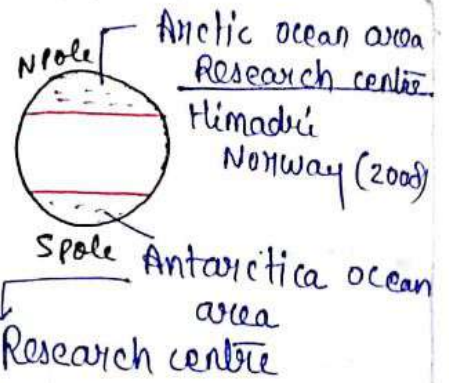


- 3 Ranges of Himalaya - 1. Greater Himalaya (Inner Himalaya)  
 ↓  
 Formed in Tertiary era
2. Lesser Himalaya (Middle Himalaya)
  3. Shivalik (Outer Himalaya)

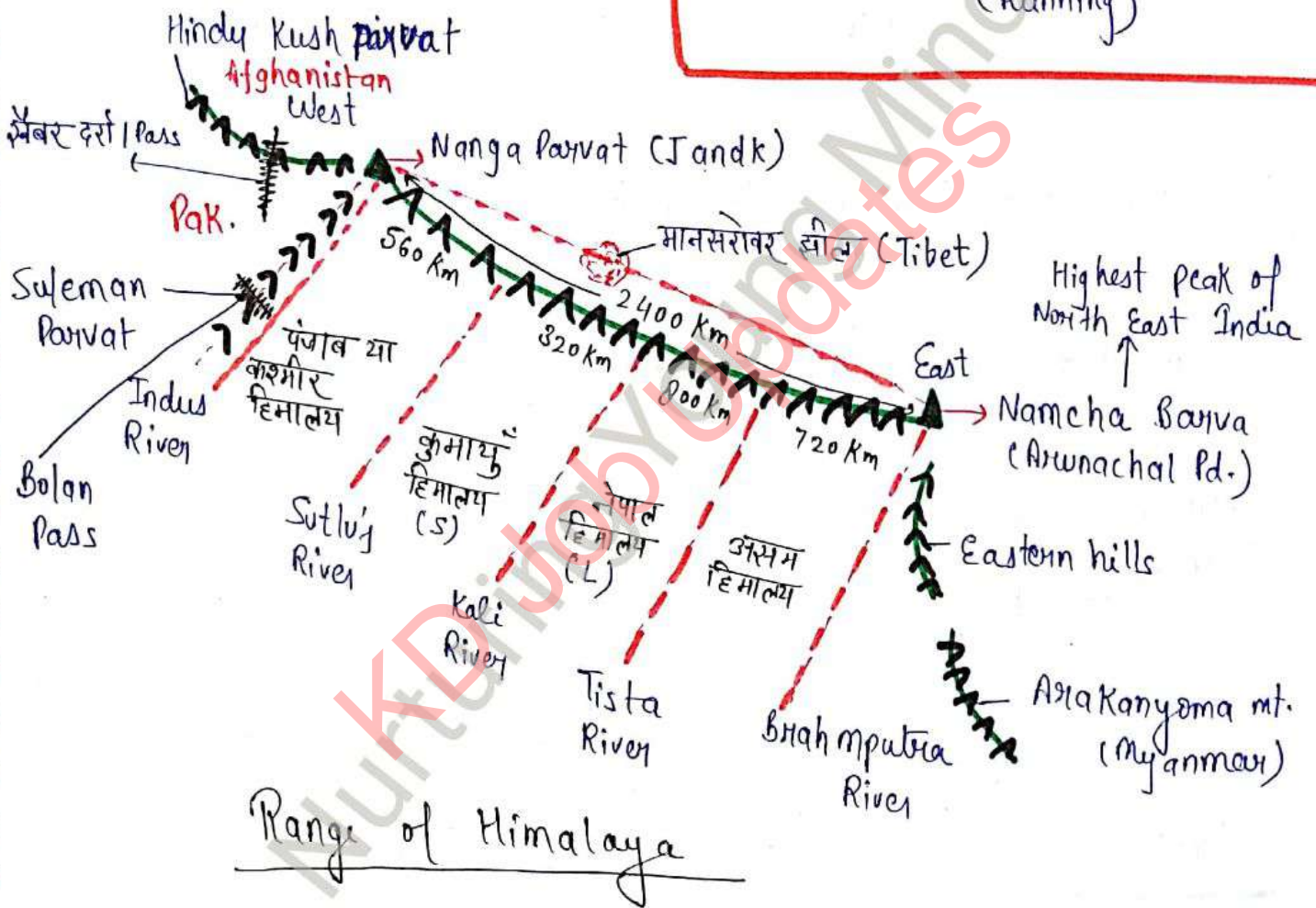
# Greater Himalaya -

- It is called 'Himadri'.
- Formed in Eocene era.
- A metamorphic rocks are found in greater Himalaya.
- Himalaya in b/w Sindhu & Brahmaputra River

Note-



- Khetan ho chuki h
1. South gangotri - 1983
  2. Maitri - 1990
  3. Bharti - 2012 (Running)

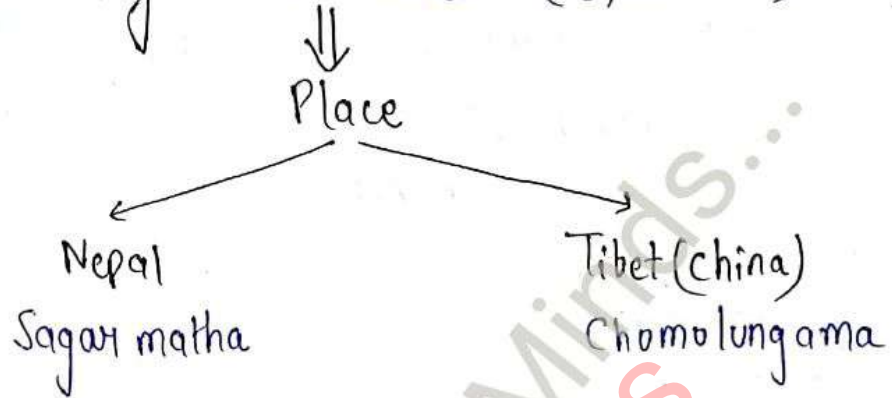


## Range of Himalaya

Largest Himalaya = Nepal Himalaya  
 Smallest Himalaya = कुमायुँ Himalaya

- Hindu Kush Parvat in b/w Pak. and Afghanistan
- Khairbar pass → The way from Pak to Afghanistan.
- Bolan pass → The way from Pak. to Baluchistan.

→ Highest peak of Himalaya = Mt. Everest (8,850 m)



→ Highest peak of Himalaya in India = Kanchanjunga (8,598 m)  
(Sikkim)

→ Undisputed highest peak of India = Nanda Devi (7816 m)  
(Uttarakhand)

Highest peak of Himalaya	Rank	Peak Name
	1.	Mount Everest
	2.	K <sub>2</sub>
	3.	Kanchanjunga
	4.	Lhotso
	5.	Makalu

Glacier :- सालों भर बर्फ का क्षेत्र होना

- |              |   |             |
|--------------|---|-------------|
| 1. Gangotri  | } | Uttarakhand |
| 2. Yamunotri |   |             |
| 3. Milam     |   |             |
| 4. Zemu      | - | Sikkim      |



4. Zemu - Sikkim

2. Lesser Himalaya (Middle Himalaya) :- Sedimentary rock

- It is called Himalachal.
- Formed in - Miocene era

Ranges :- 1. Peer Panjal → J and K

2. Dhauladhar → Himachal Pd.

3. Nagtibba → Uttarakhand

4. Mahabharat → Nepal

5. Patkoi Bum → Arunachal Pd. (N → S)

North  
↓  
South

- Vaishno Devi Mandir ⇒ Trikut choti in Peer Panjal



Murg :- It is a small grassland which found on the slopes of Lesser Himalaya in J and K. It is called **wugyal** in Uttarakhand.

3. Shivalik :-

# valley of Kashmir

- Outer Himalaya. is situated b/w Greater Himalaya & Peer Panjal Range
- Southern Himalaya.
- Formed in Pliocene era.

Doon ⇒ Western side of Shivalik.

Dwar ⇒ Eastern side of Shivalik.

# valley of Kathmandu

is situated b/w Greater Himalaya & Mahabharat Range

# # Trans Himalaya:-

- It is not a part of Himalaya. it is an outer part of Himalaya

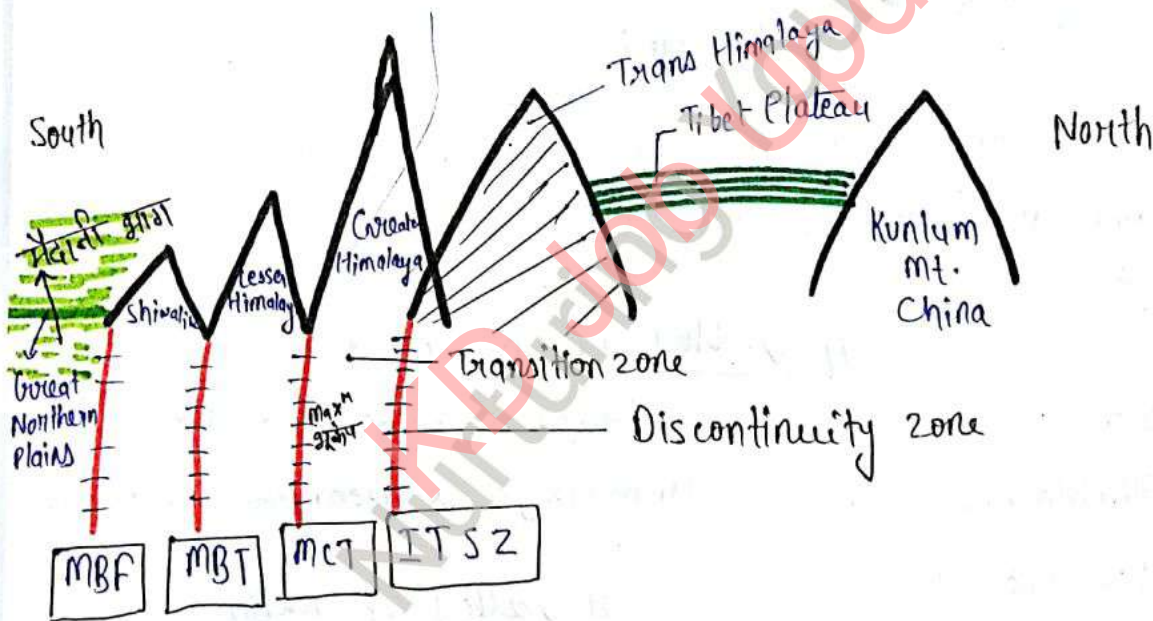
Ranges:- 1. Karakoram → J and K → Highest peak of India - K<sub>2</sub>  
 Highest peak - K<sub>2</sub> on Godwin Austin (8,611m)  
 ↓  
 POK

→ Siachin Glacier

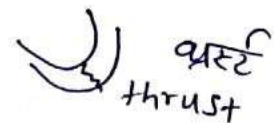
2. Ladakh Range → J and K  
 Highest peak - Rakaposhi

3. Zaskar Range → J and K

4. Kailash Range → Tibet (China)

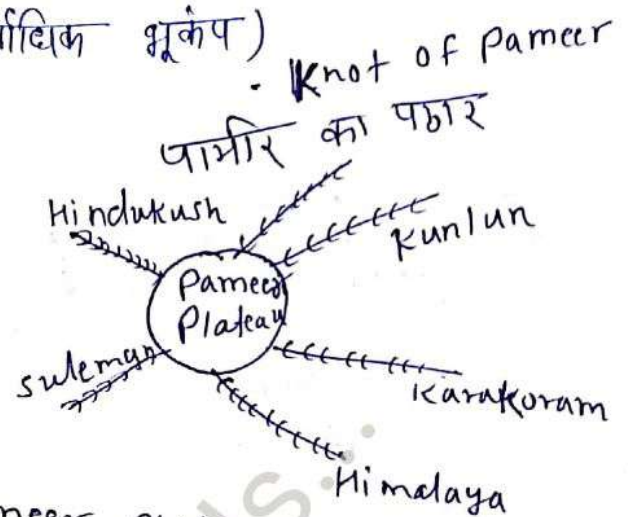


- जब चढ़ाने मुड़ कर हट जाती हैं Rocks की density के कारण तो उसे Thrust कहते हैं यहीं भूकंप आते हैं।



Note - Cordillera → it is a high land where several Mountain Ranges connected with each other.  
 कोडिलेरा

- ITSZ = Indo-Tsangpo suture zone
- MCT = Main central Thrust (सर्वाधिक भूकंप)
- MBT = Main Boundary Thrust
- MBF = Main Boundary Fault



## 2. Peninsular India :-

### A. Aravali Mountain :-

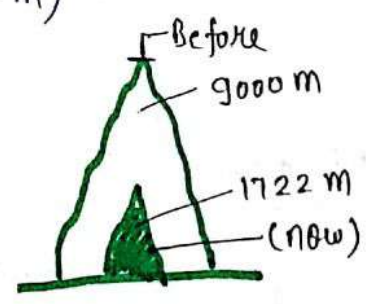
- Oldest folded mountain.
  - Formed in - Precambrian era
  - It is an example of Relict or Residual mountain.
- Pamir Plateau is an example of Cordillera

Range :- विस्तार

Palampur to Moinu Tilla  
(Gujarat) (Delhi)

State → Gujarat, Rajasthan, Haryana, Delhi.

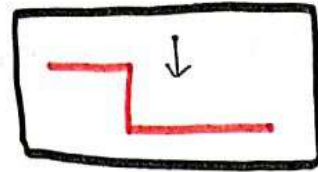
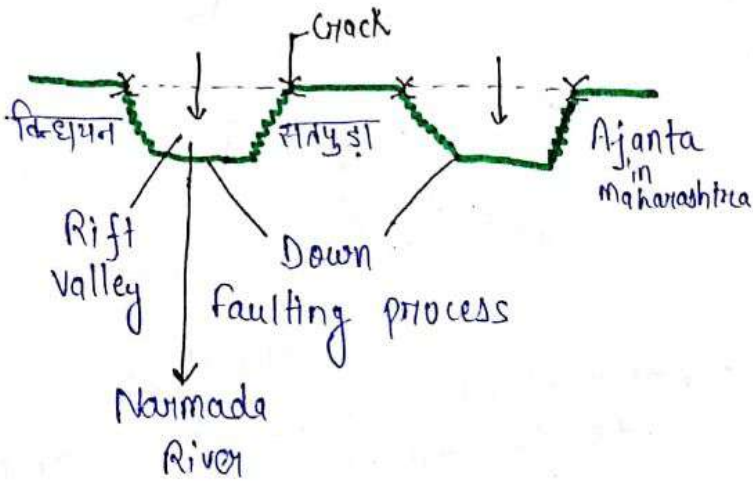
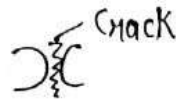
Highest peak = Gurusikhay (1722 m)  
(Rajasthan)



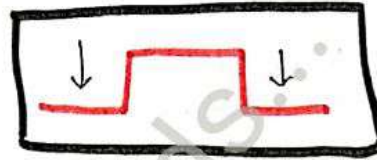
### B. Vindhyan Mountain :-

- It is an example of Escarpment Mt. / Block Mt. (कगार पर्वत)
- Residual mountain.

दो ब्लॉक के बीच में दरार



Escarpment



Block mountain

ब्लॉक पर्वत or अक्शेद्यक पर्वत or भ्रंशोत्थ पर्वत

Extension of Vindhyan MT.

Bharney Hills Gujarat to Bundelkhand UP & MP to Baghelkhand UP & MP to Kaimur Hills Bihar

- Vindhyan mountain divides India into North India to South India.

C. Satpura Hills :-

- It is an example of Block mountain.

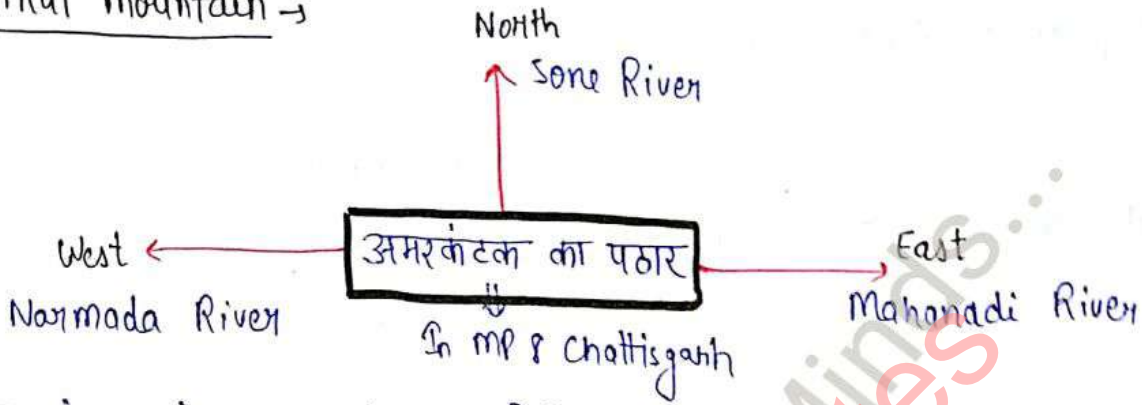
Extensions :-

Rajpipla Hills Gujarat to Gwaligarh Hill (MP) to Mahadev Hills M.P. to Maikal MT. MP and Chattisgarh

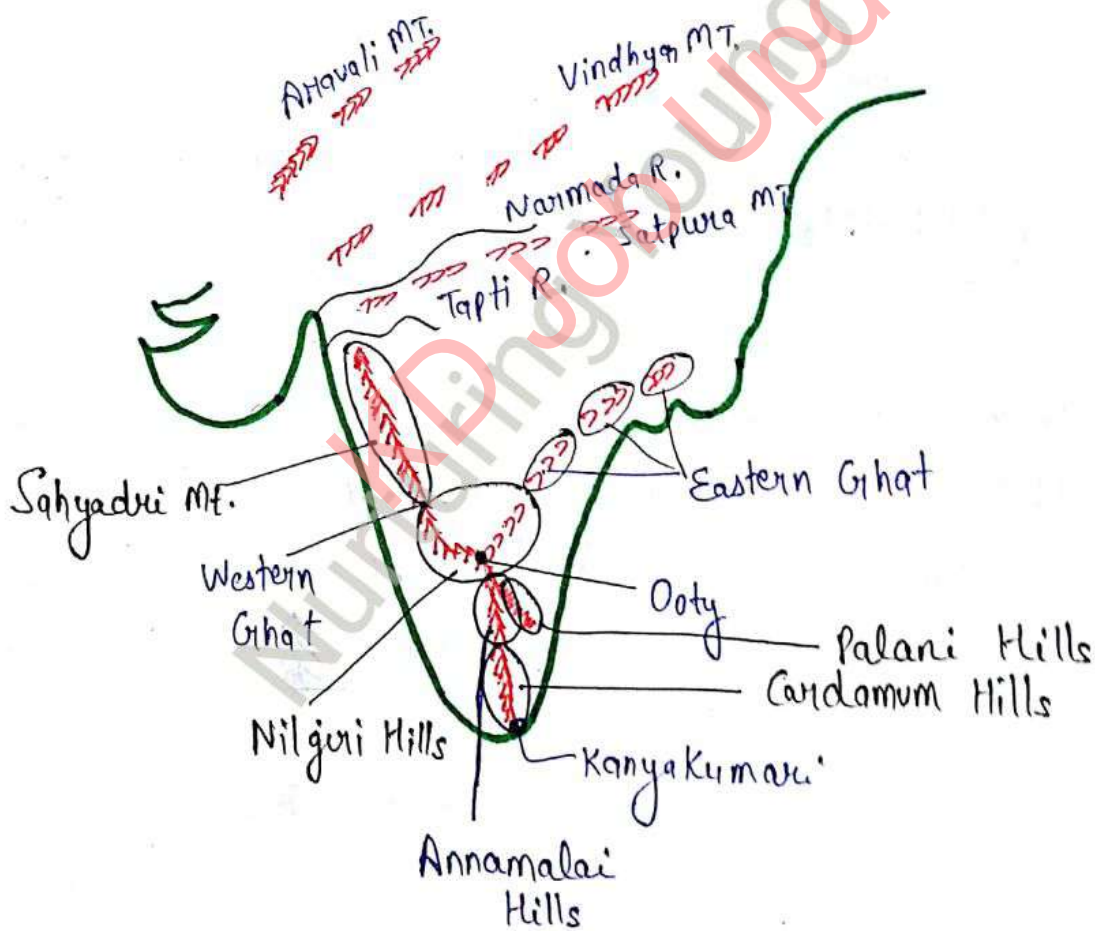
Highest peak of Satpura Hills = Dhoopgarh (1350m)  
in Mahadev Hills

- Panchmarhi is tourist place in Mahadev Hills (Dhoopgarh) → Mr

Maikal mountain →



- अमरकंटक के पठार से 3 नदियों का Origin होता है।





## D. Western Ghats :-

- It is an example of Escarpment MT.

## सह्याद्री MT. :-

- North part of Western Ghats is called as सह्याद्री पर्वत.

Highest peak of सह्याद्री MT. = Kalsubai (1646 m)



In Maharashtra

- सह्याद्री पर्वत 4 राज्यों में होगा =
  1. Gujarat
  2. Maharashtra
  3. Goa
  4. Karnataka

## Nilgiri Hills :-

- Situated on Tamil Nadu.
- It is a connecting place of Western Ghats and Eastern Ghats.

Highest peak of Nilgiri Hills = Dodabeta (2637 m)



In Tamil Nadu

- It is called as blue mountain.
- It is an example of block mountain.
- Toda tribes is found on the Nilgiri Hills.
- Sholas Forest is found on the Nilgiri Hills.



## Annamalai Hills :-

- Situated on Tamil Nadu and Kerala
- Highest peak of Annamalai Hills = Anaimudi / Anamudi (2695 m)  
↓  
In Kerala
- Anaimudi is also known as Elephant mountain.  
Anamudi

[ Highest peak of South India / Western Ghats = Anaimudi / Anamudi ]

- Sholas forest is found on Annamalai Hills.

## Cardamum Hills :-

Most of the part are situated on Kerala but some on Tamil Nadu.  
Shenkottah pass = way to connect Tamil Nadu to Kerala.

## Palani Hills :-

- Situated in the east of Annamalai Hills.
- Palani Hills = Tamil Nadu.
- 'Kadai Kanai' is a tourist place situated on Palani Hills.

## Eastern Ghats :-

- It is found in several blocks because rivers has cut down their hills.

Highest peak of Eastern hills = 1. Mahendragiri (1501 m)

↓  
In Odisha

2. Vishakhapatnam Peak  
in Andhra Pradesh

In Tamil Nadu :- 3 Hills -

1. Javadi
2. Shevroy
3. Aquasthamalai

In Andhra Pradesh :- 5 Hills -

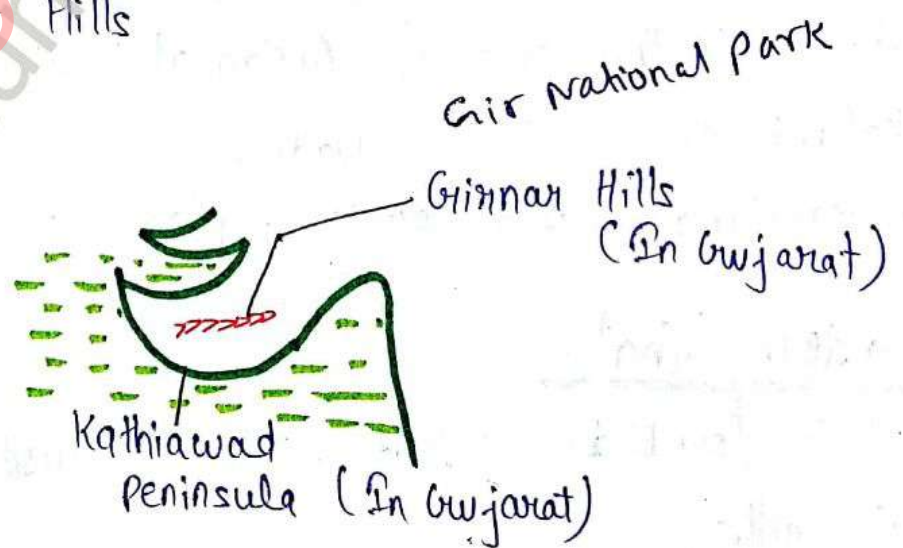
1. Nallamalai
2. Palkonda
3. Vellkonda
4. Sri Shelam
5. Tirumola Hills

In Karnataka :- 2 Hills -

1. Melagiri → Chandan के वृक्ष पाये जाते हैं।
2. Bababudan Hills = Irons are found

In Odisha :- 1 Hills -

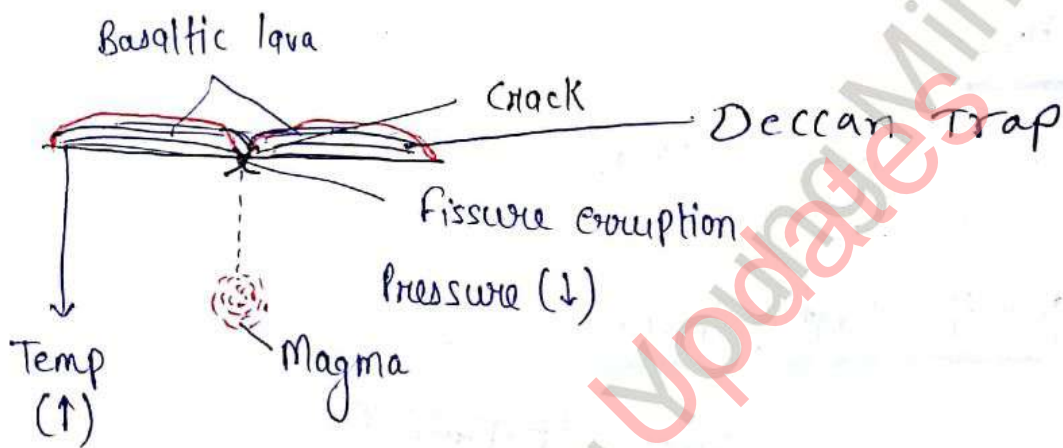
Garhjat Hills



## Deccan Plateau :-

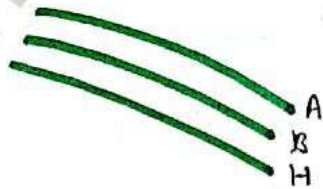
Area:- Gujarat  
Maharashtra  
MP  
Karnataka

- It was formed by deposition of **Basaltic lava** through
- fissure eruption in Cretaceous era.



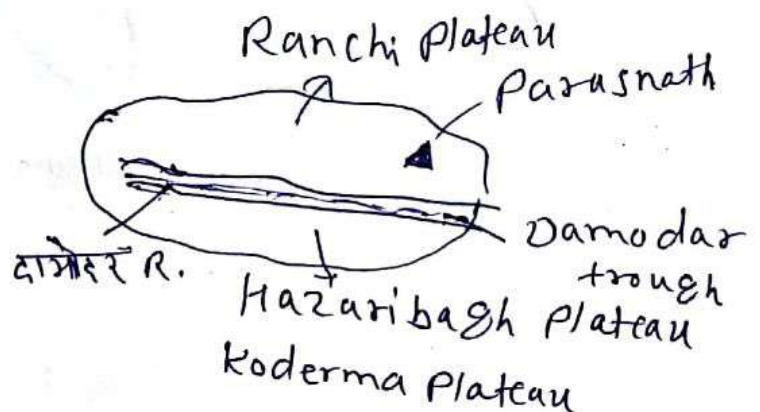
## Finger type Hills :- In Maharashtra

1. Ajanta Hills
2. Balaghat Hills
3. Harishchandra Hills



## Chhotanagpur Plateau :-

- Situated on Tharkand.
- Nagpur = Zeromile city.  
↓  
Famous for orange.



Highest peak of Chotanagpur plateau = Parasnath Hills (1370m)  
↓  
In Coeedy

- It is called 'Ruhr of India'.

Ruhr = Famous for coal in Germany

### Dalma Hills:-

- Situated in Jharkhand.
- Only place of India where proof of volcanic activity has found.

### Rajmahal Hills:-

- Its in a Bengal and Jharkhand.

### Hills of North East India:-



## Assamachal Pd. Hills -

1. Miti
2. Abom
3. Mishmi
4. Dafla

## Assom Hills :-

1. Miki
2. Rengama
3. Barail

## Nagaland Hills :-

1. Naga Hills.

Highest peak of Naga Hills - Saramati (3682 m)

↓  
Highest peak of Eastern Hills

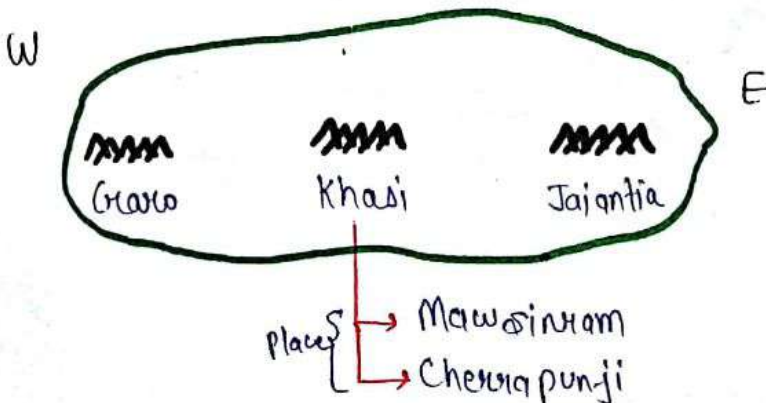
## Mizoram Hills :-

1. Blue Hills
2. Lushai Hills

## Tripura Hills :-

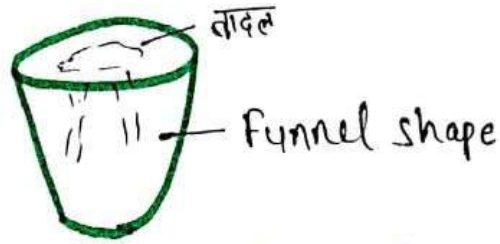
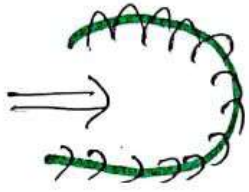
1. Lushai Hills

## Meghalaya Hills :-



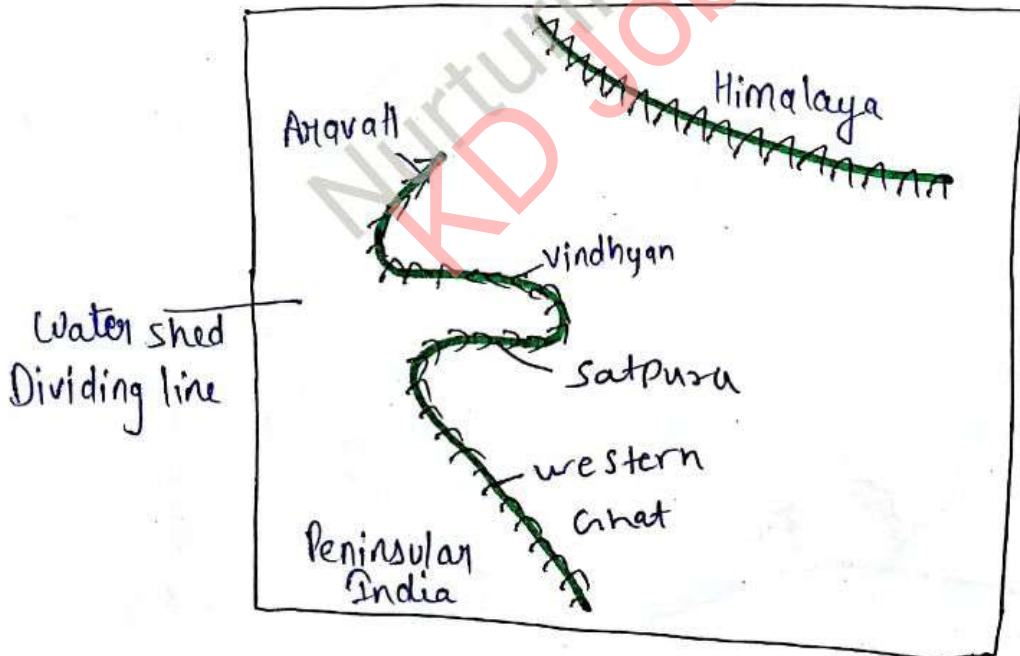
Highest peak of Meghalaya Plateau :- Nokrek

Khasi की पहाड़ी 3 side से घिरी होती है।



- Max<sup>m</sup> Rainfall of the world = Khasi की पहाड़ी . Mawsinram  
(1100 cm) or Chera Punji
- Garo Khasi Jaintia Hills is a part of peninsular plateau of India or Deccan plateau.
- Rajmahal-garo gap or Malda gap = In Bengal

### River System of India :-



# West flowing River :-

→ Towards Arabian sea.

## 1. Indus River :-

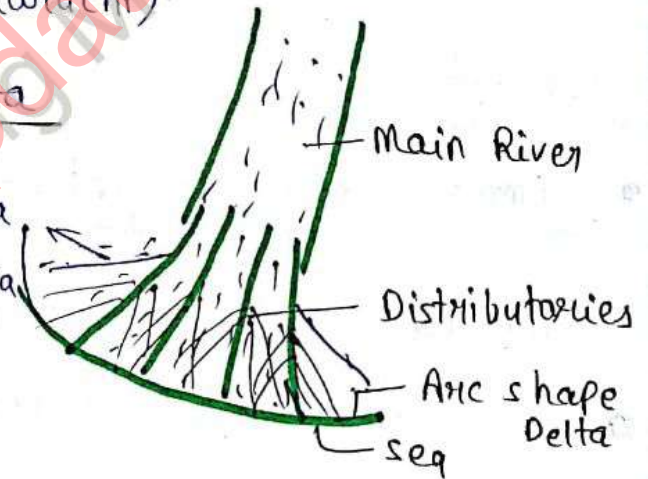
Origin - Chemo yung dung Glacier (in Tibet, China)  
or  
Manasarovar lake

Mouth or Merges into an ocean or Outflow of water into an ocean  
(मुहाना)

↓  
Into the Arabian sea

Formation of Delta - In Pakistan (Karachi)

↓  
Anicurate Delta

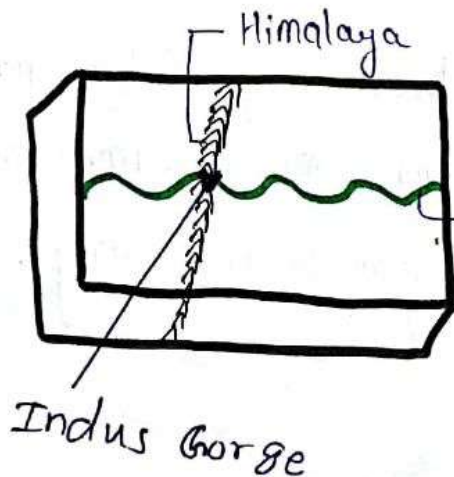


In Karachi  
● Ohangi (2008) → largest slum area of India Asia  
ओरांगी

↓  
इसके पहले धारावी (Maharashtra)

● सबसे कम Slum area = Bihar

largest slum area of the world - Rio-de-jerensio (In Brazil)

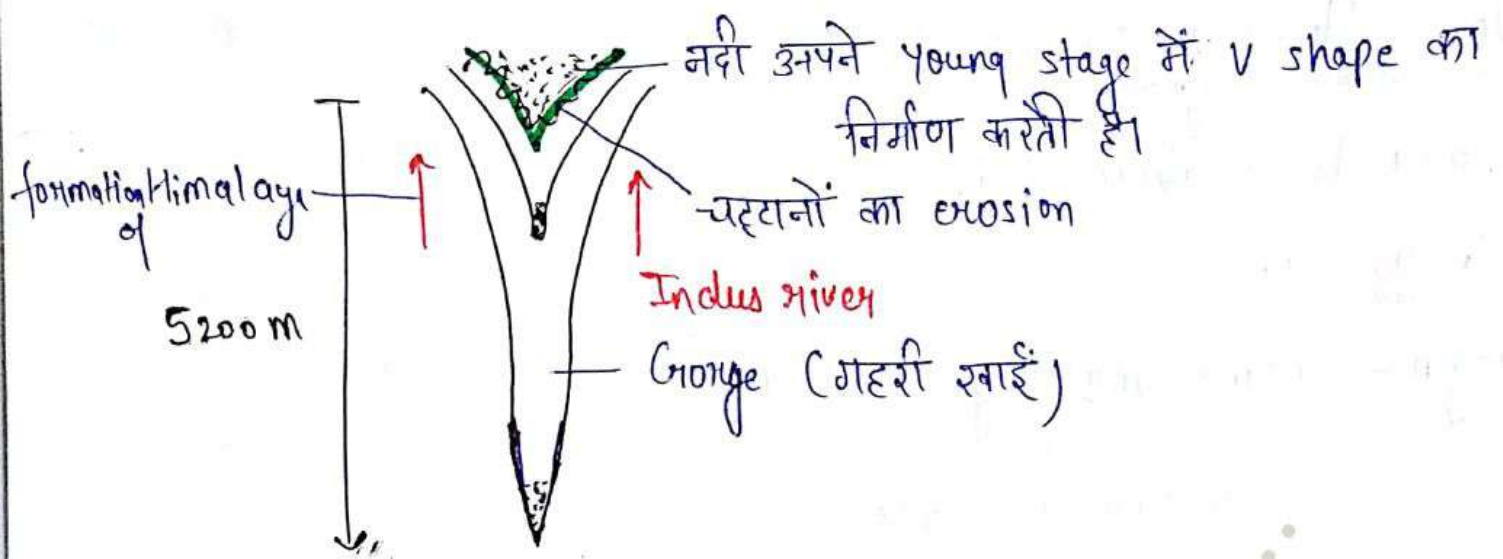


Indus River

Antecedent River

हिमालय से पूर्व की नदी





- It is an example of Antecedent River.
- It makes an Indus Gorge at Nanga Parvat in J and K (POK) (In Bunji)

### Projects :-

#### • Nimmo Bajgo Project :-

Situated in J and K near Indus river.

- Indus river flows between Ladaakh and Zaskar range.

### Tributary river of Indus :-

From right side -

1. Gilgit river - It originates from Afghanistan passing to Pakistan and connects to Indus river in Jammu and Kashmir.
2. Shyok river - It originates from Ladaakh range.

3. Nubra river - It originates from Siachin Glacier.

From left side -

Nubra valley - J&K.

1. Jhelum River -

**Origin** - Beringal or Sheshnag Lake (in J&K)

• It makes a border between India and Pakistan.

• Projects of Jhelum River -

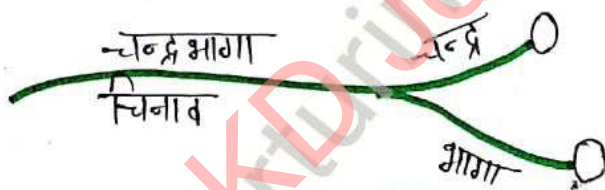
Kishanganga - Tributary of Jhelum

a. Tulbul (in J&K)

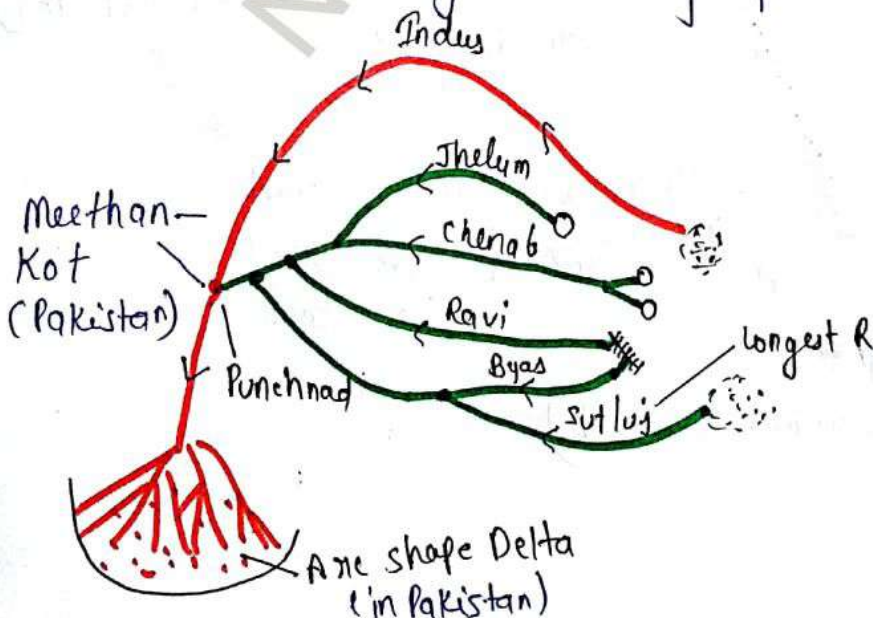
b. Kishanganga or Neelum Jhelum (in J&K)  
(Tributary river of Jhelum)

2. Chenab River - Also called Chandrabhaga river.

**Origin** - Confluence of Chandrabhaga river and Bhaga river in Himachal Pradesh.



• Chenab river is largest tributary of Indus.



## Projects of Chenab River -

- a. Salal
  - b. Dool hasi
  - c. Baglihar
- } — in Jand K

## 3. Ravi River -

**Origin** - Rohtang Paas in Himachal Pradesh

Project of Ravi River -

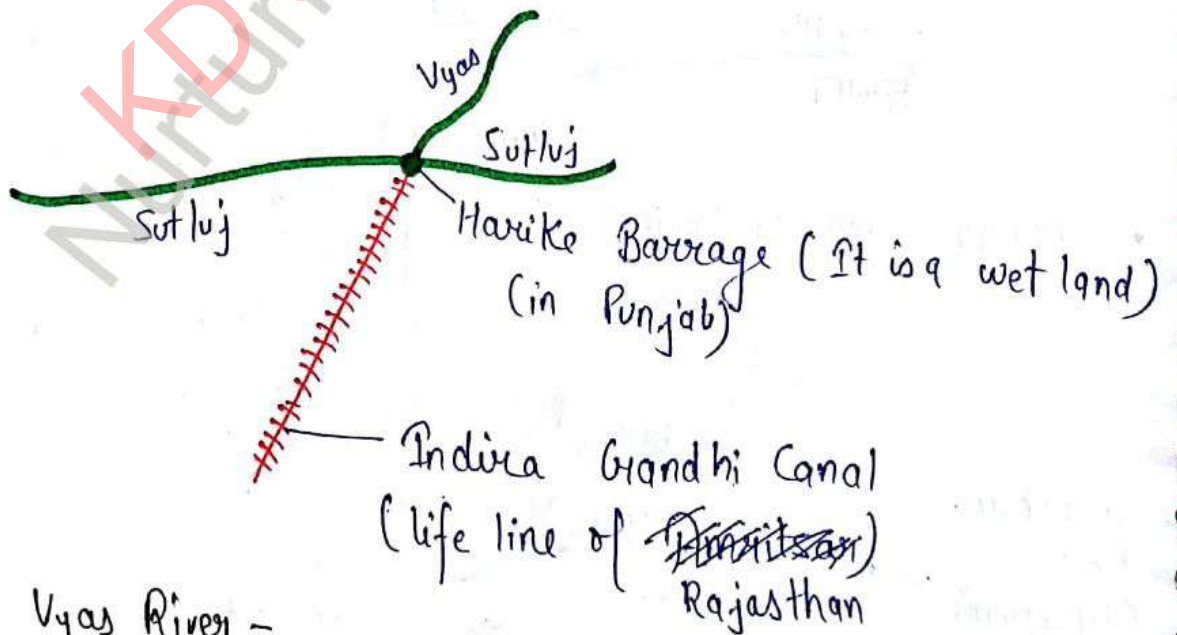
Thein Dam / Ranjeet Sagar Project (In Punjab)

## 4. Vyas River -

**Origin** - Rohtang Paas in Himachal Pradesh.

Vyas Kund से निकलती है Vyas River.

- It only flows in India.



Project of Vyas River -  
Pong Dam (in Himachal Pradesh)

## 5. Sutluj River :-

**Origin** :- Rakastal lake (Tibet, China)

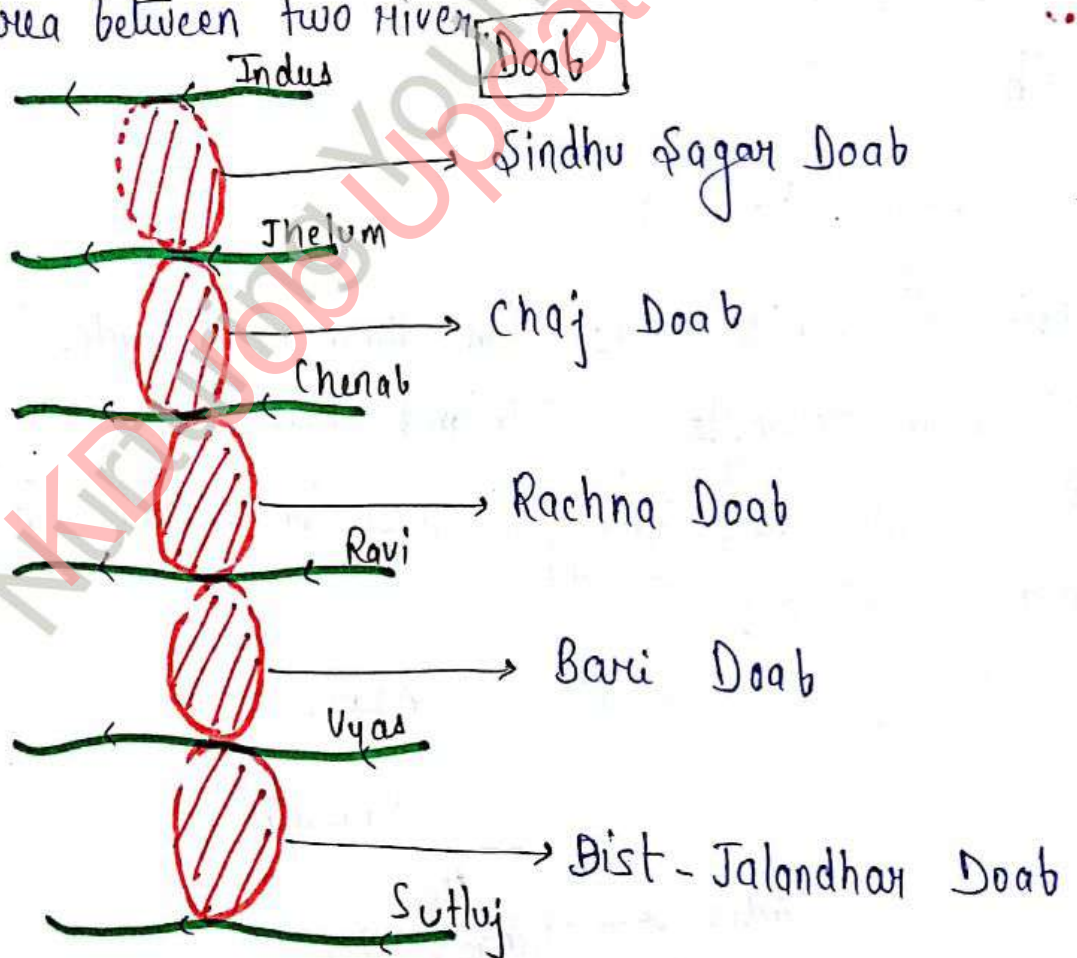
- It is an example of antecedent river.
- It makes a shipkila Gorge in Himachal Pradesh.

Project of Sutluj River -

- a. Bhakra - Nangal Dam (in Himachal Pradesh and Punjab)
- b. Nathpa Thakri (in Himachal Pradesh)
- c. Cold Dam (in Himachal Pradesh)

## Doab :-

It is a land area between two rivers



# Indus River Water Agreement :-

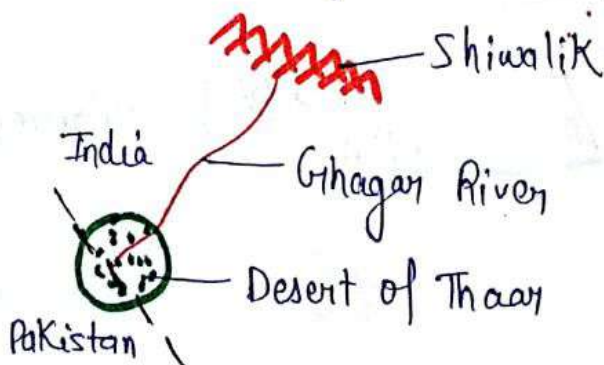
- In 1960

River	Right utilisation of water
1. Indus	80.0% - Pakistan
2. Jhelum	20.0% - India
3. Chenab	
4. Ravi	100.0% - India
5. Vyas	
6. Sutluj	

## 2. Ghaggar River :-

Origin - Shiwalik Hills (in Himachal Pradesh)

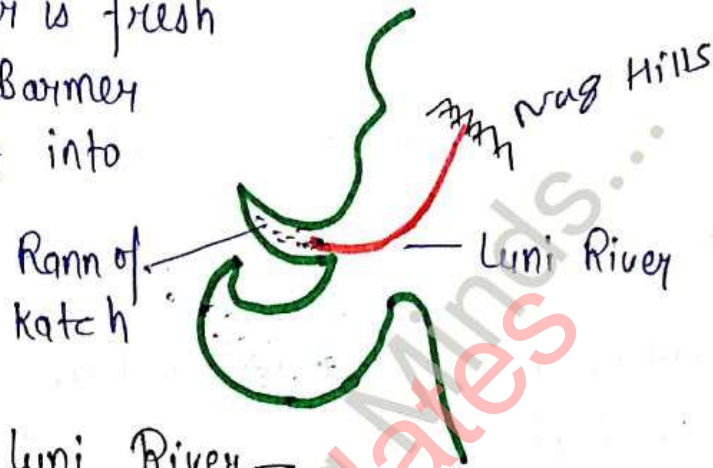
- It is an example of 'Inland River'.
- In recent time, Ghaggar River को सरस्वती नदी के संदर्भ में खोजा जा रहा है।
- It disappears in desert of Thaar.



### 3. Luni River :-

Origin :- Nag Hills (in Ajmer, Rajasthan)

- It is an example of "Inland River".
- It merges into Rann of Kutch (marshy area)
- Water of Luni River is fresh water till Balotra, Barmer then, after it convert into fresh water.



Tributary River of Luni River -

1. Javari
2. Sukari
3. West Banas

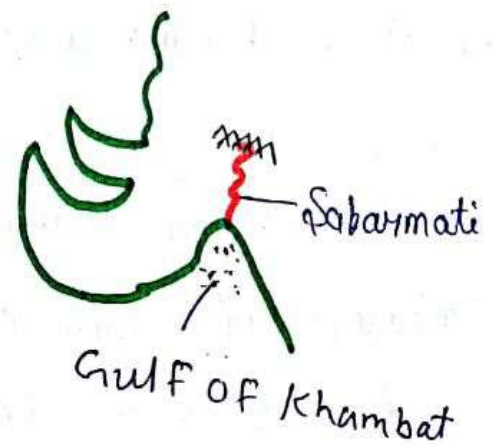
Rann of Kutch  
- Marshes Land  
રણરણી ઘાટ

### 4. Sabarmati River :-

Origin - Jarga Hills, Anavali Mt.  
(Udaipur, Rajasthan)

Mouth - Gulf of Khambat

- It is a river of two states -
  1. Rajasthan
  2. Gujarat



## 5. Mahi River:-

Origin:- Vindhyan Mountain (in Madhya Pradesh)

• Mahi river crosses two times a tropic of cancer.

• It is a river of 3 states — MP  
Rajasthan  
Gujarat

Dam — Mahi Bajaj Sea (in Gujarat)

## 6. Narmada River:-

Origin:- Amarkantak Plateau (in Madhya Pradesh)

Mouth:- Gulf of Khambat

Delta:- Estuary Delta / उत्तरनमुख डेल्टा

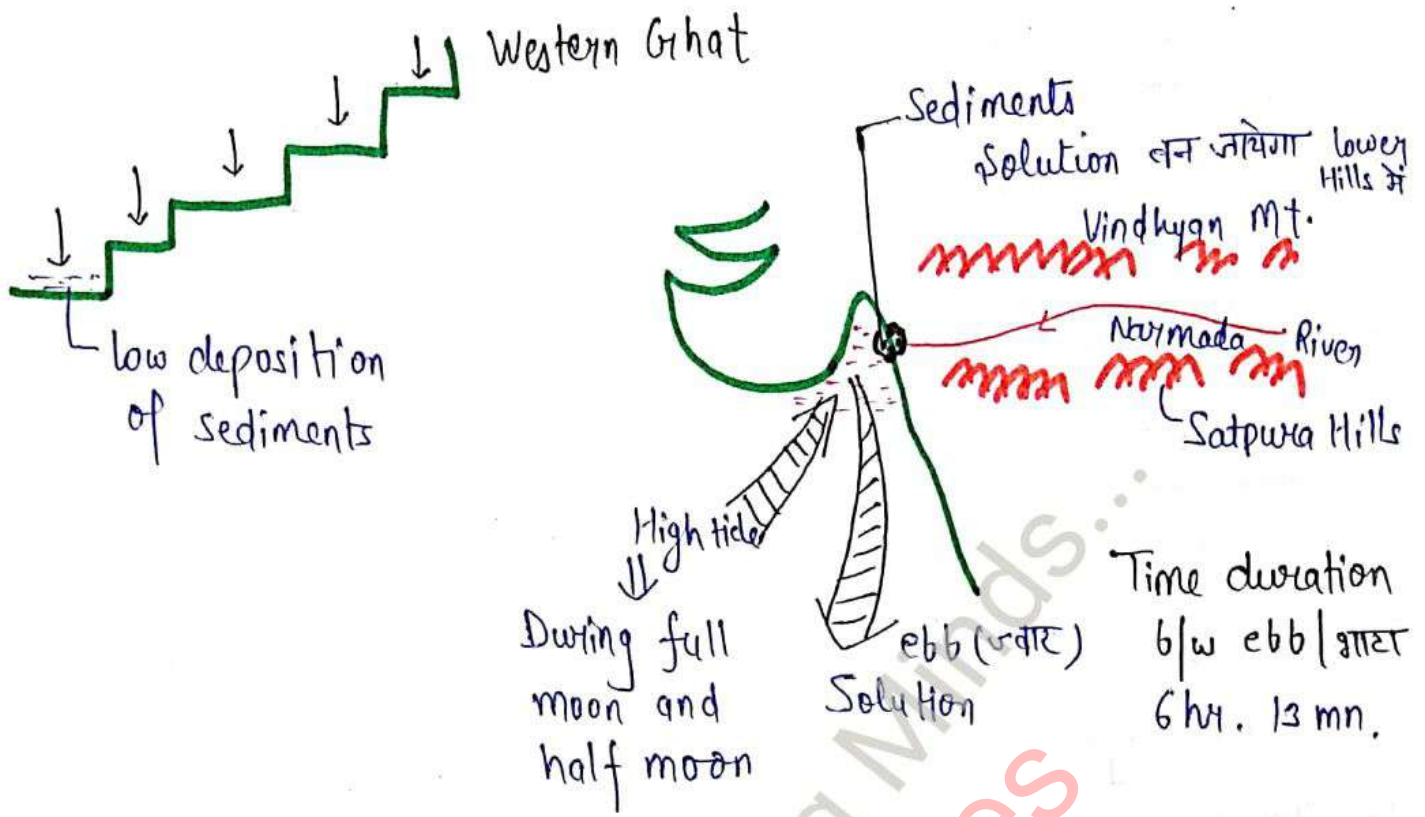
- Largest west flowing river of India.
- Narmada river flows through Rift valley in b/w Vindhyan and Satpura Hills.

Project of Narmada River -

- a. Sardar Sarovar Dam (Gujarat)
- b. Indira Sagar (Madhya Pradesh)
- c. Omkareshwar Dam (Madhya Pradesh)

Tributary River of Narmada River -

- a. Tava River
- b. Dudhi River
- c. Sher River



7. Tapti / Tapi River:-

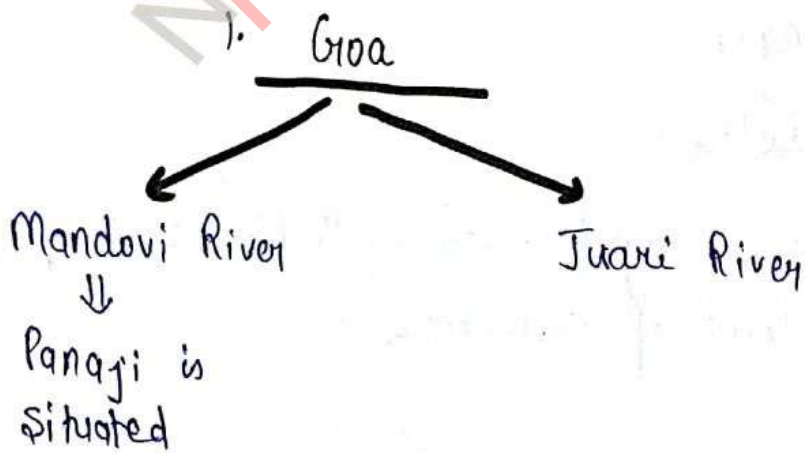
Origin :- Multani Hills (in Madhya Pradesh)

Mouth :- Gulf of Khambat

Delta :- Estuary Delta (ज्वारनदमुख डेल्टा)

Projects of Tapti River :-

- a. Ukai
  - b. Kakrapar
- } In Gujarat





## 2. Karnataka:-

- a. Sravati River
- b. Tadi River
- c. Bhadra River

## 3. Kerala:-

- a. Periyar
- b. Bharat Puzha
- c. Malam Puzha
- d. Pamba

## East flowing Rivers:-

→ Towards Bay of Bengal

### 1. Brahmaputra River:-

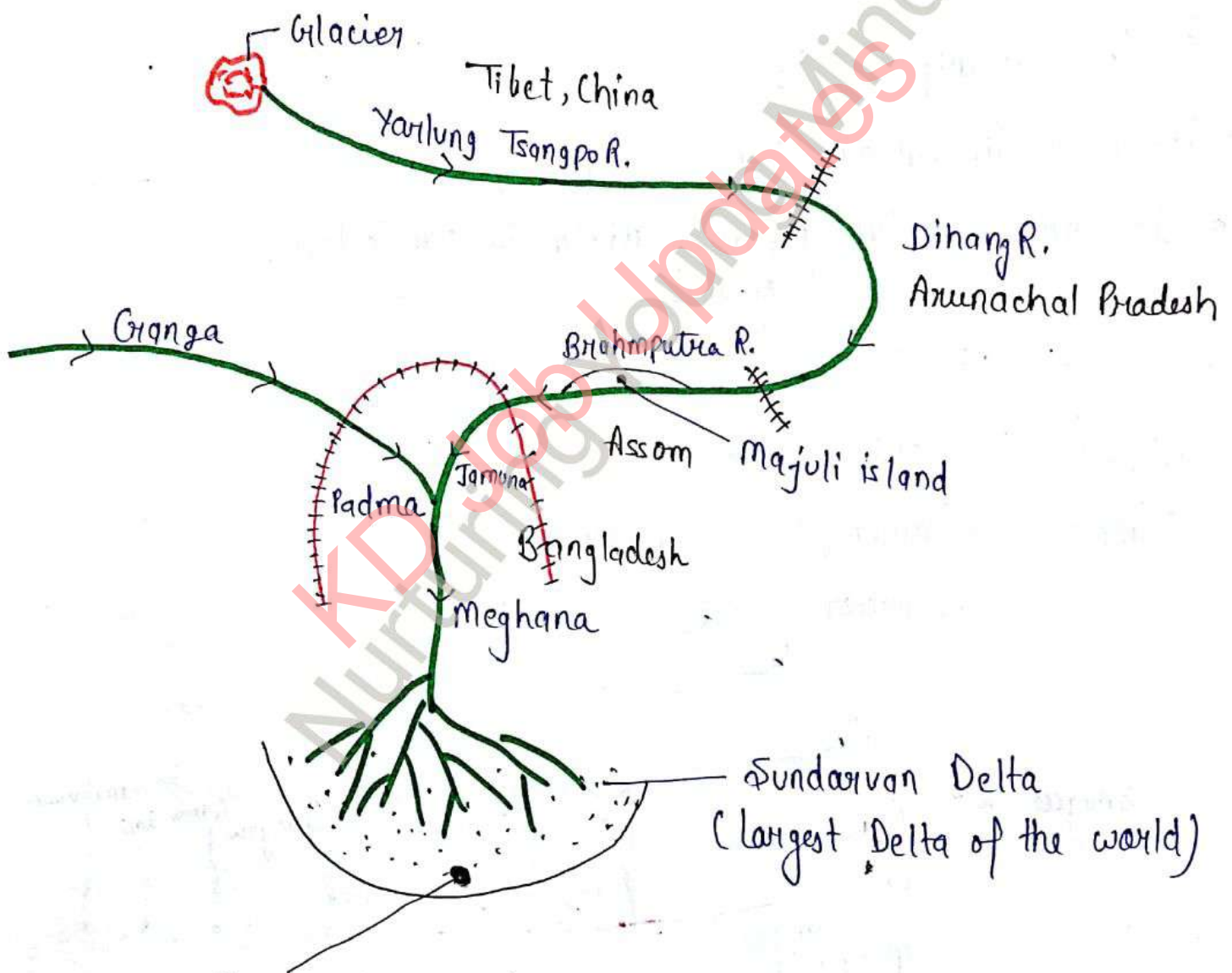
Origin:- Mansarovar Lake or Angsi Glacier  
(Tibet, China)

Mouth:- Bay of Bengal

Delta:- Arcuate Delta

- According to volume, largest river of India = Brahmaputra River.
- It carries maximum load of sediments.

- Max<sup>m</sup> flood occur in Assom due to Brahmaputra River in India.
- It is an example of Antecedent River.
- It makes a Dihang Gorge at Namcha Barwa mountain in Arunachal Pradesh.
- It makes a largest Riverine Island of the world.  
i.e., Majuli island



New moon Island = Dispute b/w India & Bangladesh  
 ↓  
 But now Island destroy ho gaya h.  
 submerge

## Tributary River of Brahmaputra River:-

- a. Tista - Sikkim (largest tributary of Brahmaputra River)
- b. Manas
- c. Dhansiri
- d. Subansiri
- e. Lohit
- f. Dibang
- g. Barak River -

} → Assam

} → Arunachal Pradesh

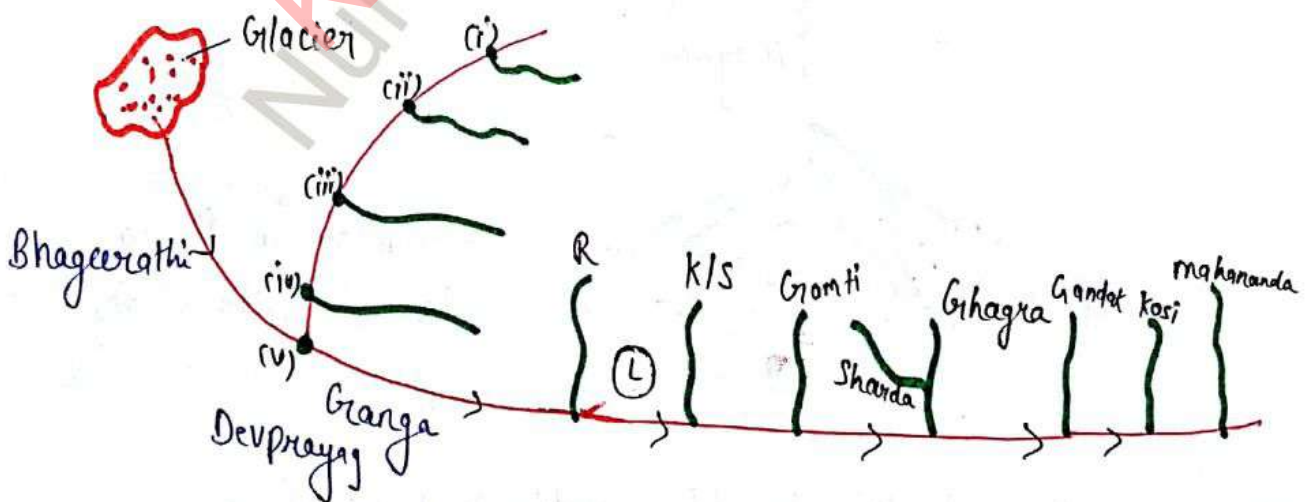
**Origin** - Manipur Hills

- Project - Tipaimukh Project (Manipur)
- It connects Brahmaputra River to Bangladesh. (Meghna)

## 2. Ganga River:-

**Origin**:- Gangotri Glacier

**Place**:- Gomukh, Uttarakhand.



- (i) Vishnu Prayag = Alaknanda + Dhouliganga
- (ii) Nand Prayag = Alaknanda + Nandakini
- (iii) Karna Prayag = Alaknanda + Pindar
- (iv) Rudra Prayag = Alaknanda + Mandakini ← Kedarnath Mandir इसी नदी के तट पर है।
- (v) Dev Prayag = Bhagirathi + Alaknanda

• According to length, Ganga is the largest River of India.

Tributary River of Ganga -

• From left side -

- a. Ram Ganga
- b. Kali/Saryu
- c. Gomti
- d. Ghagra
- e. Gandak
- f. Kosi
- g. Mahananda

Gomti River → It originates from Phulher lake in middle Ganga plain (Pilibhit, UP)

→ It not comes from nepal and Himalaya.

Gandak River -

In Nepal, it is called as Sadanira or Narayani River.

## Kosi River-

- In Nepal, it is called as Arun River.
- It is called as sonar of Bihar.

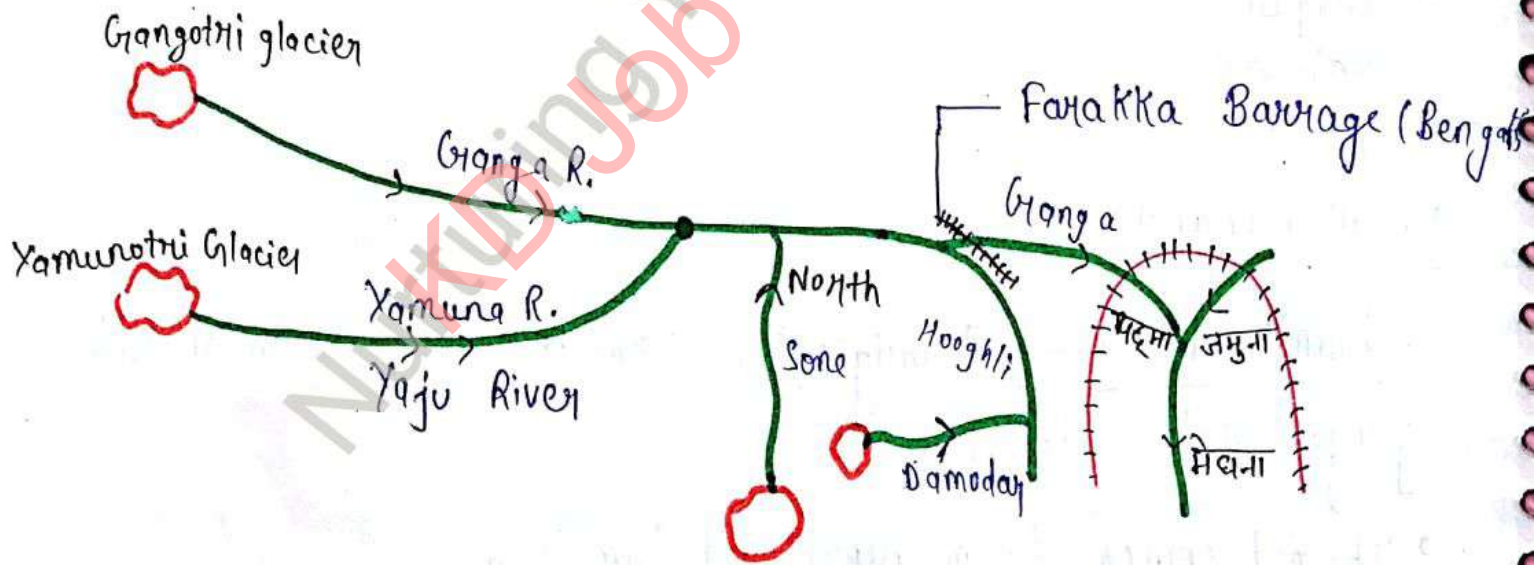
### From Right side-

a. Yamuna River - largest tributary of Ganga

Origin - Yamunotri glacier (in Uttarakhand) Place - Banderpooch, Uttarkashi

Tributary of Yamuna -  
Chambal - Sindh  
Ken - Tong  
Betwa  
Hindon

- Yamuna river is also called Yaju river because it flows parallel to main river Ganga.



Hugli river = Branch river of Ganga.

## b. Sone river -

**Origin** - Amarkantak plateau (in Madhya Pradesh)

- Only river of India which flows towards north.
- It flows through rift valley.

Projects of Sone river -

Bansagar project  
or  
Bansagar canal

• Tributary river of Sone river  
↓  
Rihand River

## c. Damodar river -

**Origin** - Chhotanagpur plateau, Jharkhand.

- It flows through rift valley.
- Damodar river is a tributary river of Hooghly.

## d. Chambal River -

**Origin** - Jonapao Hills (in Madhya Pradesh)

Tributary of Chambal -

1. Banda
2. Kalisindh
3. Parvati
4. Kshipra

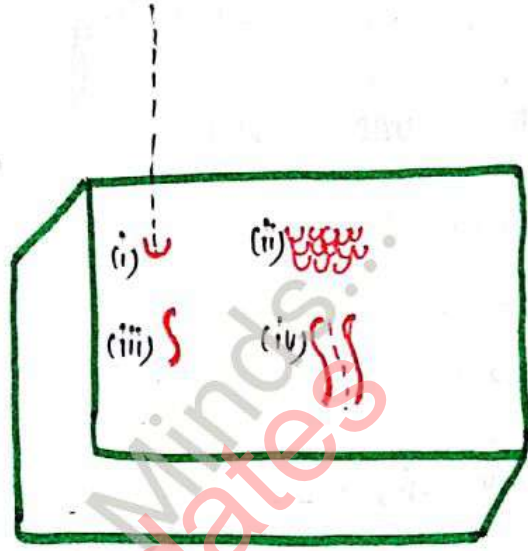
- Chambal river flows in 3 states - MP, Rajasthan, UP

↓  
Max<sup>m</sup> length of  
Chambal

- Chambal river is an example of superimposed river.
- It makes a Ravines or Bad lands through Gully erosion.

### Erosion (अपरदन) :-

- (i) Asfal erosion -  
From choplets of water
- (ii) Sheet erosion - By removing  
of one sheet
- (iii) Rill erosion -  
By removing more than  
one sheet.
- (iv) Gully erosion -  
From the rivers.



### Projects of Chambal river -

- a. Gandhisagar → in MP
  - b. Jawahar sagar
  - c. Ranapratap sagar
  - d. Kota Barrage
- } — in Rajasthan

- Chambal river connects to Yamuna river at Auraiya (new city) or Itawah (old city).

### 3. Swarna rekha River :-

Origin - Chhotanagpur plateau (Jharkhand)

2 states - Jharkhand + Bengal

Mouth - Bay of Bengal

### 4. Brahmini River :-

Origin - Chhotanagpur plateau

2 states - Jharkhand + Orissa

Mouth - Bay of Bengal.

### 5. Mahanadi River :-

Origin - Amarkantak Plateau or Sihava Range (Chhattisgarh)

Mouth - Bay of Bengal

Delta - Arcuate delta

### Rivers of South India :-

• Consequent river (follows through slopes).

#### 1. Godavari River :-

Origin - Tryambakeshwar, Nasik, Maharashtra

Mouth - Bay of Bengal

Delta - Arcuate delta



## Projects of Godavari River-

- Nizam sagar - Telangana
- Pochampad - Telangana
- Jayakwadi - Maharashtra

- According to length, largest river of Peninsular India / South India = Godavari
- India's second largest river after the Ganga = Godavari (1465 km.)
- It is called Ganges of South or Dakshina Ganga (Acc. to length)
- It is also called **old Ganga**.

## Tributary of Godavari-

- Vardha
- Indravati
- Penganga
- Venganga
- Kinner Sani
- Manjira → Largest tributary of Godavari

## 2. Krishna River:-

Origin - Mahabaleshwar (Maharashtra)

Mouth - Bay of Bengal

Delta - Arcuate delta

Dam - Almatty (Karnataka)

Tributary of Krishna River -

a. Bheema

b. Koyana

c. Ghatprabha

d. Malprabha

e. Musi

f. Tungbhadra → largest tributary of Krishna River.

Tungbhadra Project - Karnataka

Projects of Krishna River -

a. Nagarjuna sagar (Andhra Pradesh)

3. Cauveri River :-

Origin - Brahmagiri mountain (Karnataka)

Mouth - Bay of Bengal

Delta - Arcuate

Dam - Mettur Dam (Tamil Nadu)

Tributary of Cauveri River -

a. Bhawani

b. Amravati

c. Shimsa

d. Suvarnavati

e. Ankavati

f. Hemavati → largest tributary of Cauveri river.

Project of Cauveri River -  
Krishnaraj sagar (Karnataka)

Cauveri river water dispute :-

1. Karnataka
2. Tamil Nadu
3. Kerala
4. Puducherry

3 Platforms for water dispute -

a. Art - 262 :- River water dispute

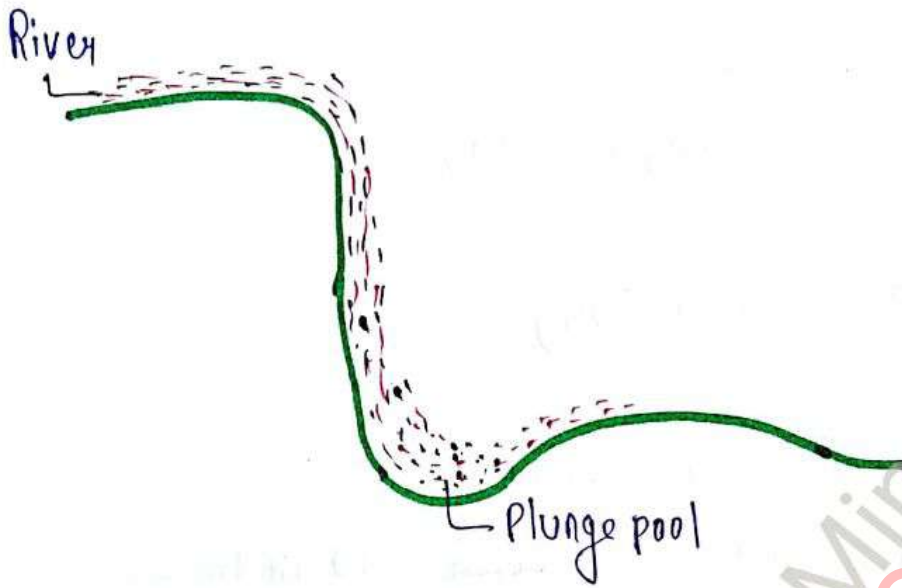
b. Art - 263 :- Inter state council

↓  
Head PM and Home minister, all states CM.

c. Niti Ayog - Head PM

4. Pennar }  
5. Vegai } → Tamil Nadu

## Water Fall :-



### 1. Jog of Garsoppa or Mahatma Gandhi fall :-

- River - Sharavati
- State - Karnataka
- Highest water fall of India (253 meter)

2. Shirsamudram }  
3. Stanley } - Cauveri River (Karnataka)

4. Hogenkal - Cauveri river (Tamil Nadu)

5. Yena - Maharashtra → In Bheema river

6. Gokul - Karnataka → Ghatspratha river

7. Doodhsagar - Mandovi River (Goa)

8. Chuliya - Chambal river (Rajasthan)

9. Hundw - Swarnarekha river (Jharkhand)
10. Dassam } Jharkhand
11. Jonha }
12. Dhuandhar - Narmada River  
Bhedaghat, Jabalpur (MP)
13. Kapildhara } Narmada River (MP)
14. Dugdhar }<sup>dh</sup>
15. Chitrakoot - Indravati river (Chhattisgarh)
16. Duduma water fall - Border of Orissa and Andhra.
17. Chachai - In Madhya Pradesh.
18. Kakolat water fall - Bihar
19. Kempty water fall - Mussooni (Uttarakhand)

## Multi purpose Projects

J.L. Nehru has said multipurpose projects as a temple of Modern India and New Pilgrim Place.

1. Damodar valley Corporation (D.V.C) project:-

River - Damodar River

State - Jharkhand

Established - 1948

- 1<sup>st</sup> multipurpose project of India.

- It is based on Tennessee River valley Project (USA).  
↓  
Tributary of Mississippi river (USA).

Dam → constructed on River

- a. Talaiya — Barakar River
- b. Panchet — Damodar River
- c. Konar — Konar River
- d. Maithan — Barakar River

## 2. Bhakra Nangal Dam Project:-

State - Himachal Pradesh and Punjab

River - Sutlej

Height - 226 m

- Highest - Gravity dam of the world.
- It is made up of total concrete.

**Artificial lake** = Govind sagar (Himachal Pradesh)

## 3. Tihri Dam Project:-

River - Confluence of Bhageerathi and Bheelangana River.  
(Uttarakhand)

State - Uttarakhand

Height - 261 m

- Highest dam of India.

**Artificial lake** = Swami Ramtirth Sagar (Uttarakhand)

#### 4. Hirakund Dam Project :-

River - Mahanadi

State - Odissa, Sambalpur.

Length - Total - 26 km.

One part - 4800 m

- longest Dam of the world.

#### 5. Rihand Dam Project :-

River - Rihand (Tributary of Sone River).

State - UP

Artificial lake / Reservoir :- Govind Vallabh Pant Sagar

UP and MP

ins.s.c

↳ in UPSC

- Largest artificial lake of India = Govind Vallabh Pant Sagar.

#### 6. Mayurakshi Project :-

River - Mayurakshi (Bengal)

#### 7. Muchhkund Project :-

Muchhkund (Odissa + Andhra)

#### 8. Mata Tila बाँध / Dam

River - Betawa

State - UP

#### 9. Rani Laxmibai Sagar Project

10. Rani Avantibai Sagar Project or Rajghat Project:-

River - Tapi

State - Madhya Pradesh

11. Idukki Project:-

River - Periyar river

State - Kerala

12. Tata Hydel Project:-

River - Bhoma

State - Maharashtra

13. Rangit Project:-

River - Rangit (Tributary of Tista)

State - Sikkim

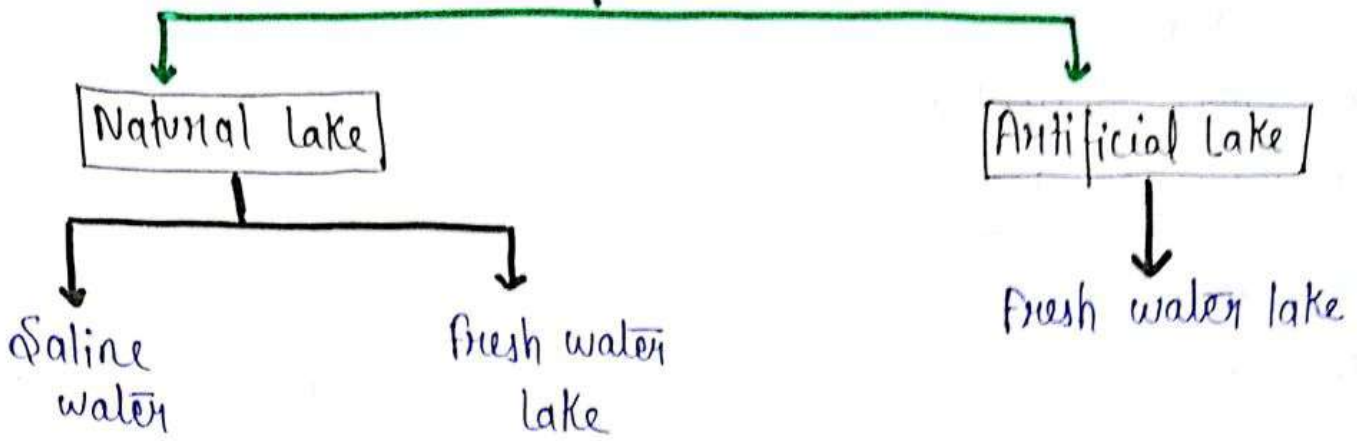
Bhutan : Project of Indian Government -

- Tala } Wang-chu River
- Chukha } Wang-chu River
- Sankosh → Sankosh River

↓  
Flows in Assam



# Lakes

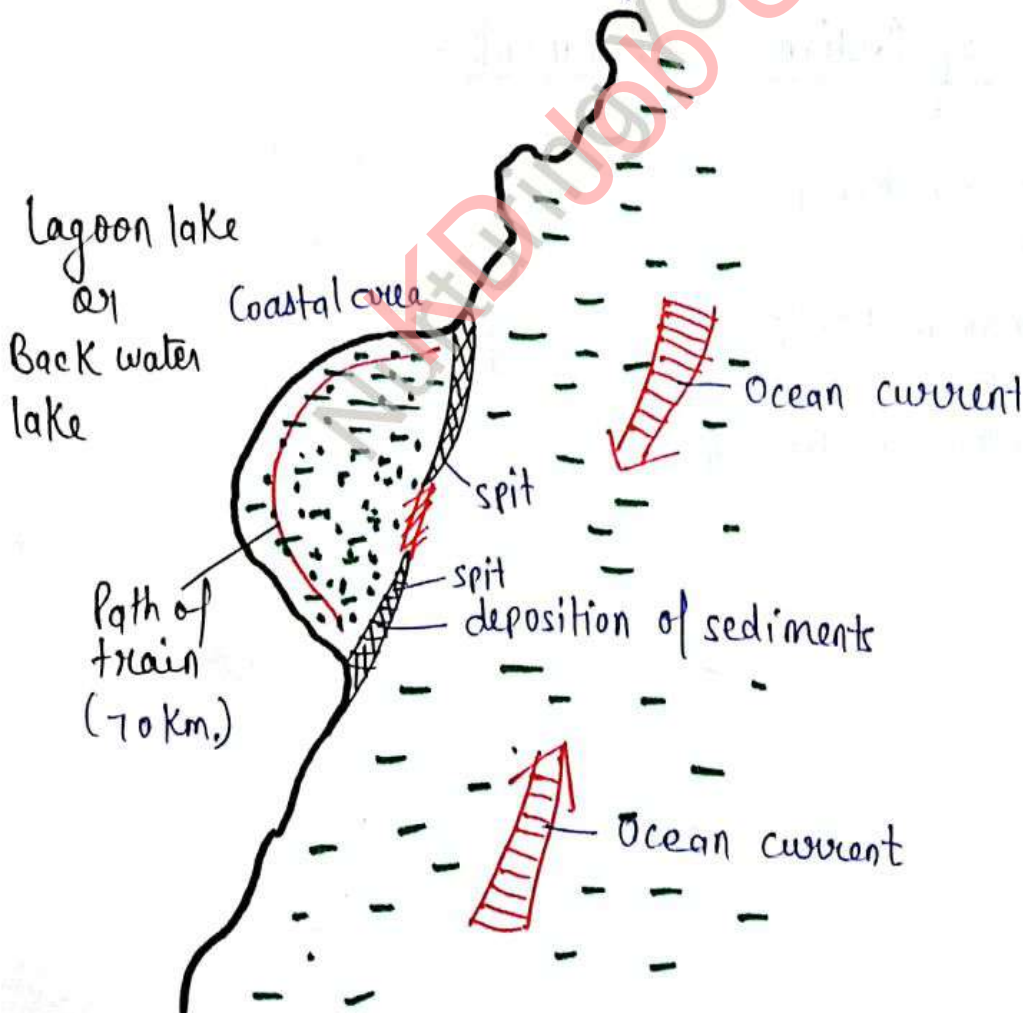


## Saline water lake :-

### 1. Chilka lake :-

State - Odisha

- Largest lake of India = Chilka lake
- It is an example of lagoon lake or Back water lake.



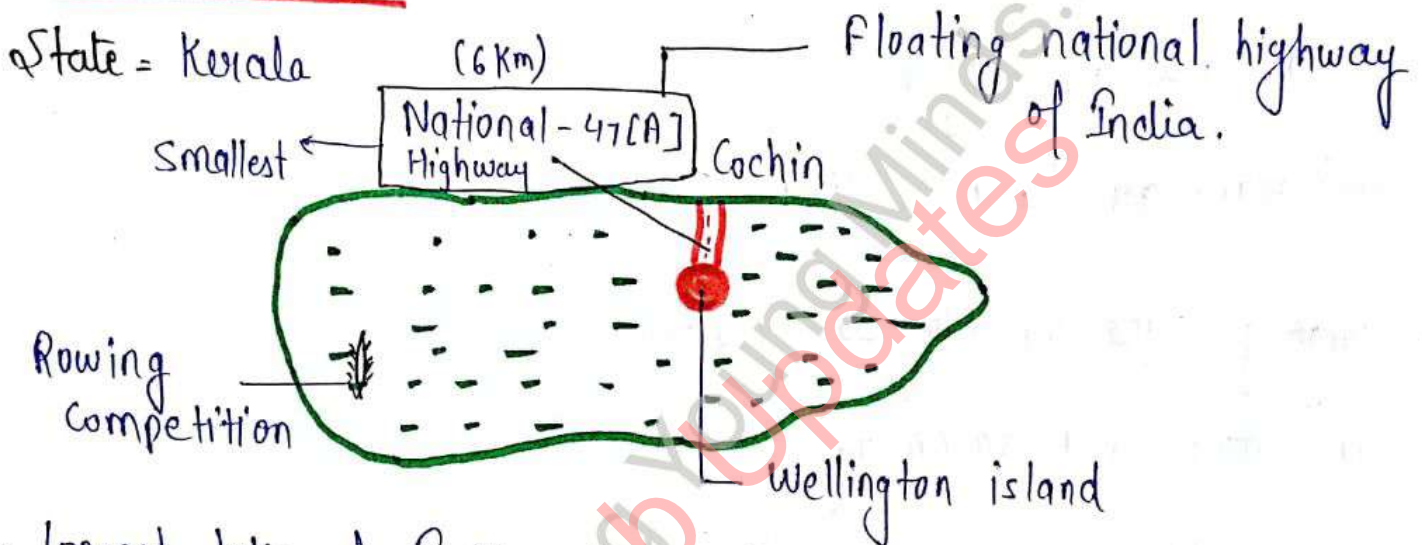
## 2. Puli Kat lake :-

Andhra Pradesh = 90 %  
and

Tamil Nadu = 10 %.

- It is an example of lagoon lake.
- Sri Hari Kota island is situated in this lake.

## 3. Vembanad lake :-



- longest lake of India = Vembanad lake.

## 4. Aushdamudi lake :-

State - Kerala

Note - Lagoon lakes / Back water lakes are called 'Kayal' at Malabar coast of Kerala.

## 5. Lonar Lake :-

- Buldhana district (Maharashtra)
- It is an example of crater lake or Meteorite lake.
- World largest crater lake of the world = Lonar lake

## 6. In Rajasthan →

### 1. Sambhar lake - in Jaipur.

- largest inland saline water lake.
- It is a residual part of Tethys sea.

### Note -

Mediterranean sea also residual part of Tethys sea.

### 2. Panchbhadra Lake - in Barmery

### 3. Deedwana - Nagor

### 4. Lunkaransar Lake - Bikaner

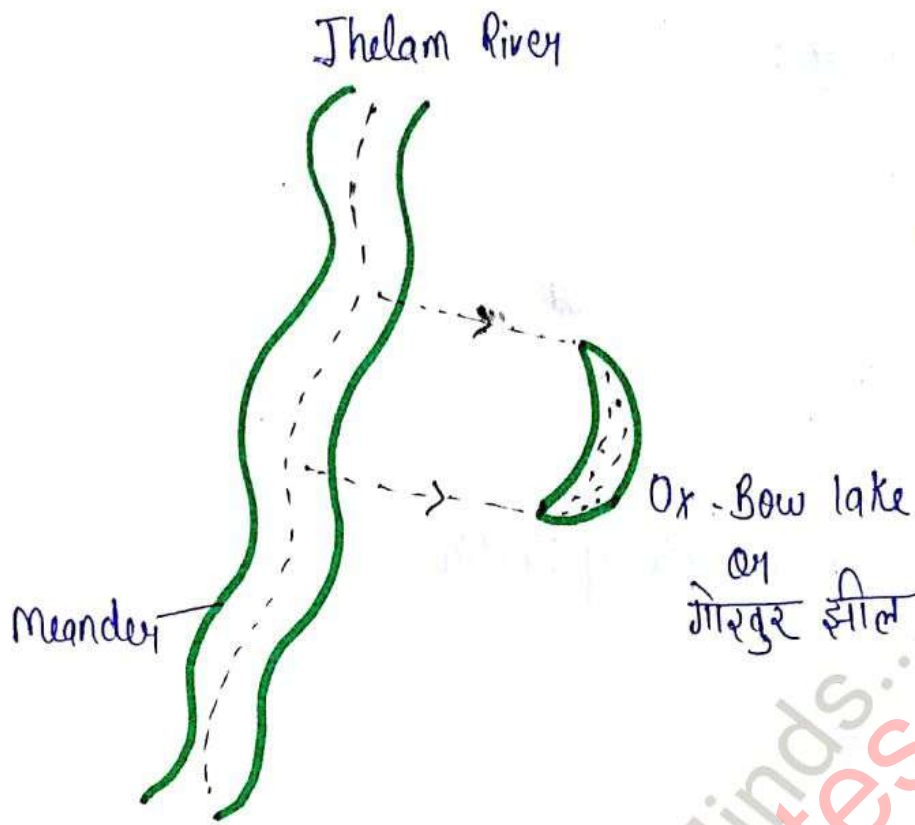
### 7. Pongong lake or Pongtso lake :-

In Jammu and Kashmir.

### Fresh water Lake :-

### 1. Wular lake :- in Jand K.

- largest fresh water lake of India.
- It is an example of ox Bow lake and plate tectonic lake. (Movement of plates is called plate tectonism).
- Wular lake connected with Jhelum River.



In plains, it is called as हाइन झील

## 2. Dal lake :- in J and K.

- इसमें शिकारा चलाया जाता है ।  
↳ House boat

→ All Nag-Nagin lake → in J and K  
such as . Sheshnag lake  
• Anantnag lake  
• Bering lake  
• Nagin lake

## 3. In Chandigarh :-

### 1. Suhana lake :-

- Rock Garden.

Note - Vrindavan Garden - Masoon, Karnataka.

#### 4. Himachal Pradesh :-

1. Chandera Tal
2. Renuka

#### 5. Uttarakhand :-

1. Nainital
2. Devtal = Highest lake of India
3. Bheemtal
4. Naukuchiatal
5. Khuripatal
6. Sattal

#### 6. Haryana :-

1. Bhadkal lake

#### 7. Rajasthan :-

1. Pushkar
2. Annasagar } → In Ajmer
3. Nakki lake → Mt. Abu

#### 8. Udaipur → Lake city :-

1. Pichhola
2. Udaisagar
3. Jaisamand
4. Fatehsagar

9. Kolleru lake :- → In Andhra Pradesh

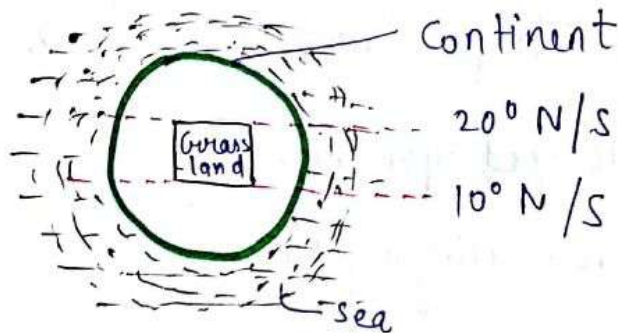
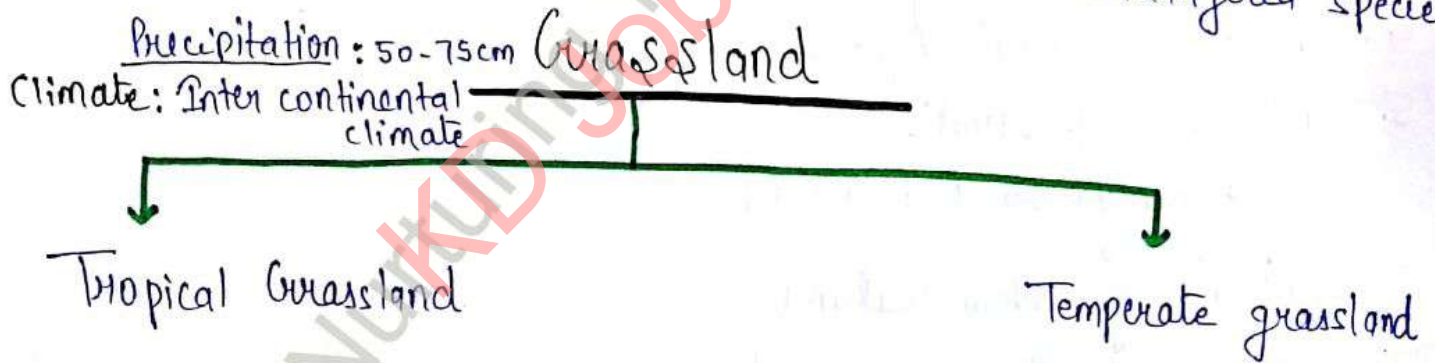
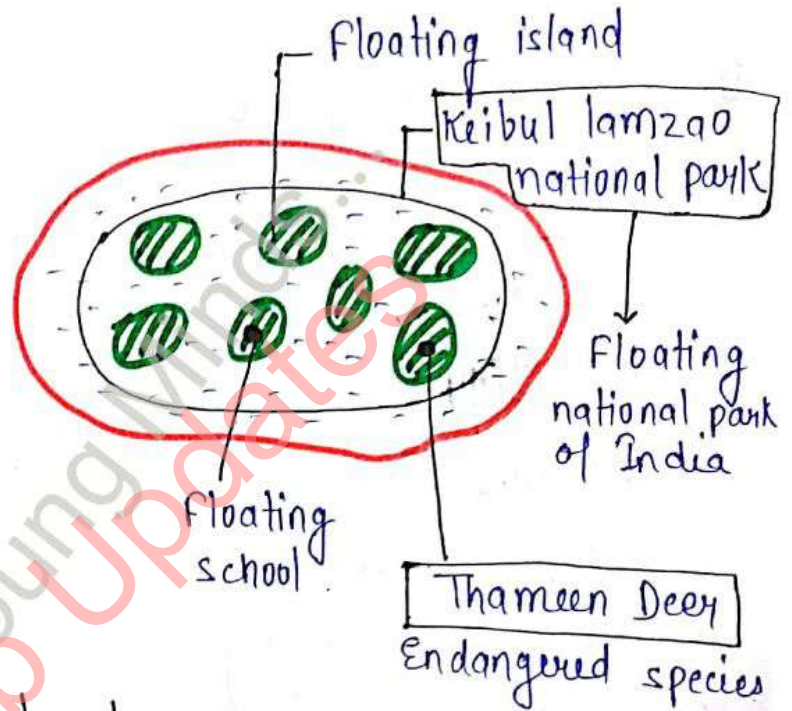
- It is an example of 'Delta lake'.
- It is situated b/w delta of Godavari and Krishna river.

10. Umiam lake :-

- In Meghalaya.

11. Loktak lake :-

- In Manipur.
- largest lake of North-East
- Floating islands are found.

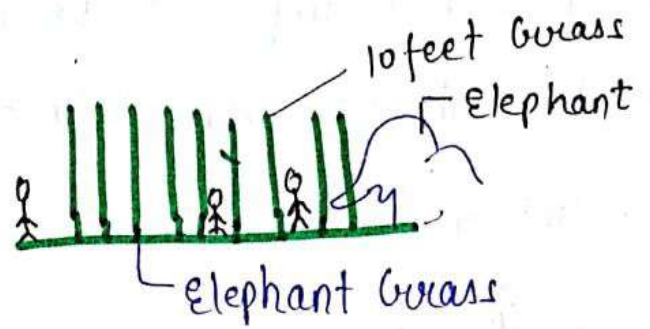


## Tropical Grassland :-

### 1. Savanna type Grassland :-

Place - a. Savanna - Africa

- It is called as land of hunting.



b. Lanos :- Venezuela

c. Compas :- Brazil

## Temperate Grassland :-

1. Prairies - USA

2. Steppes - Europe

3. Pustaz - Hungary

4. Veld - South Africa

5. Downs - Australia

↳ Kangaroo पाये जाते हैं।

6. Canterbury - New Zealand

7. Pampas - Argentina and Uruguay

- Grass - Alfa - Alfa (nutritious grass).

↓  
Cattle feed upon this.

- Slaughter house = frigorificious

Note - Packaged meat exporting (largest) = Argentina

## Crops

Kharif crops :-

Sowing - June - July  
on set of monsoon

1. Rice / Paddy

2. Maize

3. Cotton

4. Jute

5. Groundnut

6. Jowar

7. Millets (बजरा)

Harvesting - Oct. - Nov.

Rabi crops :-

Sowing - Oct. - Nov.

Harvesting - March - April

1. Wheat

2. Mustard

3. Barley

4. Gram

5. Peas

6. Pulses

7. Oilseed

- It requires a well-settled irrigation facility.



In Bengal -

3 Types of varieties of rice is grown -

1. ओस
2. अमन
3. बोरो

Jaid crops :-

Sowing - March - April

Harvesting - May - June

1. Flowers
2. Vegetables
3. Fruits

## FORESTS

National Forest Policy - 1952

Modified in - 1988

- According to 1988 policy atleast 33% of land area of India should be covered by forest.

At present :-

Dense forest = 21.5%

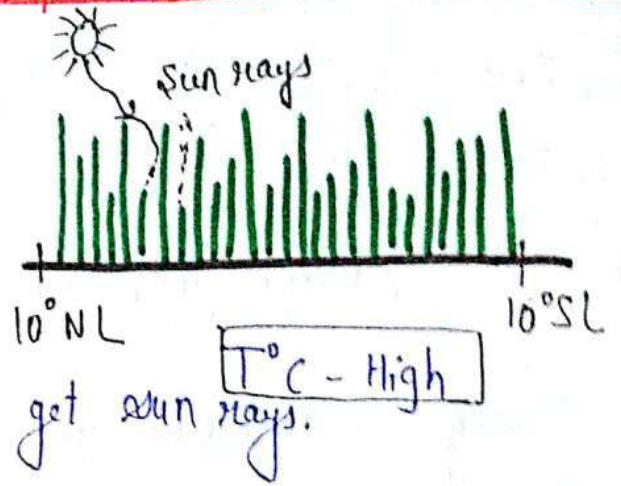
Total = 23.8%

- Max<sup>m</sup> forest covered area = Madhya Pradesh
- Min<sup>m</sup> forest covered area = Goa
- Max<sup>m</sup> % area = Mizoram (≈ 90%)
- Min<sup>m</sup> % area = Punjab (9.5%)

## Types of Forests :-

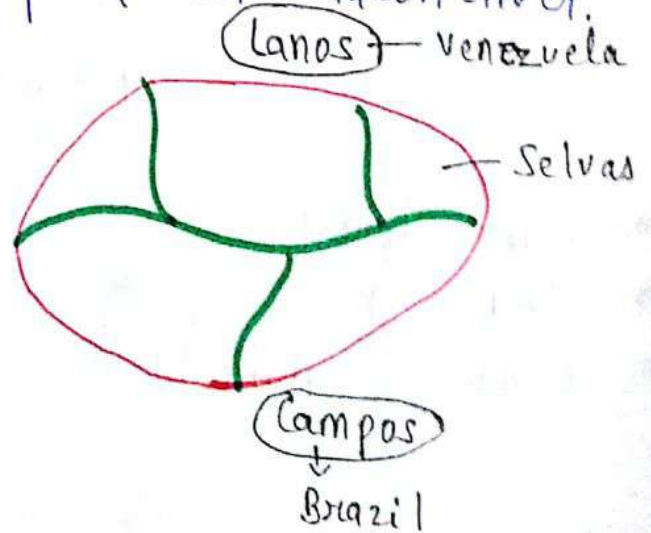
### 1. Evergreen Forest or Tropical Rain forest or Equatorial Forest :-

- Rain (Precipitation) :- 200 - 250 cm
- Height of Trees = 150 - 200 feet
- Dense forest
- Mixed Type trees
- These trees increase their height to get sun rays.
- Most bio-diversified area.
- Not better utilisation in timber and pulp industry.
- Trees are made of hard wood.
- Evergreen forest are called 'Selvas' in Amazon river valley, Brazil.
- Max<sup>m</sup> evergreen forest covered area is found in Amazon river valley, Brazil.
- Amazon river = Peru valley से निकलती है
- Walsa = Softest wood of world found near Amazon river.



## Types of Trees :-

1. Ebony
2. Mahogany
3. Rosewood
4. Aabrus
5. Bamboo - 2017 से हटाया गया ।



## 2. Deci

### Area of Evergreen forest:-

1. Western Ghats
  2. East Himalaya
  3. Eastern Hills
- 3 Hotspot of India

⇒ Hotspot concept was given by Norman Mayers.

Highly endangered species zone

- In world, total 35 hotspot areas are found.
- In India, total 3 hotspot areas are found.
- Most bio-diversified area of India - ~~By~~ Western Ghats.

## 2. Deciduous forest or Tropical forest or Monsoon forest :-

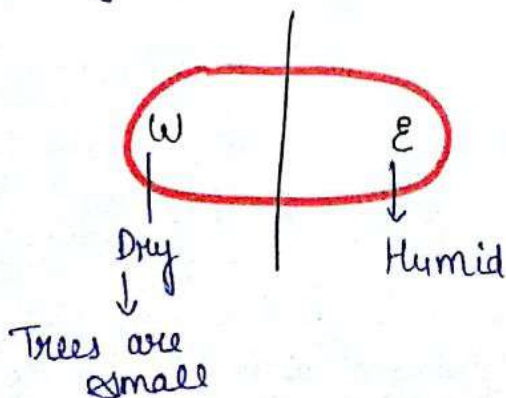
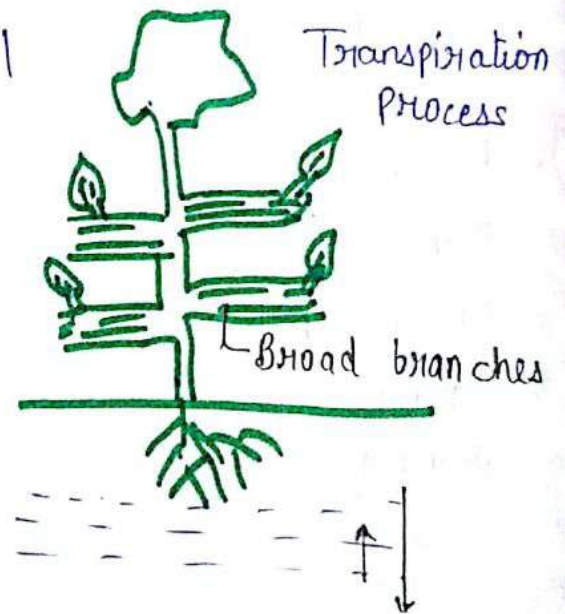
Precipitation → 150-200 cm - Humid Deciduous forest

→ 100-150 cm - Dry deciduous forest

- Tropical forest are called "Katinga" in Brazil.

4 month rainfall occur.

- Dense forest.
- Hard wood.
- Mixed type trees.



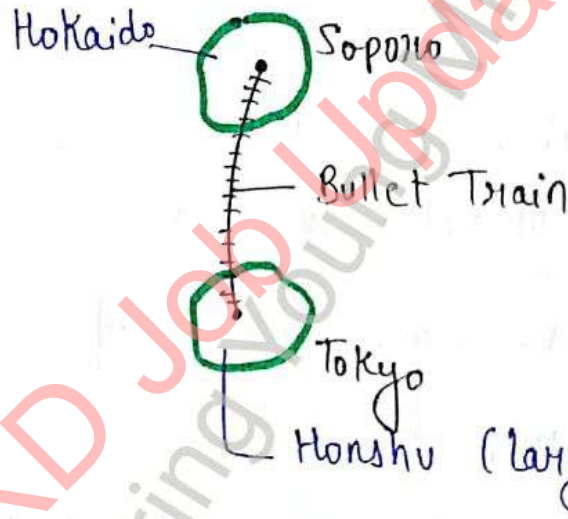
## Types of Trees :-

1. Sal
2. Teak
3. Mango
4. Neem
5. Peepal
6. Sandal wood
7. Banyan tree

## Area of Deciduous forest :-

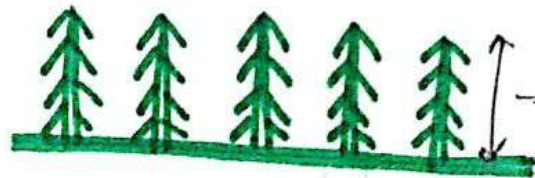
1. North of Middle India
2. Andaman and Nicobar

⇒ Japan की Bullet Train Soporoo को Tokyo से connect करती है



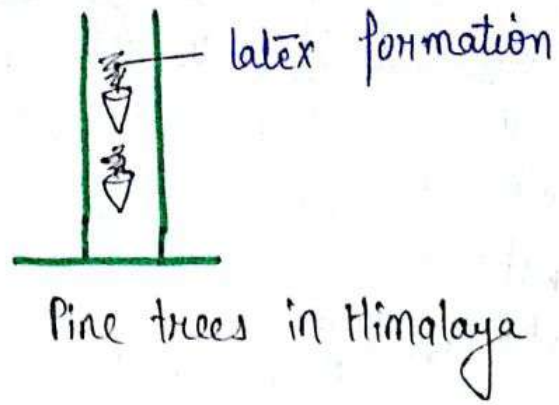
## 3. Coniferous forest :- on Temperate forest :-

- Precipitation = 100-150 cm
- Trees are of same size.
- Soft wood trees.
- Single type trees.
- Better utilisation in timber and pulp industry.



## Types of Trees :-

1. Oak
2. Birch
3. Maple
4. Red wood → 200 feet height
5. Chestnut
6. Poplar
7. Cedar (देवदार)
8. Pine trees



Pine trees in Himalaya

## Area of Coniferous Forest :-

1. Himalaya
2. Eastern Hills
3. Nilgiri, Annamalai; Palani Hills
4. Mangrove forest :- on Delta forest

- Water logging areas - Forests are found.
- Roots are found in air, water and soil.



example - Sundari Tree

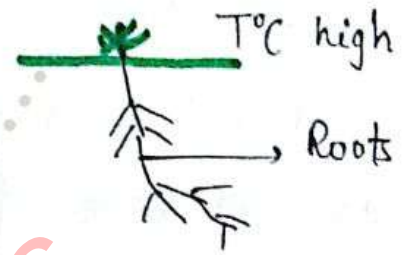
### Area -

1. Coastal areas
  2. Delta Region
- It protects from soil erosion and soil degradation, and the time of high tide and cyclone.

## 5. Desert forest or Dry forest:-

Precipitation  $\left\{ \begin{array}{l} \rightarrow 50 - 75 \text{ cm} - \text{Semi Arid} \\ \rightarrow 25 - 50 \text{ cm} - \text{Arid} \end{array} \right.$

- Trees are small in size but roots are deeply embedded to the search of water and moisture.
- leaves are spinous ~~from~~<sup>so</sup> the loss of transpiration protects.



### Types of Trees:-

1. Cactus
2. Khejri  $\rightarrow$  [राजस्थान की राजकीय वृक्ष]
3. Keekar
4. Acacia
5. Babool

### Area of Desert forest:-

1. Rajasthan
2. Gujarat

## 6. Boreal forest or Taiga forest:-

- $60^\circ - 70^\circ \text{ N.L.}$
- Himalaya  $\rightarrow$  North hemisphere - Trees are found
- South hemisphere में ये वृक्ष कभी नहीं मिलेंगे।

## 7. Tundra forest:-

- Found in Himalaya.

### Types of Trees -

1. Lichen
2. Mosses.

# Soil

## 1. Alluvial soil :-

- It occupies maximum 40% part of total land area of India.
- It is formed by deposition of sediments and silts which carries through rivers.

- Lack of Nitrogen, Phosphorus and Humus.

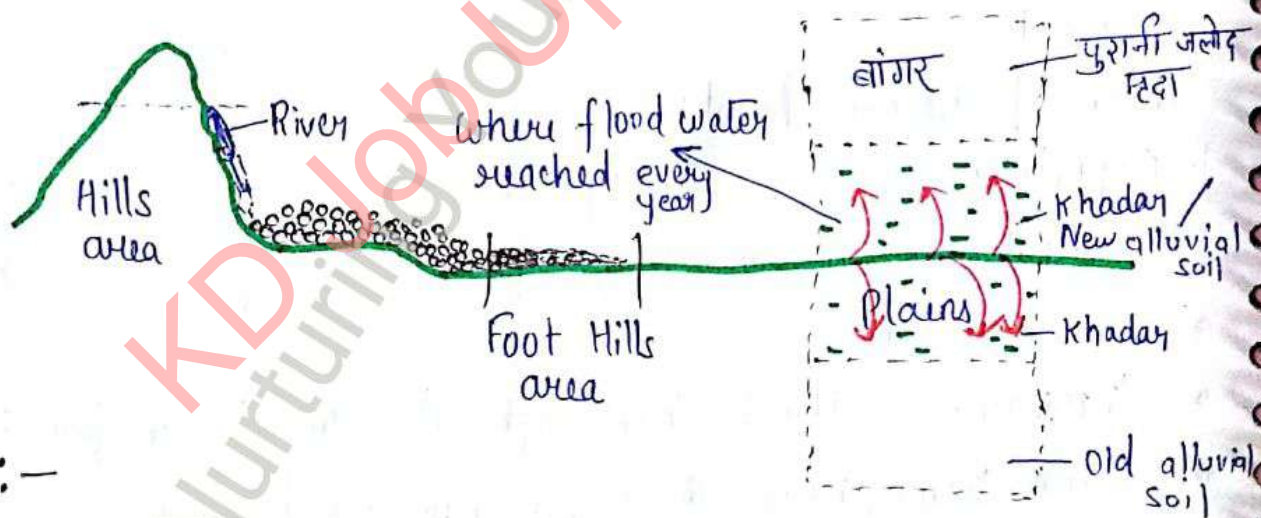
Humus :- It is a decomposed materials of biotic things.

- Max<sup>m</sup> presence of potash.

→ Potash is import from South East Asia.

- It is most fertile soil.

- Production of all kinds of crops in this soil.



## 1. Bhabar :-

- Hills area.
- larger size of Boulders (बहलानें)
- Permeability - High → River flows through lower layer of this area and some more it rivers can disappears on the surface of the earth.

## 2. Tarai :-

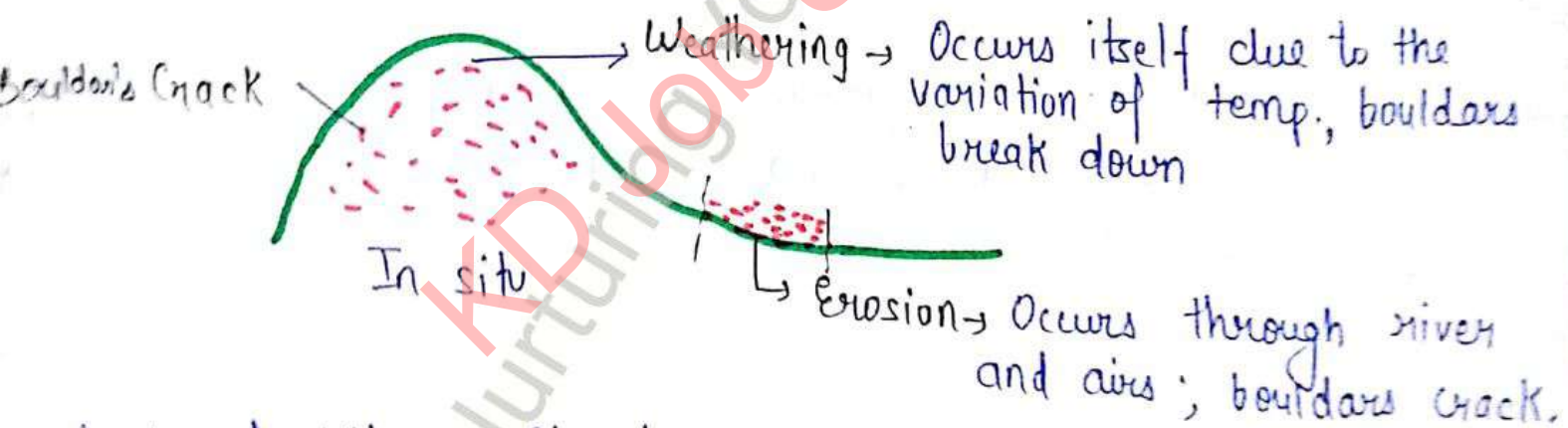
- Foot Hills area.
- Smaller size of rock particles.
- Permeability - low → Rivers can re-emerge on earth surface in this area.

## Area of Alluvial soil :-

- Plains of Indus, Ganga and Brahmaputra river.
- Coastal area.

## 2. Black soil :-

- It is formed by weathering and erosion process occurs over Basaltic lava deposited in Deccan Plateau.



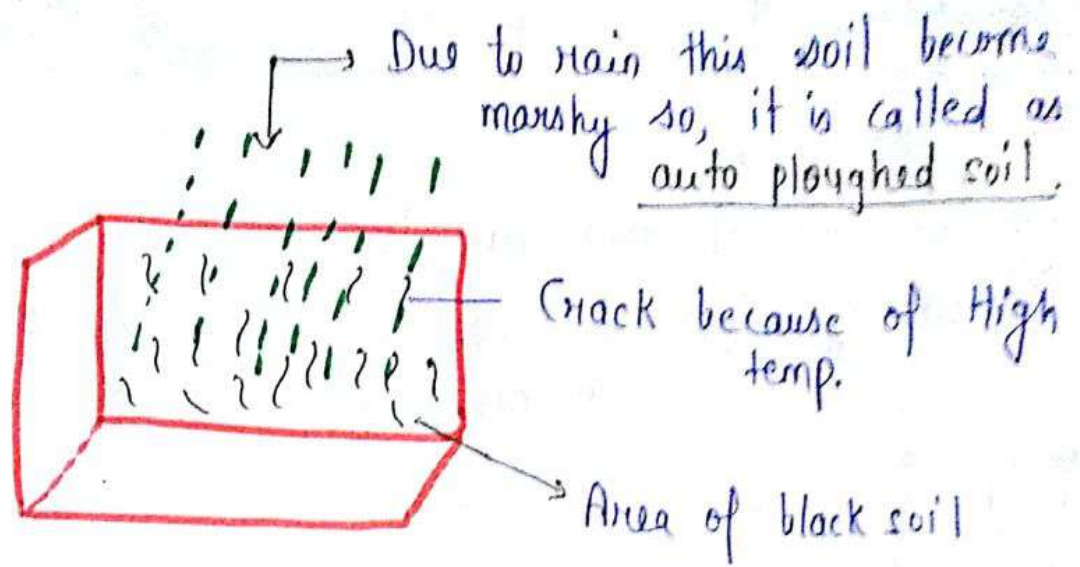
- Lack of Nitrogen, Phosphorus and Humus.
- Absence of potash.

In India → Total 2 soil having potash —

1. Alluvial soil (M<sub>2</sub>)
2. Black soil

- It is called Regur soil and cotton soil.
- Max<sup>m</sup> production of cotton and groundnut.





- Black soil is most water absorbing soil.

### Area of Black soil :-

1. Gujarat
2. Maharashtra
3. Madhya Pradesh
4. Karnataka

→ Malwa Plateau :- In Rajasthan, UP and MP  
 ↳ in west side of Bundelkhand.

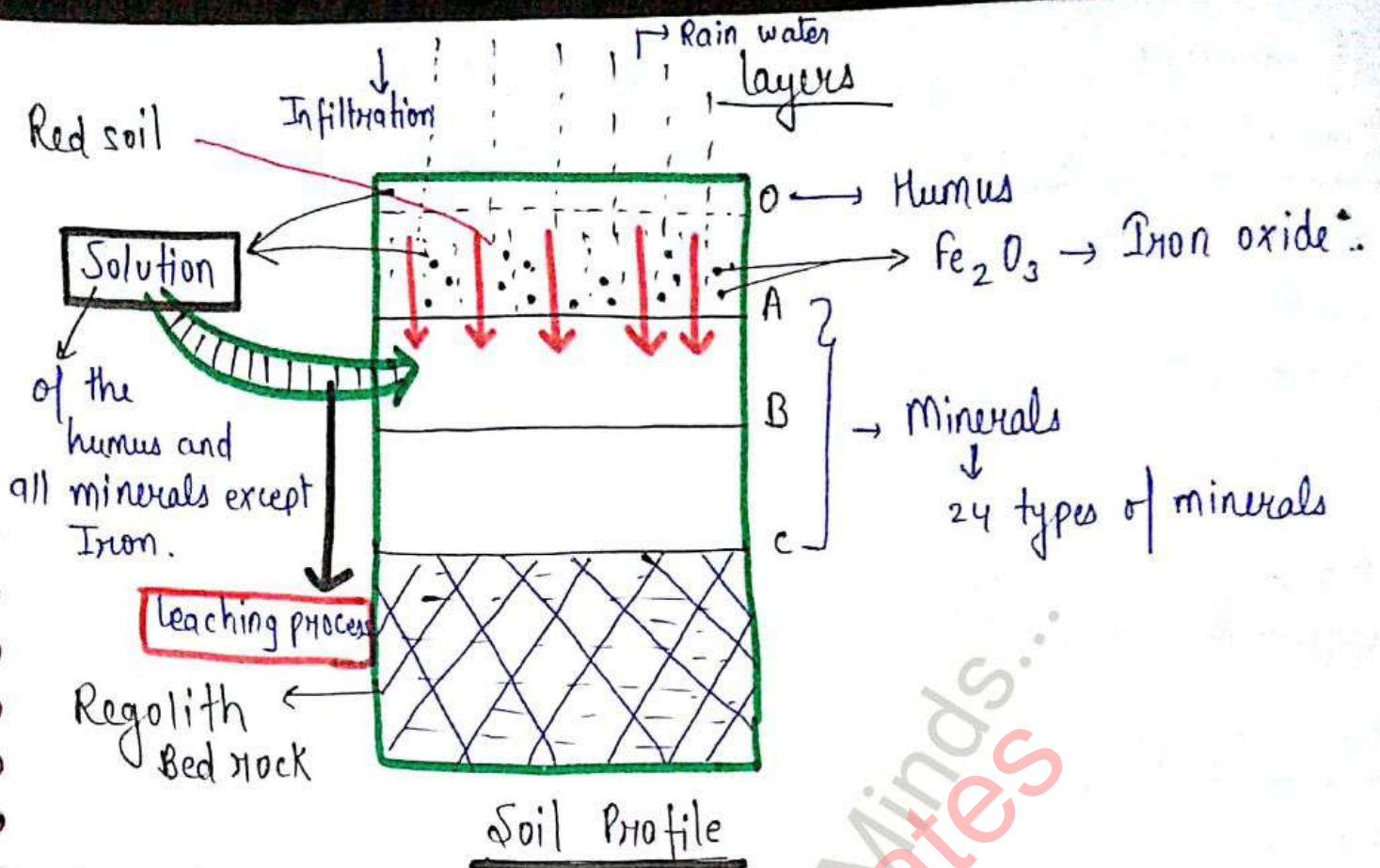
### 3. Red soil :-

#### Condition :-

- Hills and Plateau area.
- Granite and Gneiss type rock.
- 7-9 month rainfall.
- Leaching process.

→ Red soil is infertile soil.

→ Production of Tea, coffee and dry fruits.



### Area of Red soil:-

1. Western Ghat
2. North East India
3. East Himalaya

### 4. Laterite soil :-

#### Condition :-

1. Hills and Plateau area.
2. Granite and Gneiss type rock.
3. 3-4 month heavy rainfall.
4. 3-4 month high insolation (तेज सूर्यताप)
5. Leaching process.

- After leaching process when soil became as hard as brick due to 3-4 month high insolation; it is called as laterite soil.
- Production of Tea, Coffee and groundnut.
- laterite soil is infertile soil.

- It is used in construction of road and building.

### Area of laterite soil :-

1. South India
2. North East
3. Jharkhand, Chattisgarh, UP and MP.

### 5. Peat soil :-

- Marshy soil, infertile soil.
- water logging area.

### Area of Peat soil :-

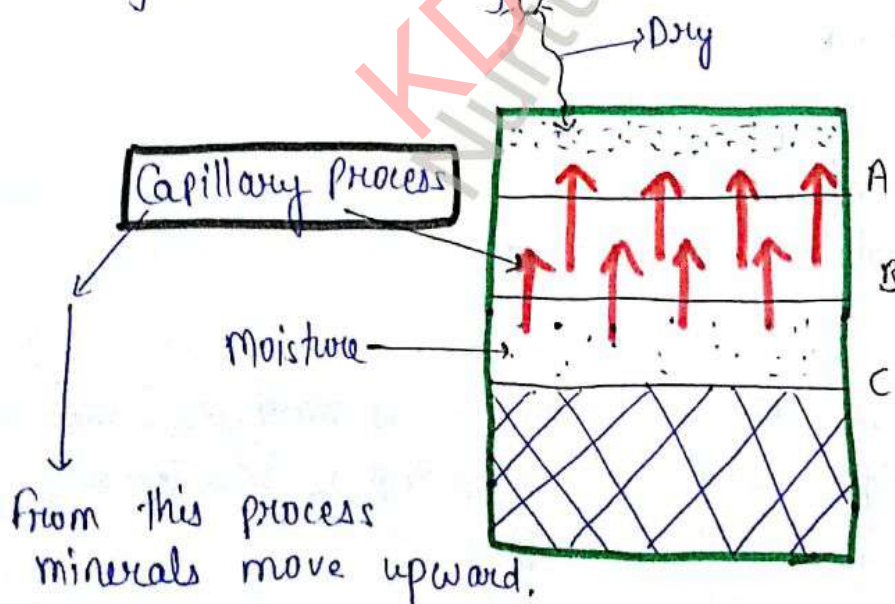
1. Deltaic region
2. Rann of Katch
3. Kerala

### 6. Desert soil :-

Infertile soil on saline soil, on Alkaline soil.

### Area of Desert soil :-

Rajasthan and Gujarat.



# Farming

## Subsistence Farming :-

- In India, more than 60% farmers are doing subsistence farming.
- In this farming; cultivators grows enough production of crops for the survival of their family only.

## Intensive Farming

- Developing countries
  - Cropland size < 2 ha
  - Less capital.
  - Less use of technology.
  - Lack of uses of High yielding variety of seed.
  - Less development of infrastructure (Road, Electricity etc)
  - Uses of traditional seeds.
  - Force on human labour.
  - Production = low
  - Productivity = High (Crop intensity = High)
- Because of 3 crops in a year in a one cropland.

## Extensive Farming

- Developed countries.
- Cropland size > 10 ha.
- High capital.
- High development of infrastructure.
- Uses of high yielding varieties of seed.
- High uses of technology.
- Production of crops = high
- Productivity = low

## Contract farming :-

In this farming, a legal agreement done between industrialist and cultivators for a fixed tenure in which cultivators has to grow production of crops to the choice of industrialist.

This kind of farming is known as **Truck farming** in U.S.A and **Suitcase farming** in Europe.

## Contour farming :-

- Done on slopes of Hills.
- Water lodging not occur.



## \* Mixed cropping or Multiple cropping :-

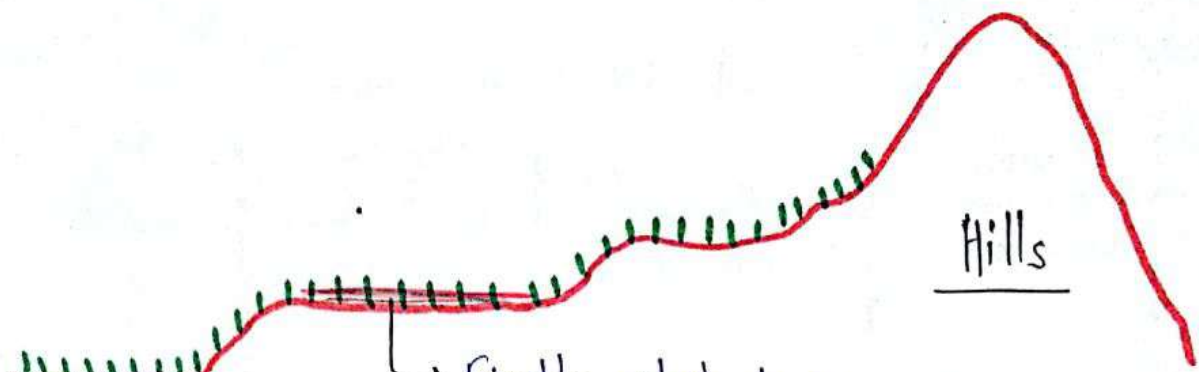
It is a form of poly-culture in which growing of two or more crops in the same cropland in same growing season.

## Mixed farming :-

In this farming which involves the growing of crops as well as raising of livestock or animal husbandry.

## Shifting Cultivation / Jhumming :-

- It is doing by the tribes on the slopes of Hills.



Firstly slash down the trees

After this set up a fire and it is called as 'slash and burn method.'

Ashes mixed in the soil and soil become fertile and they doing farming for 2-3 years and after this they leave their place. And when rain water falls there is soil erosion occurs and chances of landslides is high.

In Europe, this type of farming is known as **Bush Fello**.

- |                    |                   |
|--------------------|-------------------|
| 1. Jhoom           | Assom             |
| 2. Podu            | (North East Area) |
| 3. Bevar or Dahiya | Andhra Pradesh    |
| 4. Chimata         | Madhya Pradesh    |
| 5. Kumari          | Rajasthan         |
|                    | Kerala            |

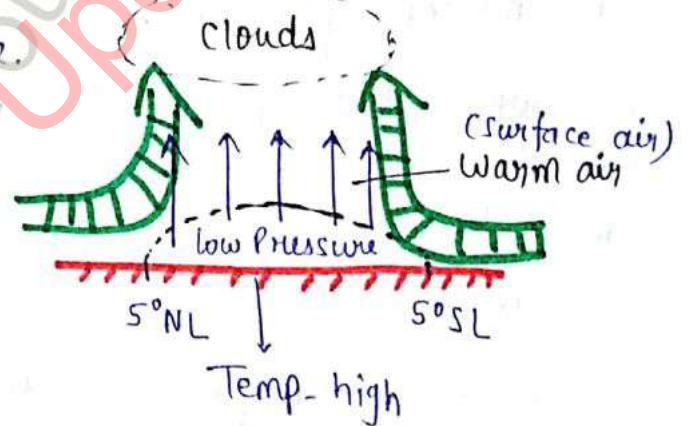
# Climates of India

Tropical and sub-tropical Monsoon climate.

Monsoon type	Season	Sun's location	Winds Direction	Affected areas
1. South-west Monsoon	Summer	Northwards	Sea to land	Indian subcontinent
2. North-east Monsoon	Winter	Southwards	land to sea.	Coromandal Coast of Tamil Nadu

## Pre-Monsoon Rainfall :-

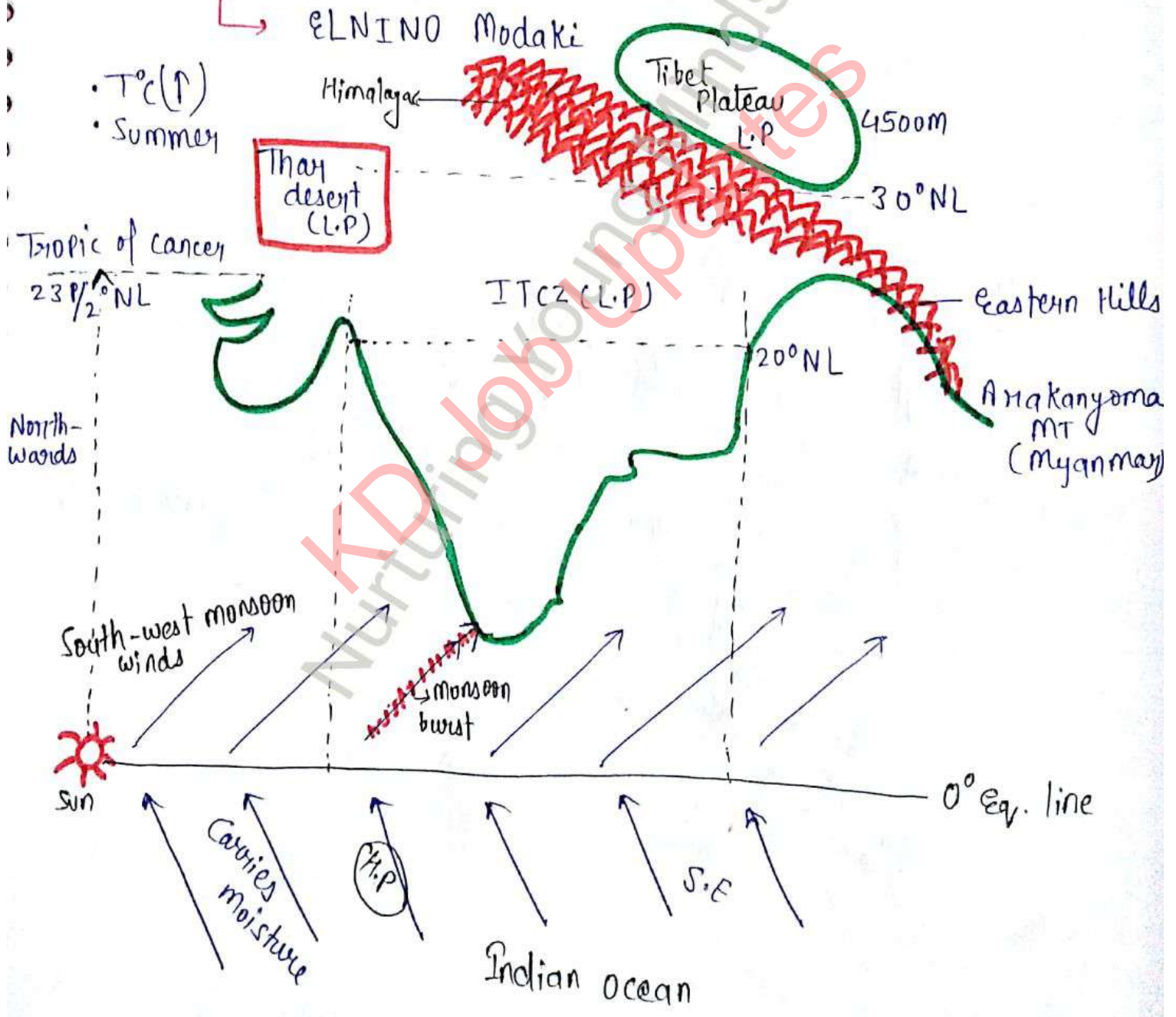
- It occurs due to shifting of ITCZ over mainland of India.
- Inter-tropical convergence zone.



Name	State
1. Mango shower	Kerala
2. Cherry Blossom	Karnataka
3. Coffee shower	
4. Kalbaisakhi	Bengal and Odisha
5. Tea shower	Assam
6. Norwester	North East

# Origin of Monsoon:-

- Shifting of ITCZ over mainland of India (Northwards of sun).
- low pressure at Tibet Plateau, Thar desert and Great Northern plains.
- Hadley cell.
- Impact of Jet stream.
- Effect of ELNINO, LANINA, ENSO and Southern oscillation. (Walker cycle)
- Recent
  - I.O.D = Indian ocean dipole
  - ELNINO Modoki





According to Ferrel's law, when winds cross the  $0^\circ$  equator line from South hemisphere to North hemisphere it turn to their right hand side.

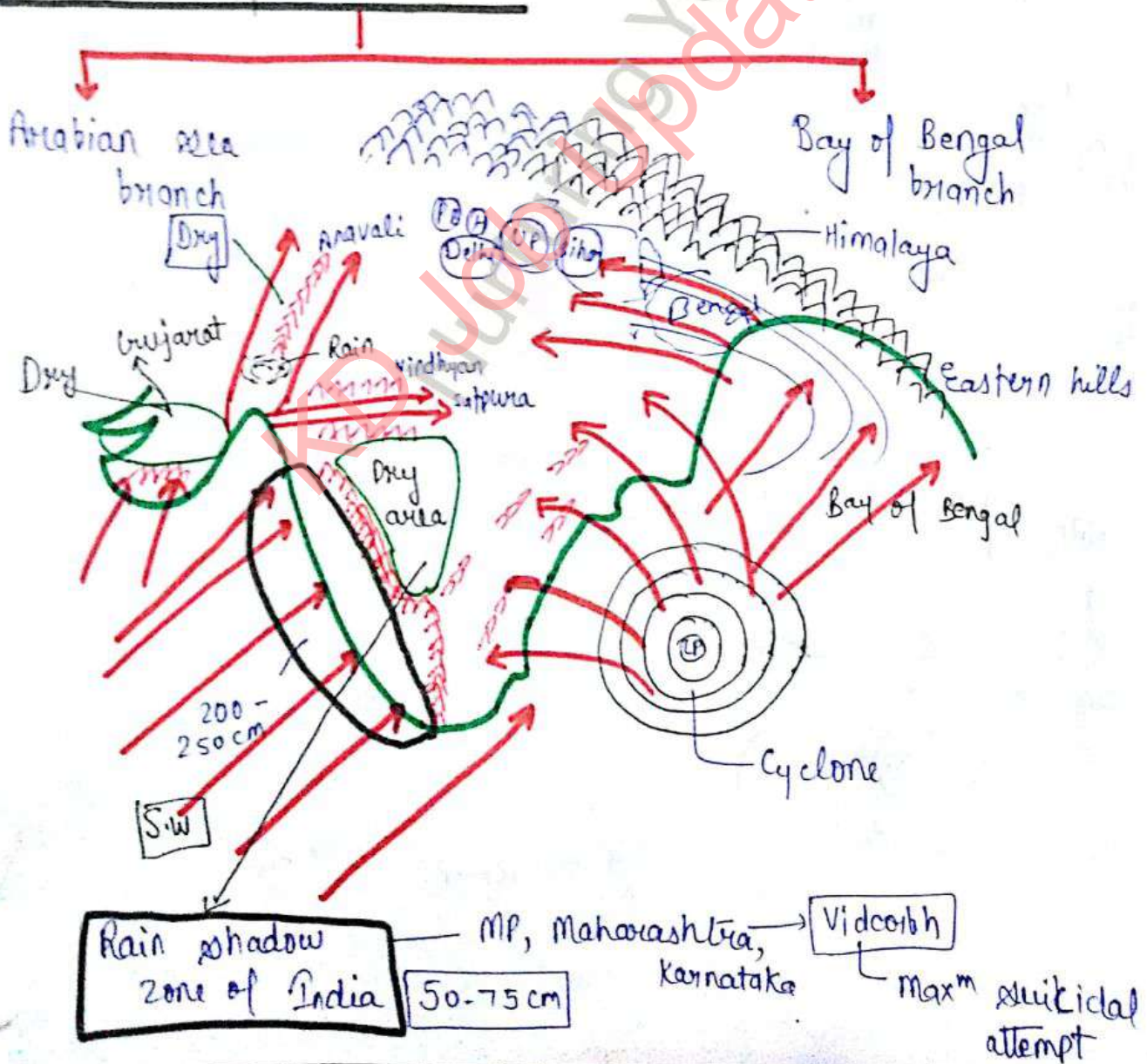
Monsoon Burst :- 1 June, Kerala

When monsoon winds hit first time to the mainland of India; it is called **monsoon burst**.

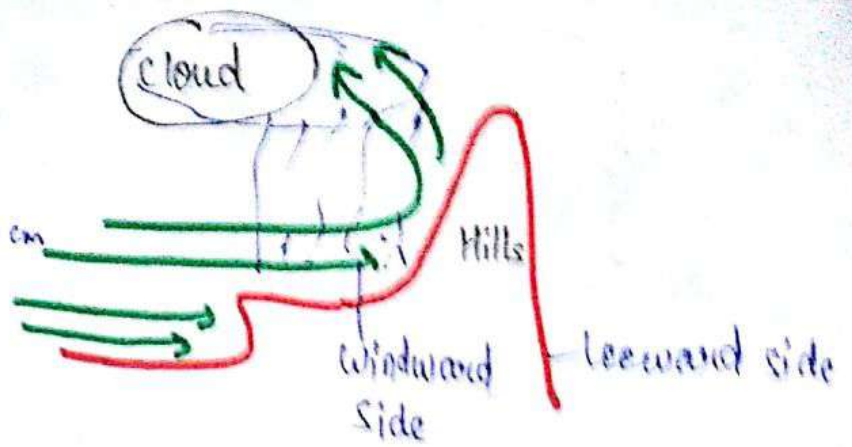
Note-

Monsoon winds hit Andaman and Nicobar 25 May

Mechanism  
Branches of Monsoon :-



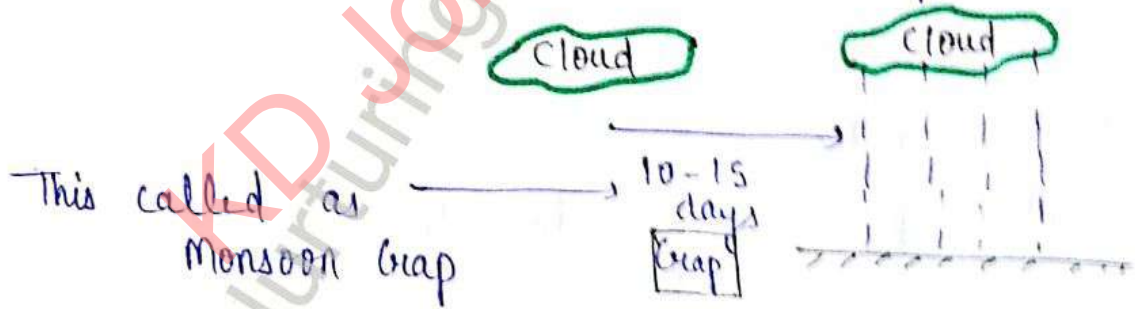
Delhi = 70-90 cm  
 West UP = 100-150 cm  
 East UP and Bihar = 150-200 cm  
 Bengal = 200-250 cm



- Max<sup>m</sup> rainfall of India receives through Bay of Bengal branch
- Rainfall decreases from coastal areas to inland area.
- In summer season Coromandal coast of Tamil Nadu receives less rainfall because hills of eastern ghats are parallel to monsoon winds.
- Western Ghat receives higher rainfall than eastern ghat.

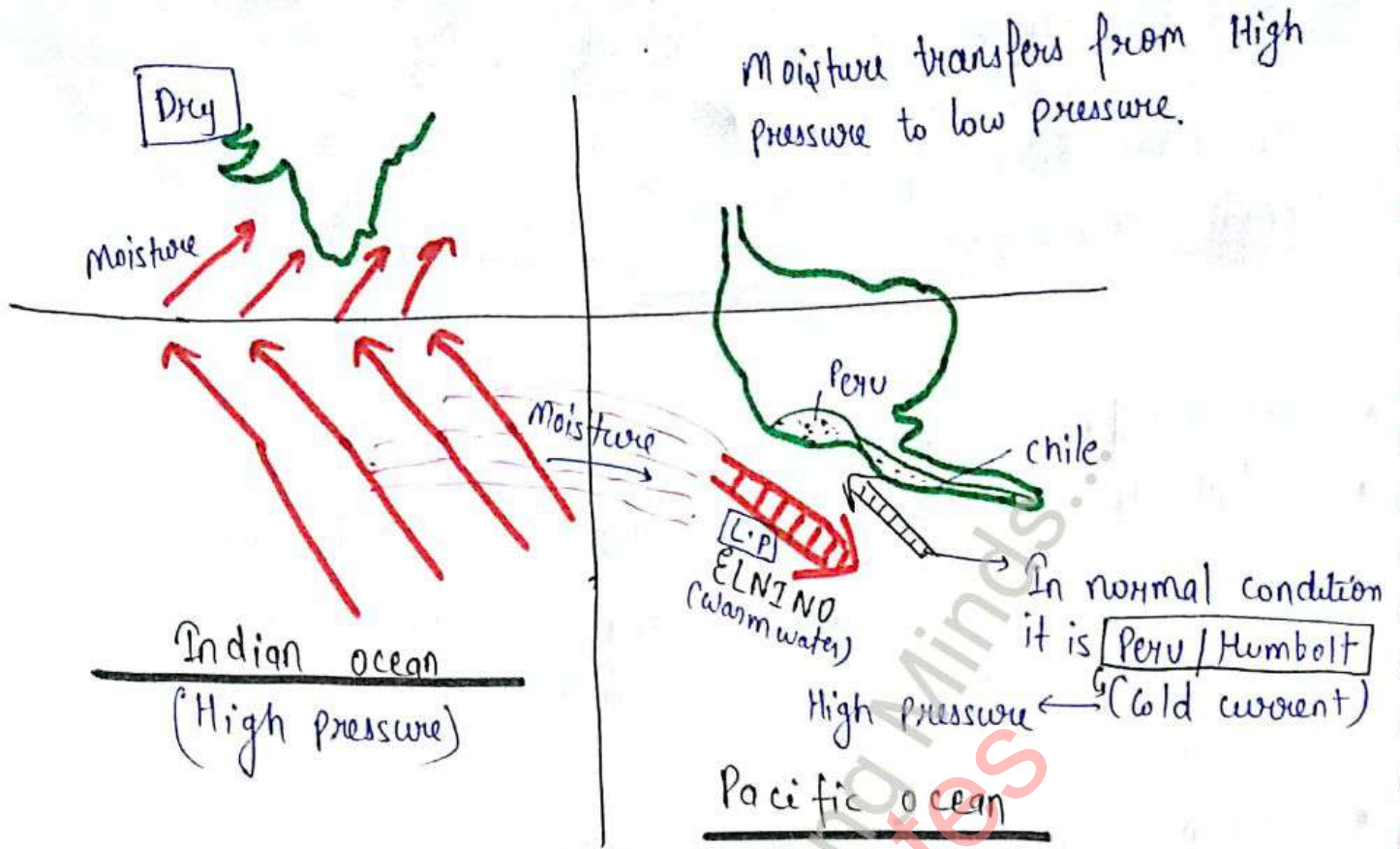
### Monsoon Gap :-

It is a time interval between two monsoon rainfall.



### ELNINO effect:-

- Warm current in Pacific ocean at coast of Peru and Chile.
- Monsoon of India = weak  
 Condition = drought
- It is called 'Christ child'  
 ↳ Because its formation near 25 Dec.



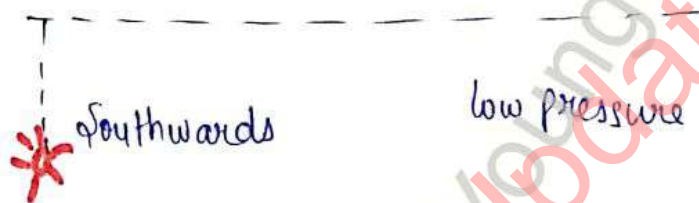
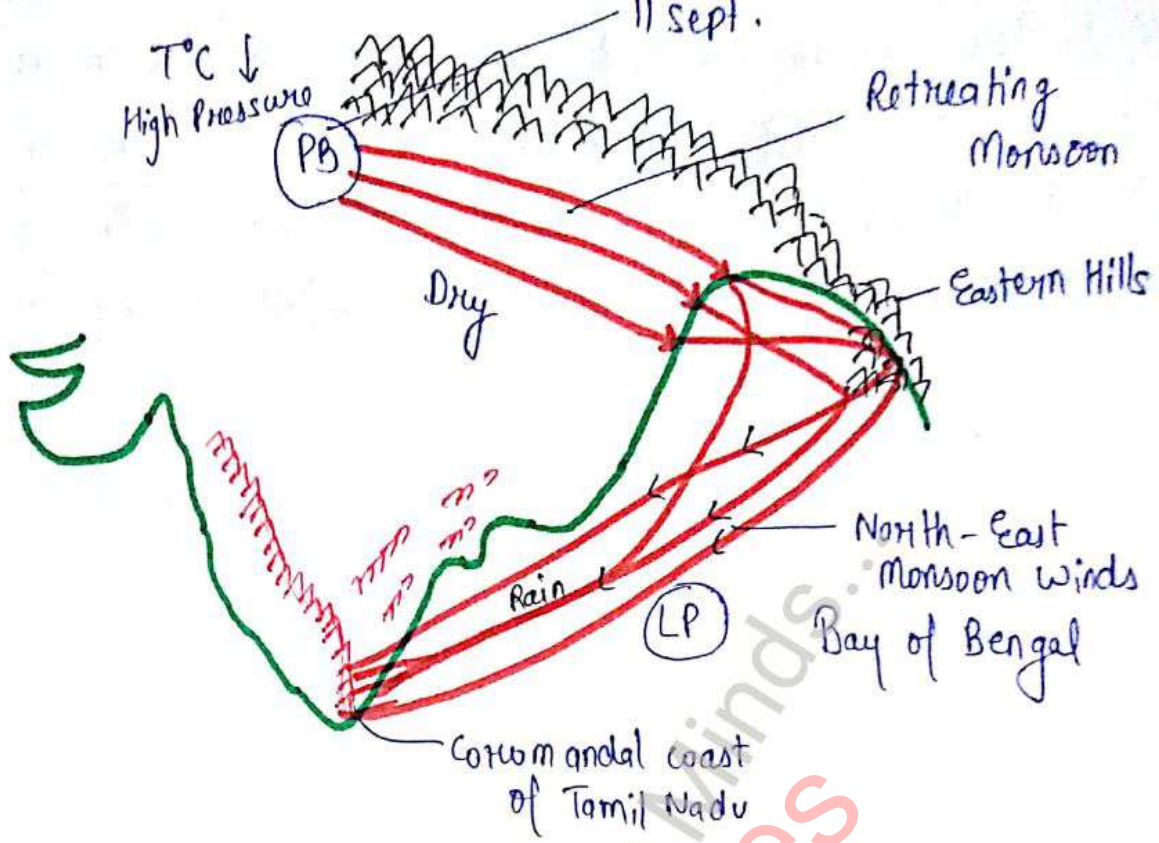
LANINA effect :-

- Cold current in Pacific ocean.
- Monsoon - stronger.
- Condition - Flood.
- It is called as **sister of ELNINO.**

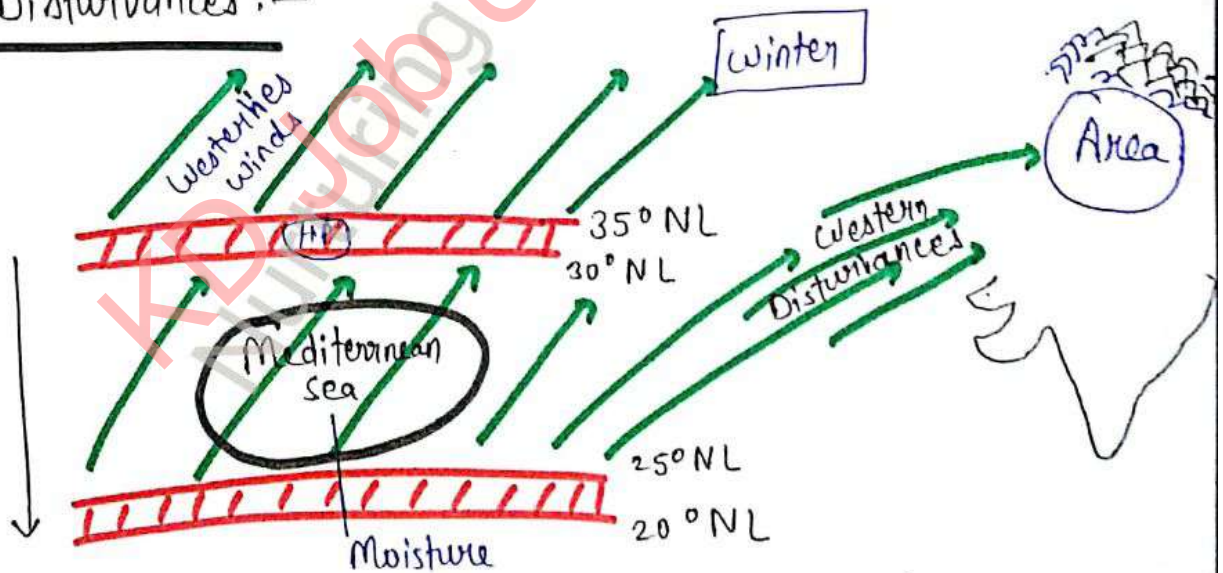
Retreating Monsoon :- मानसून का लौटना / प्रत्यावर्तन -

In winter season rainfall receives on Coromandal coast of Tamil Nadu due to retreating monsoon or north-east monsoon which collects moisture while moving over Bay of Bengal.

North-east Monsoon = Oct - Nov.  
Dec. - Jan - Present



Western Disturbances :-



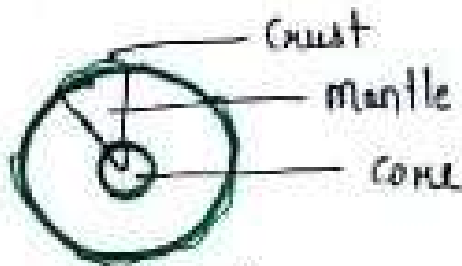
- Area —
1. Punjab
  2. Haryana
  3. Delhi
  4. West UP
  5. North-west Rajasthan

In winter season, rainfall receives in several areas of India due to western disturbances it is a westerlies winds which shifted till  $20^{\circ}$  NL and collects moisture while moving over mediterranean sea and produces rainfall moving further.

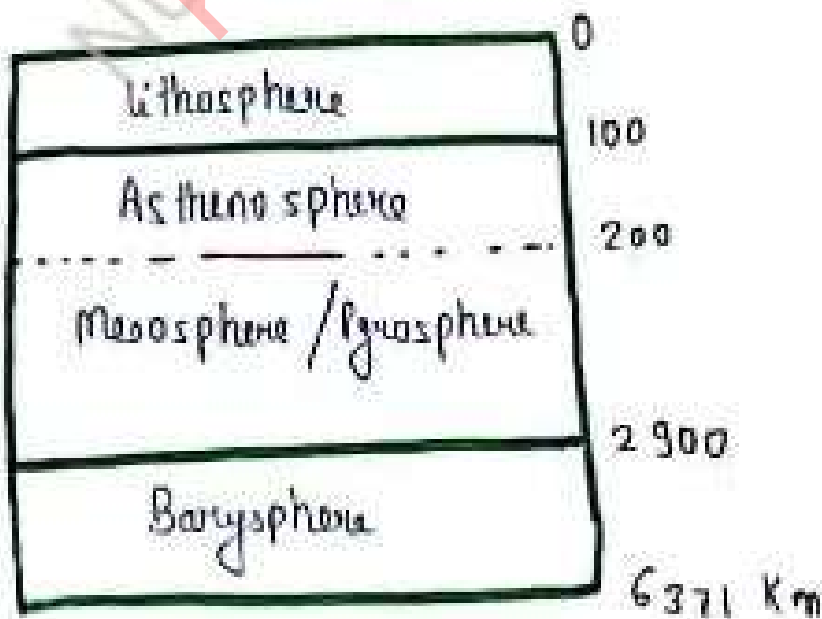
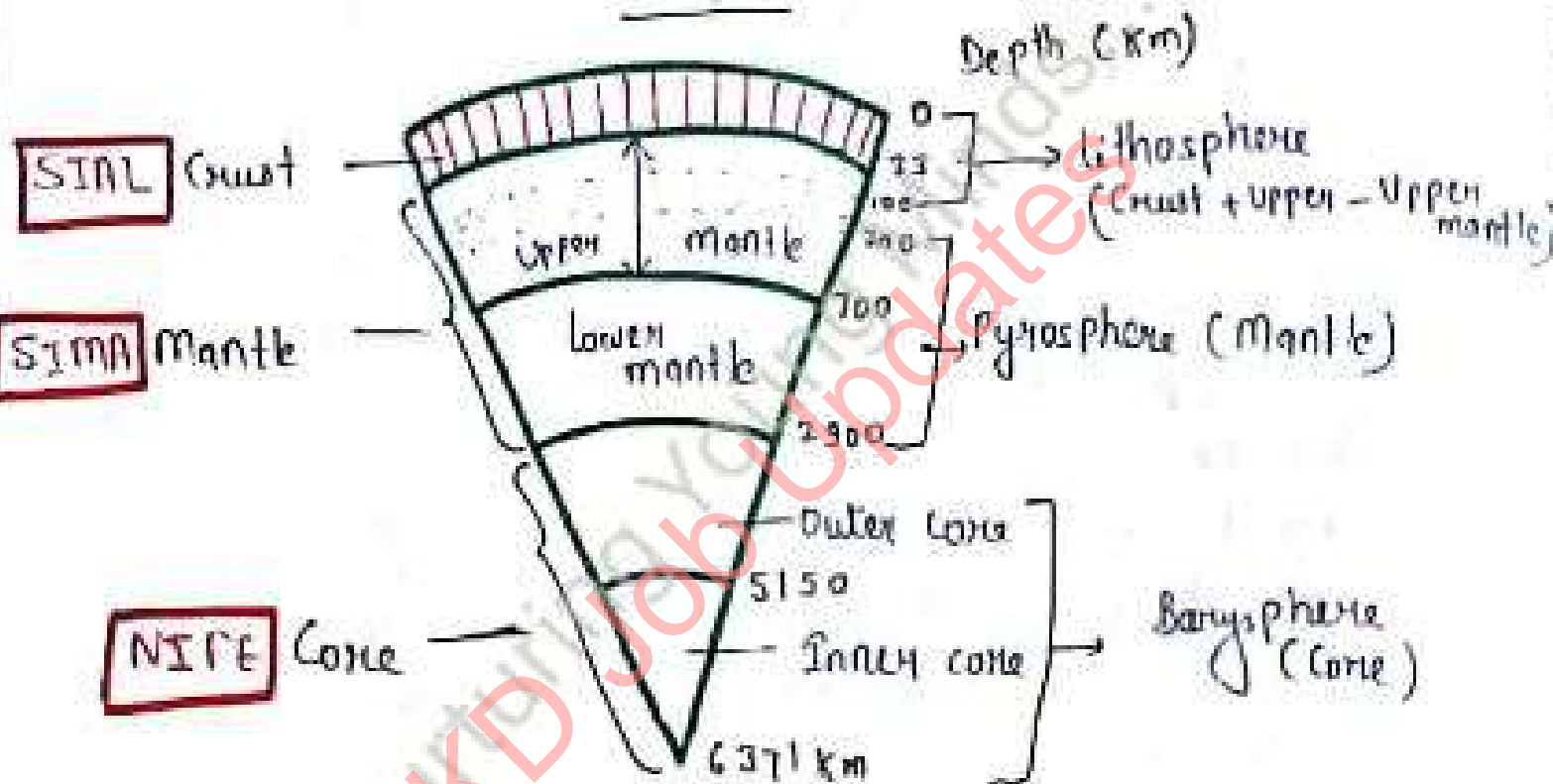
KD Nurturing Young Minds...  
Job Updates

# Geomorphology

## Internal Structure of Earth



Earth

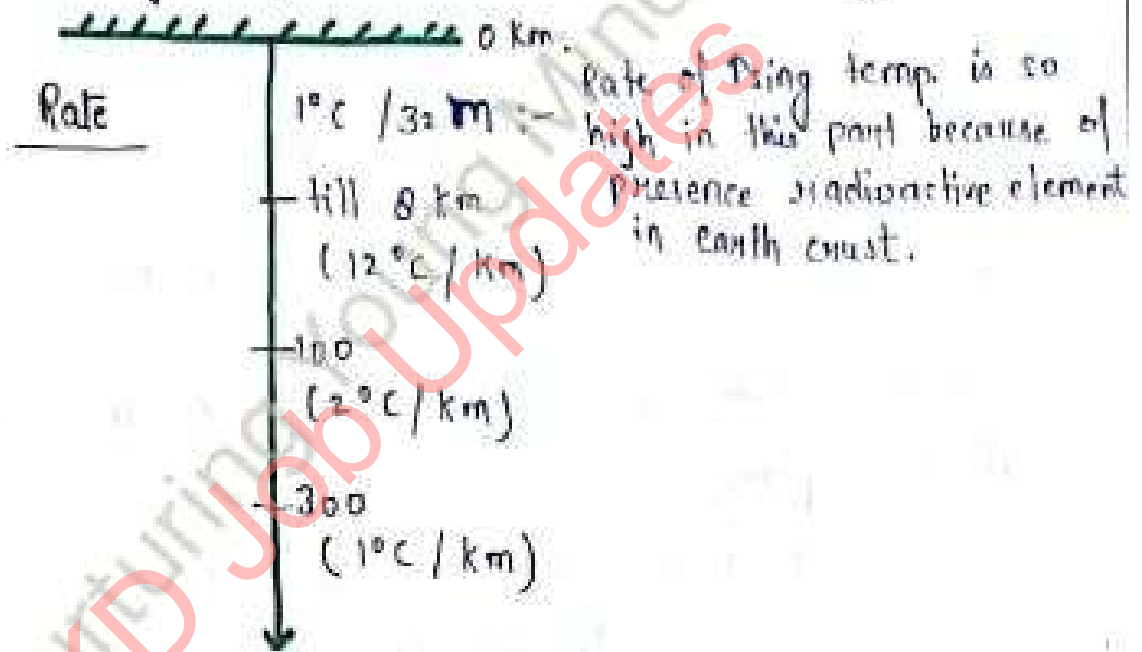


## Elements

	<u>in whole earth</u>
<u>in Crust</u>	
<ul style="list-style-type: none"> <li>• O (max<sup>m</sup>) → 46.6%</li> <li>• Si</li> <li>• Al → Metal (max<sup>m</sup> metal)</li> </ul>	<ul style="list-style-type: none"> <li>• Fe (max<sup>m</sup>) (34.6%)</li> <li>• O</li> <li>• Si</li> <li>• Mg</li> </ul>

↓sing order

- Temperature increases with increasing depth.
- Rate of increasing temp. decreases with increasing depth.



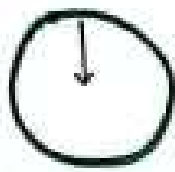
### Crust :-

#### Continental crust

- Thickness = 40-70 km
- It is called 'SIAL' (Si+Al)
- It is made up of Granitic rock.
- Colour - light
- Mass - light
- Density = 2.7 gm/cm<sup>3</sup>

#### Oceanic crust

- Thickness = 10-30 km
- It is called 'SIMA' (Si+Mg)
- It is made up of Basaltic rock.
- Colour = Dark
- Mass = Heavy
- Density = 2.9 gm/cm<sup>3</sup>



- On going inside the earth -
- Density = ↑
  - Pressure = ↑
  - Temp°C = ↑

### Mantle :-

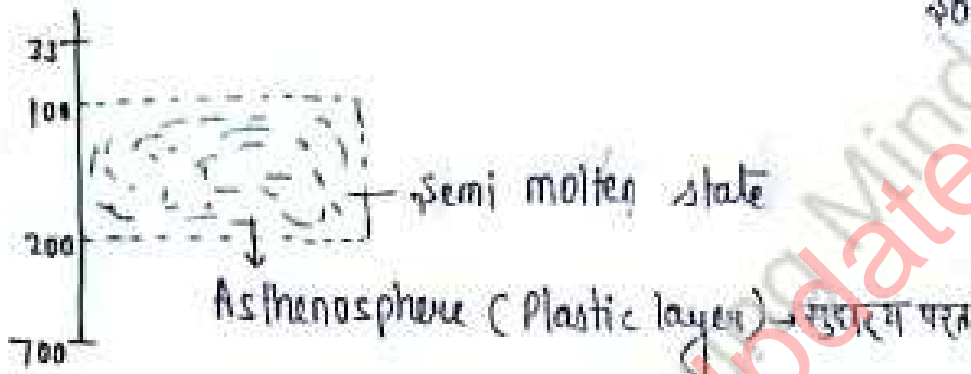
#### Upper mantle

(33 - 700 Km)

#### Lower mantle

(700 - 2900 Km)

↓  
Solid state



Internal structure of earth is based on Seismic waves.

### Asthenosphere :-

- Plates are moving over asthenosphere.
- It is called low velocity zone because seismic waves reduced their speed in this zone.

### Cone :-

It is called 'NIFE' (Ni + Fe)

#### Outer cone

2900 - 5150 Km

Liquid / molten state

#### Inner cone

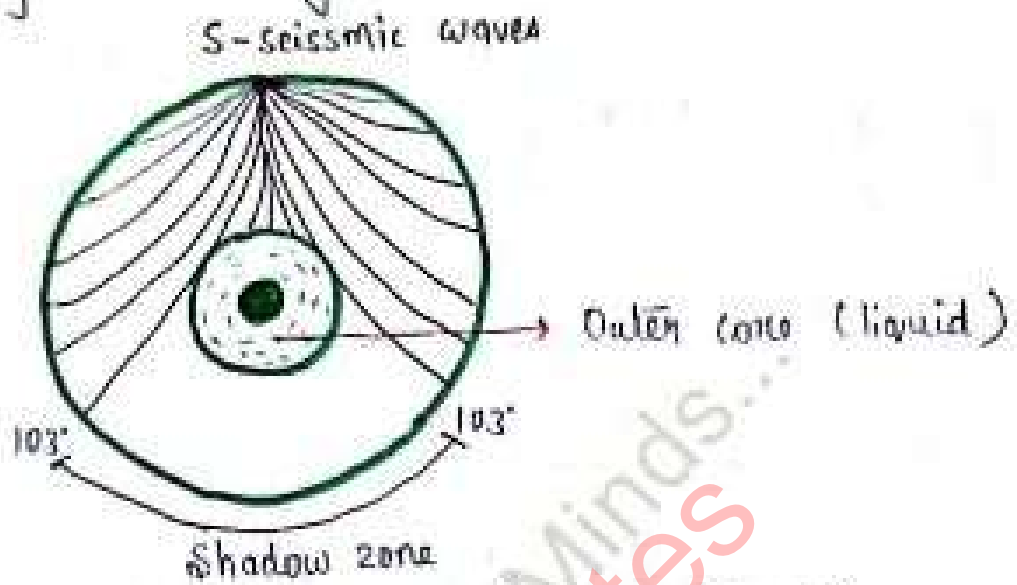
5150 - 6371 Km.

↓  
Solid state



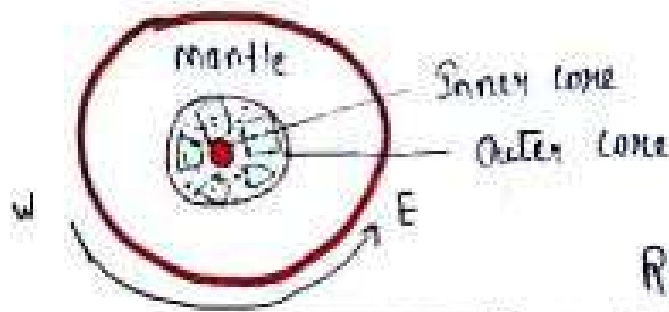
Outer core :-

- S-seismic waves can't propagate through core because it travels through solid only.



Discontinuity zone :- (असंबद्धता / असंततता / असंगतता) -

			<u>Name of scientists</u>
Crust	Continental	CO	→ Conrad
	Oceanic		
Mantle	Upper	Mo	→ Mohorovicic
	Lower		
Core	Upper	Gw	→ Gutenberg - Wiechart
	Inner		
		Le	→ Lehman



Rotation -  
 Core - slowly move  
 mantle - fastly move

Layer	Volume	Mass
Crust	1.1%	0.5%
Mantle	83%	67.5%
Core	14%	32%



Rotation of earth causes friction of convection current.

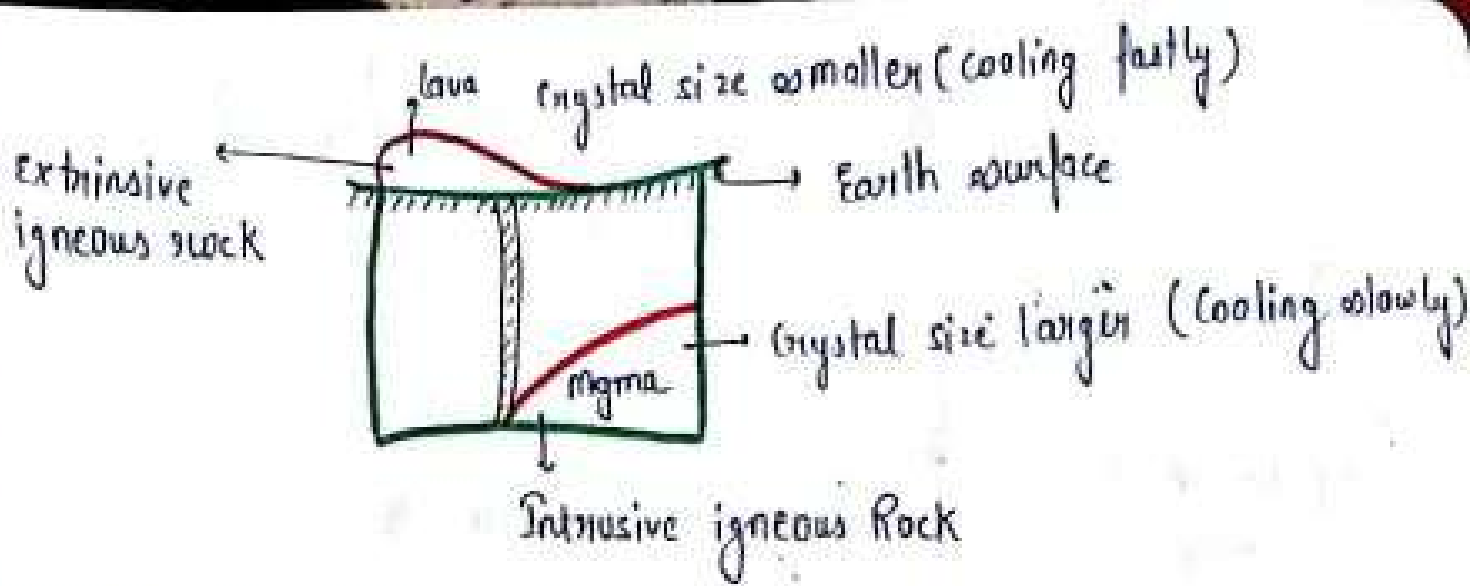
## Rock

It is a solid part of earth crust which contains minerals. Having 3 types of earth crusts -

1. Igneous Rock
2. Sedimentary Rock
3. Metamorphic Rock

### 1. Igneous Rock :-

- It is formed by cooling and solidification process of Magma. This is also called **Magmatic Rock**.



- It doesn't occur in layers.
- It doesn't contain fossils.
- Water doesn't permeate in these rocks.
- It is a crystalline rock.

eg- 1. Granite : \* Maximum proportion of silica.

- \* Color - light
- \* Mass - light

2. Basalt : \* Maximum proportion of ferromagnesium

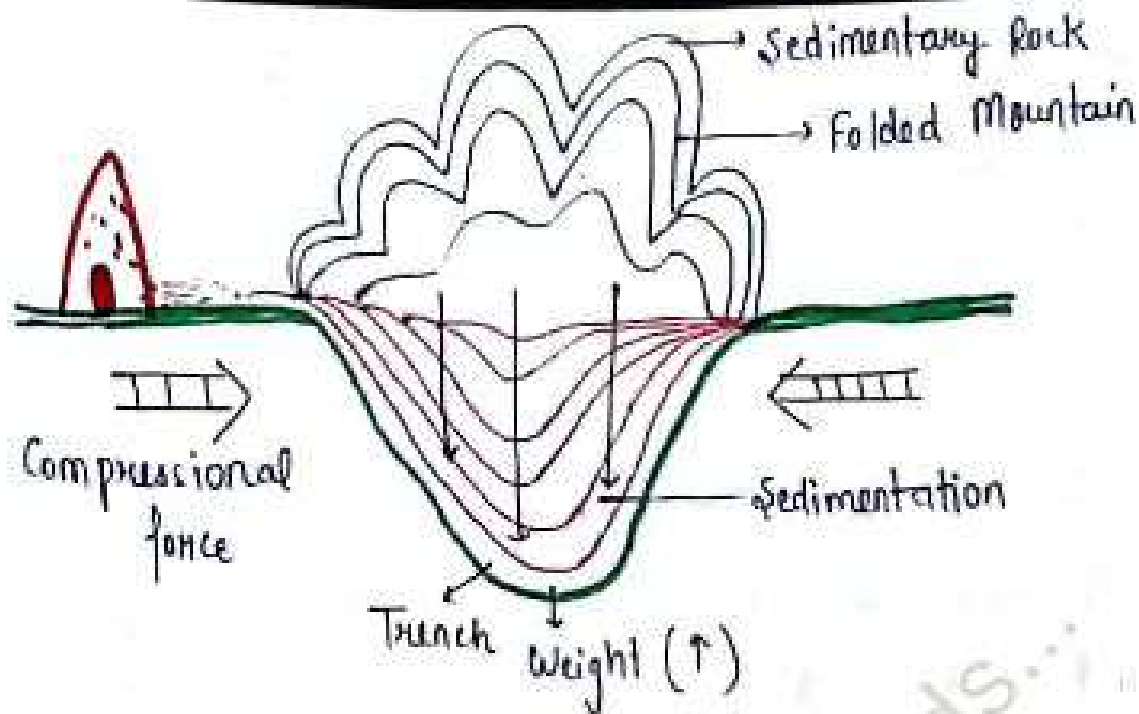
- \* Color - Darker
- \* Mass - Heavier

3. Gabbro

4. Peridotite

2. Sedimentary Rock :-

- It is formed by sedimentation process occurs for long period then after compressional force has actively worked at that place.



- It is a brittle rock.
- It occurs in layers.
- It contains fossils.
- Water, petroleum and Gases are found in these rock.

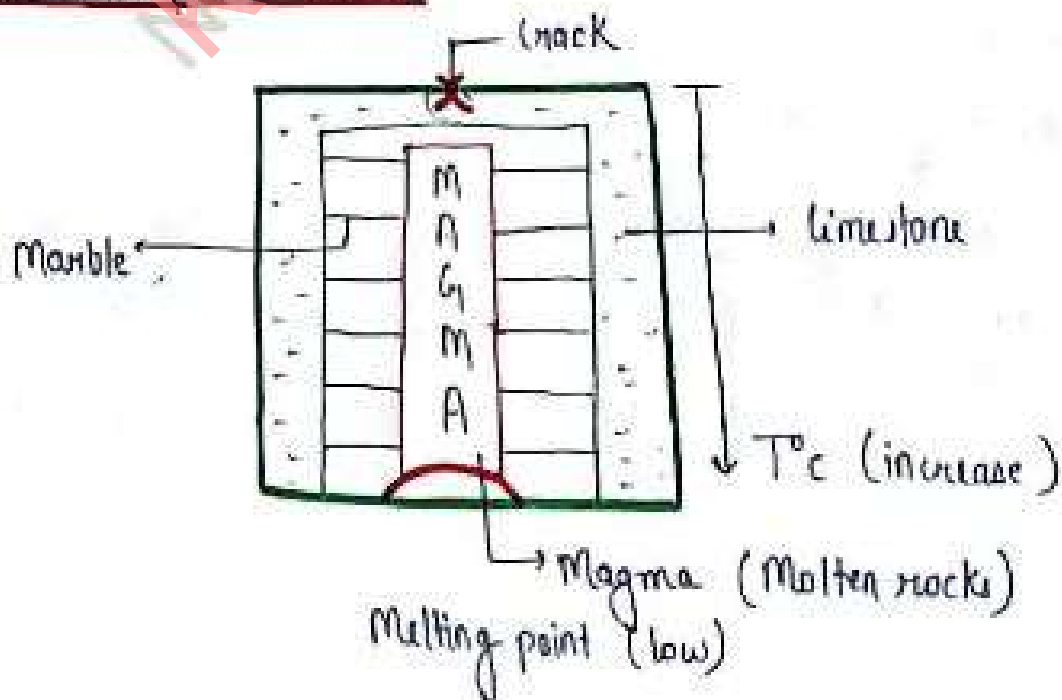
eg- Coal

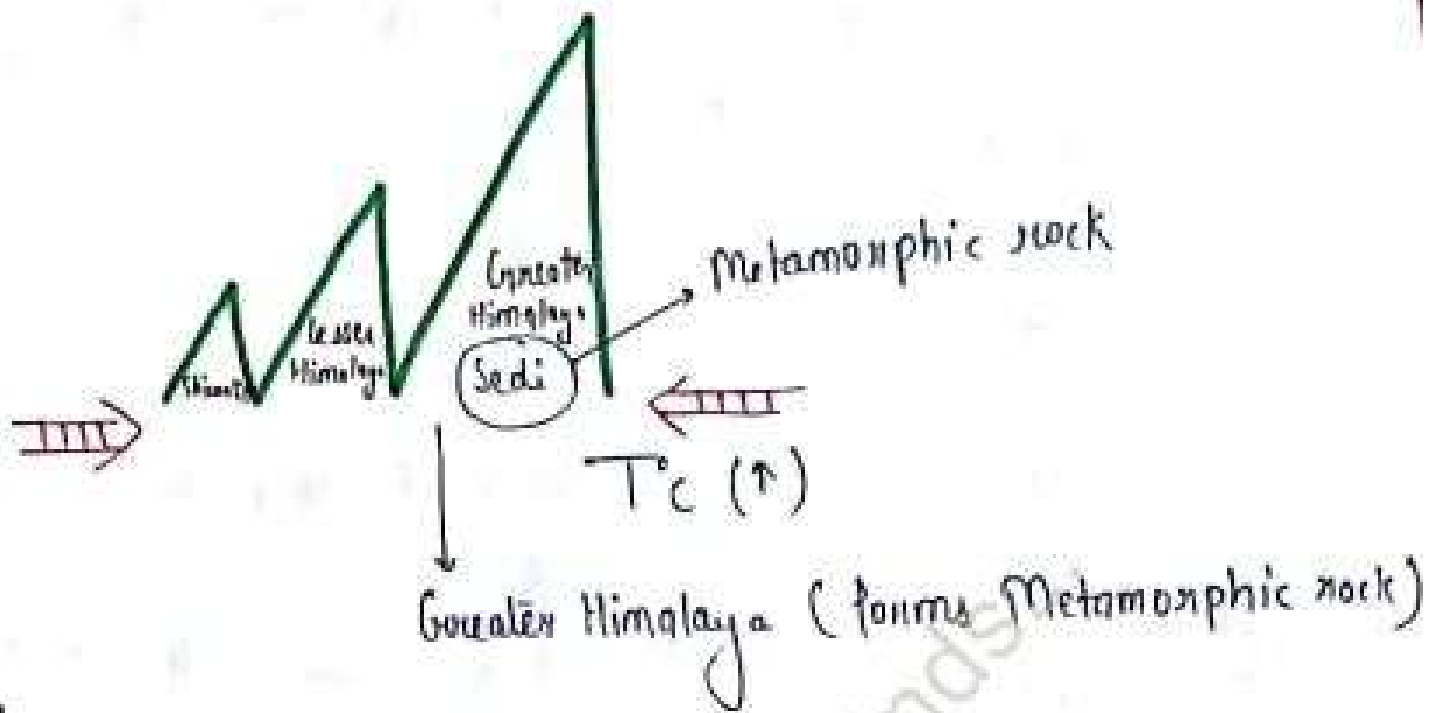
Limestone

Sand stone

Dolomite

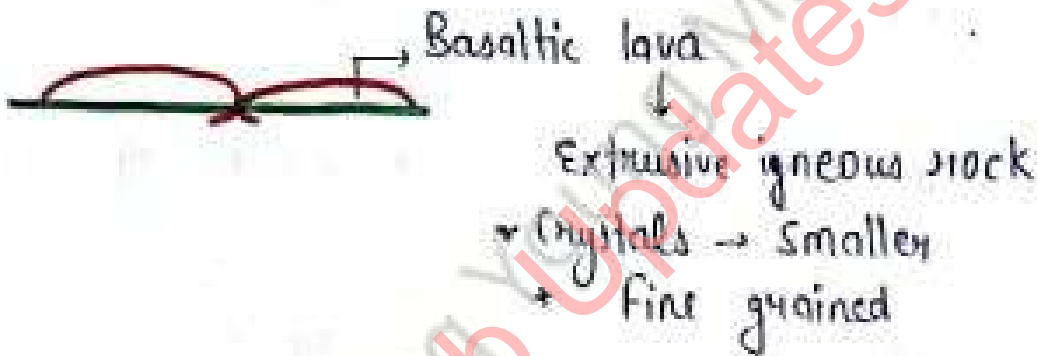
### 3. Metamorphic Rock :-



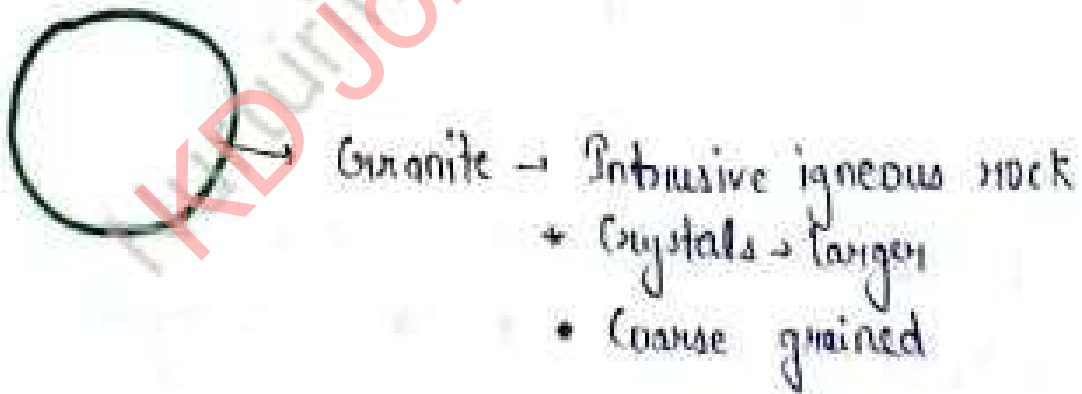


## Note-

1.



2.



- For Metamorphic rock is formed by excessive temperature and pressure actively worked over igneous or sedimentary rock.

Rock	Metamorphic rock (conversion of Rock)
Igneous rock Granite Basalt Gabbro	Gneiss Amphibolite Serpentine
Sedimentary rock Coal Limestone Sand stone Shale	Diamond, Graphite Marble Quartzite → Hardest Rock Slate
Metamorphic rock	Re metamorphic rock (conversion of metamorphic rock)
Slate	Phyllite ↓ Schist

- Fossils are not found in Metamorphic rock.
- Metamorphic rocks are also found in layers.

# Earthquake :-

## Definition :-

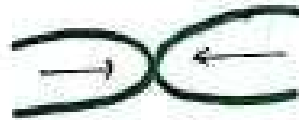
It is a sudden vibrations on earth surface due to plate tectonism.

- 95% earthquake occurs from plate tectonism.

## Plate tectonism :- 3 Types -

### 1. Convergent plate Margin :-

Destructive

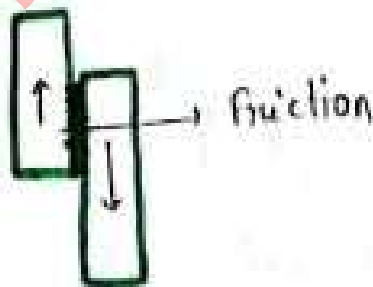


### 2. Divergent plate margin :-

Constructive

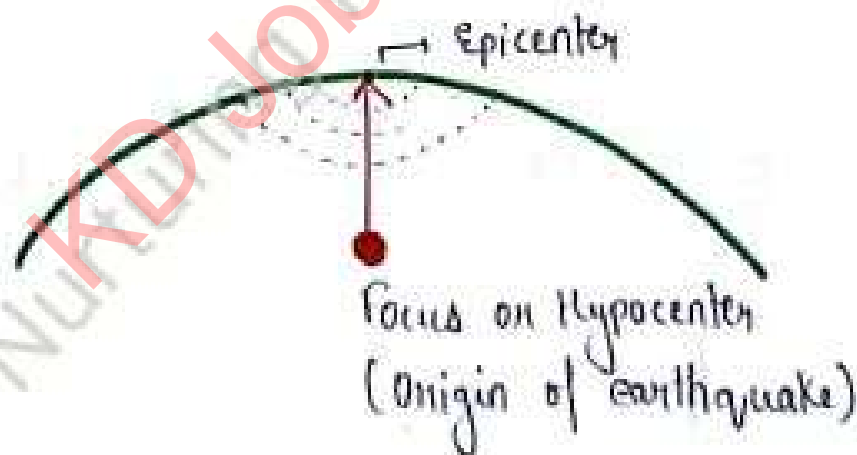
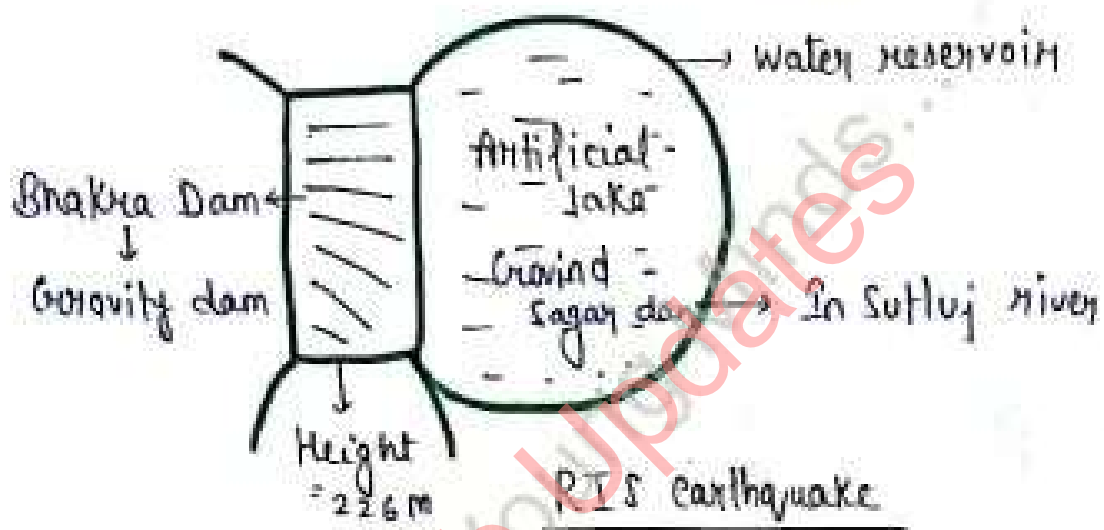


### 3. Transverse plate Margin :-



friction of rocks.

- 5% earthquakes from → Volcanic eruption
- faulting process
- landslide
- Meteorite
- Nuclear explosion
- Mines, Railway Track
- RIS earthquake  
(Reservoir induced Seismic earthquake)



Epicenter :- It is a place on earth surface where seismic waves reached first (just above focus).

\* 'Seismograph' instrument is used to measure earthquake.

↳ Richter scale → To measure intensity of seismic waves.  
(logarithmic scale) → 1-9 scale



- 1
- 2
- 3
- ...
- 7 } 10 times
- 6 } 10 times
- 5 } 10 times
- 4 } 10 times
- 3 } 10 times
- 2 } 10 times
- 1 } 10 times

Seismic zone of India :- In present 4 zone.

1. **V zone**
  - Himalaya
  - Eastern hills
  - Bhuj and Latur (Gujarat)
  - Latur (Maharashtra)

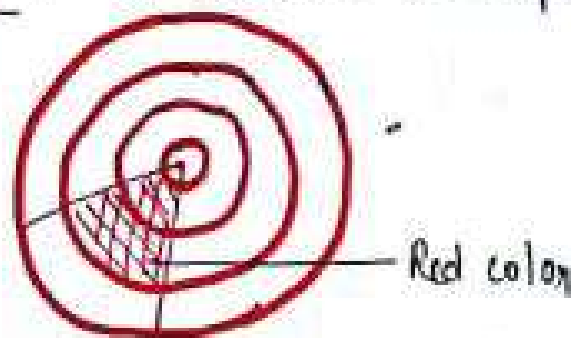
8-9 scale
2. **IV zone**
  - Delhi

7-8 scale
3. **III zone**
  - Allahabad
  - Jaipur
  - Varanasi

5-6 scale
4. **II or I zone**
  - South India

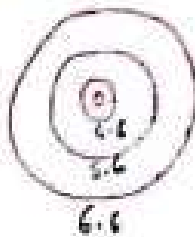
3-4 scale

Mercalli scale :- It measure the amplitude of seismic waves.



## Iso seismal line :-

It is a line which passes through different places which having same intensity of seismic waves.



## Homo seismal line :-

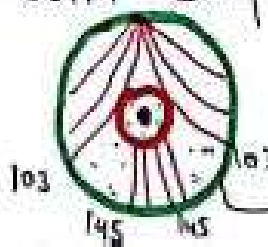


It is a curved line passes through different places which having same arrival of seismic waves.

## Seismic waves :-



P-waves :- It is a primary waves  
\* It reached first at earth surface due to maximum speed.



Shadow zone (from 103-145)

- Max<sup>m</sup> speed = 3-14 km/sec.
- It moves like longitudinal waves on sound waves.
- It is a parallel waves.



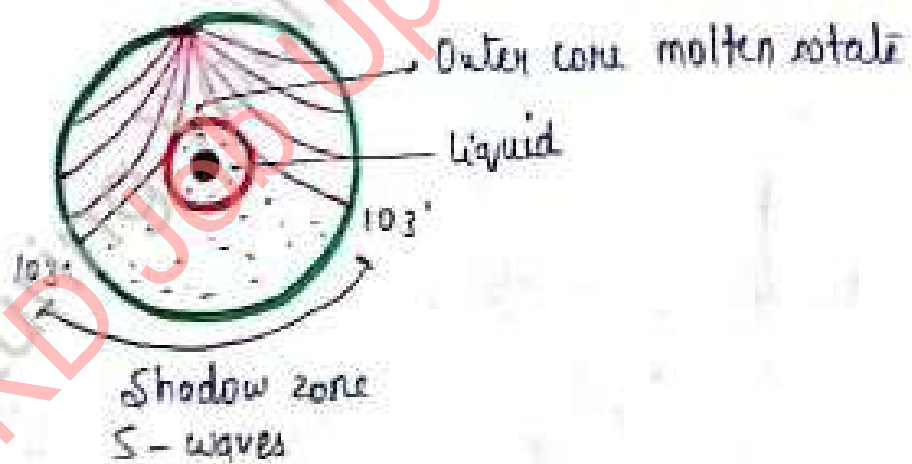
- It can travel through solids, liquids and gases.

### P-waves :-

- It is secondary waves.
- It moves like transverse waves on light waves.
- It is perpendicular waves.



- P-waves only travel through solids, cannot propagate through core.



- Speed = 7-9 km/sec.

### L-waves :-

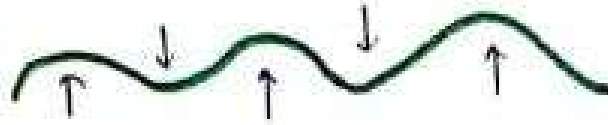
- It is long waves
- It is only found on surface, called surface waves.
- It can travel through solids, liquids and gases.

\* Speed - 1-3 km/sec.

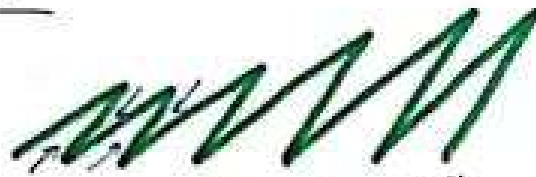
\* Most destructive seismic waves.

2 Types :-

1. Rayleigh waves -



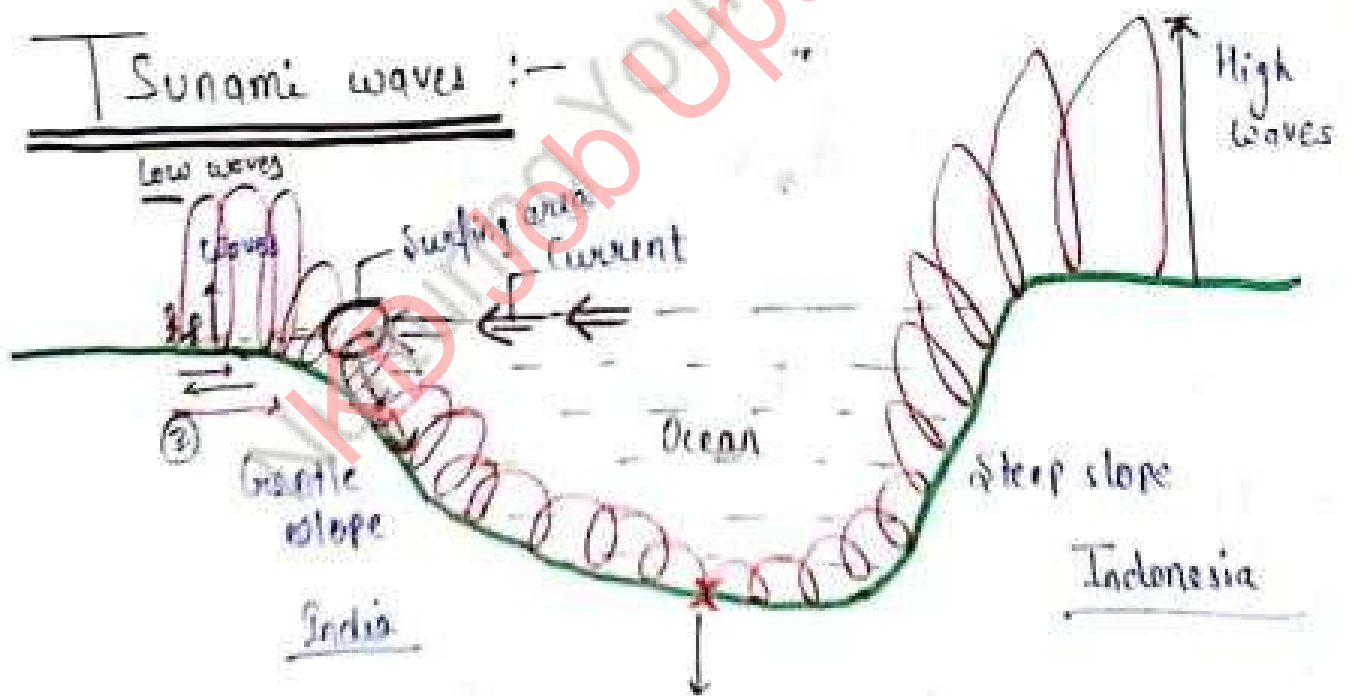
2. Love waves -



Zig-zag path

Most destructive seismic waves.

Tsunami waves :-



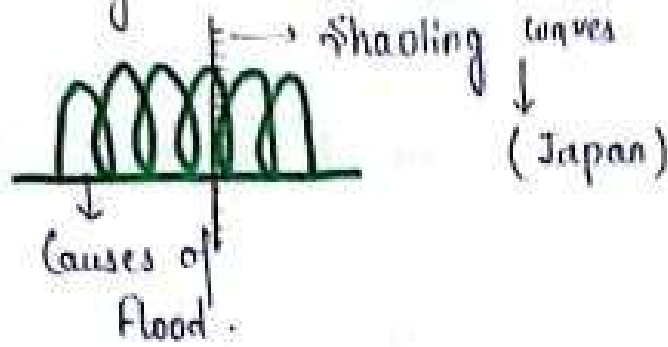
1. Origin :- Submarine earthquake

2. Waves - It is under sea waves.

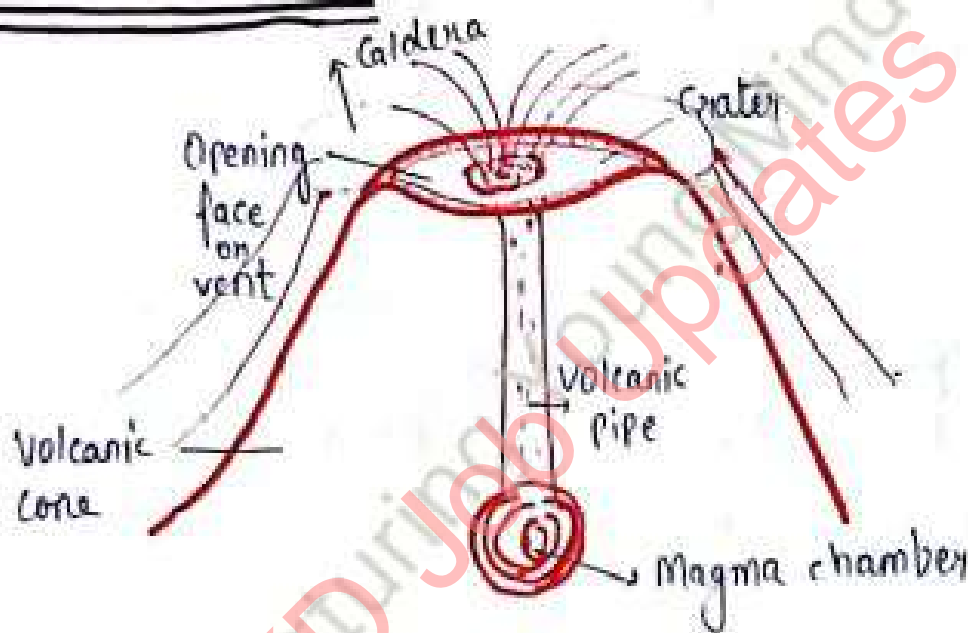
3. Indications - Backwards of ocean water

4. Height of waves - Depends on nature of slopes.

- Indian government made Tsunami alert system in Hyderabad.



## Volcano :-



### Definition -

It is an opening face on vent by which heated materials are erupted from interior of the earth.

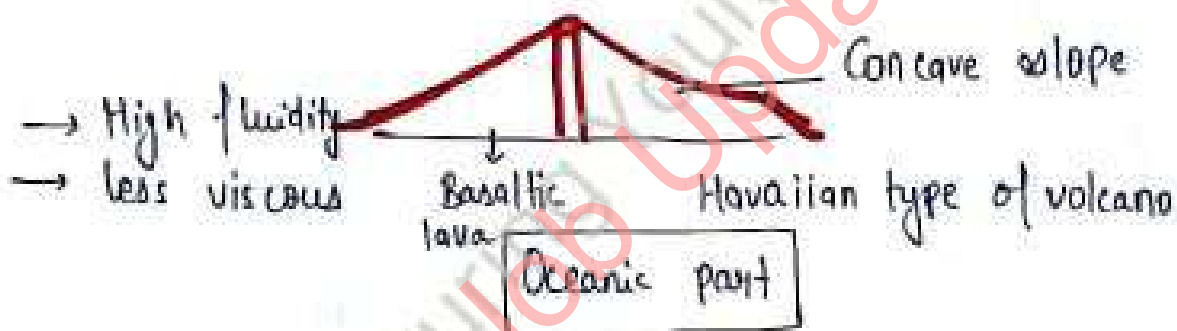
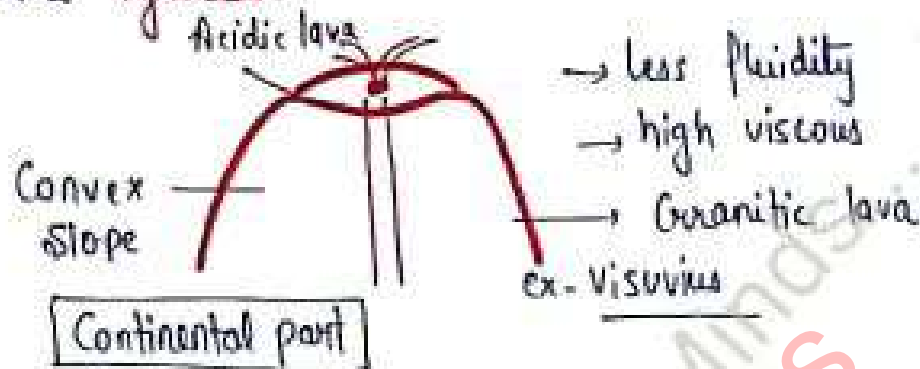
- Heated materials -  
Lava → Acidic - Max<sup>m</sup> proportion of silica  
→ Basic - Min<sup>m</sup> proportion of silica

Decreasing order of silica -

Felsic  
↓  
Mafic  
↓  
Ultra mafic

- Water vapour - 60-90% of total eruption (max<sup>m</sup>)
- Gases -  $SO_2$ ,  $N_2O$ ,  $CO$
- Rock fragments → Tuff → Ashes (max<sup>m</sup>)  
→ Lapilli

3rd Pyroclast :- All types of rock materials are combinedly called a Pyroclast.



Caldera :- larger size of crater is called Caldera.

Types of Volcano :-

1. Active volcano -

Those volcanoes who erupts frequently are called active volcano.

Note - Barren Island - Middle Andaman (India)

Volcano	Place
ex- 1. Mono loa 2. Monakea 3. Kilauea	Hawaiian Island (50 <sup>th</sup> state of USA) called 'Xing' of Pacific ocean.

Xing = Crossing

Kilauea → • Most active volcano.  
 • Largest Caldera.

Monakea →

If we measure from height from deep sea plains; height mountain of world is Monakea. (9,500m)



Volcano	Place
ex- 4. MT. Etna 5. MT. Stromboli ↓ light house of Mediterranean sea	Sicily Island (Italy)
6. M.T. Erabus (Only active volcano of Antarctica)	Antarctica
7. CotoPaxi (5800m) (Highest active volcano of the world)	Ecuador (Capital - Quito) South America

Note- Ojos-del Salado - In Chile-Argentina border.  
(6800m)

8. MT. Tal

9. MT. Mayon

10. MT. Pinatub

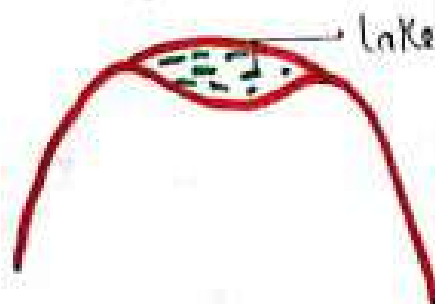
Philippines

## 2. Dormant Volcano:-

Those volcanoes who hasn't erupted for long period but a possibility of eruption in near future are called dormant volcano.

Volcano	Place
1. Visuvius	Italy
2. Narcondum Island	Andaman and Nicobar
3. Krakatao	Indonesia
4. Fujiyama	Japan

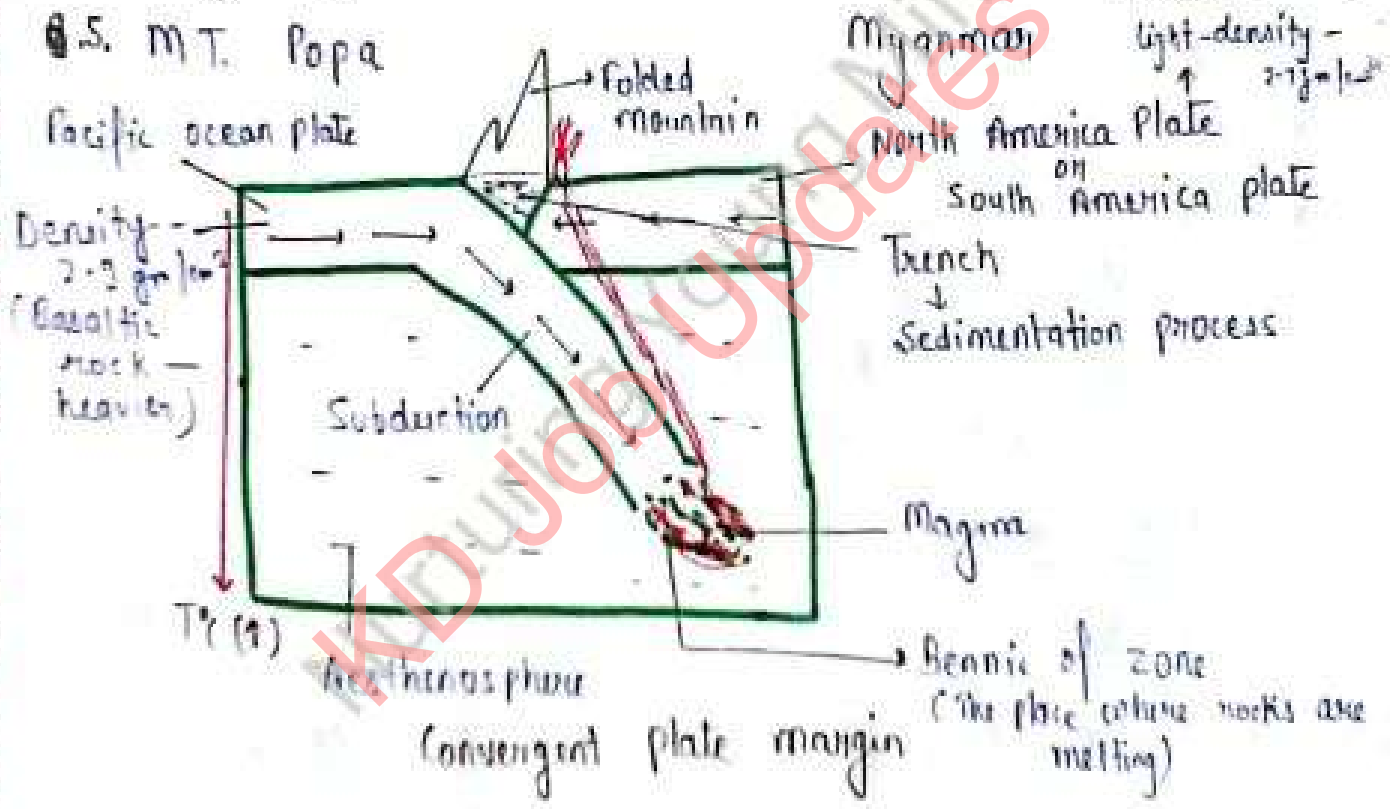
3. Extinct Volcano:- Those volcanoes who doesn't possess any sign of eruption in near future are called extinct volcano.



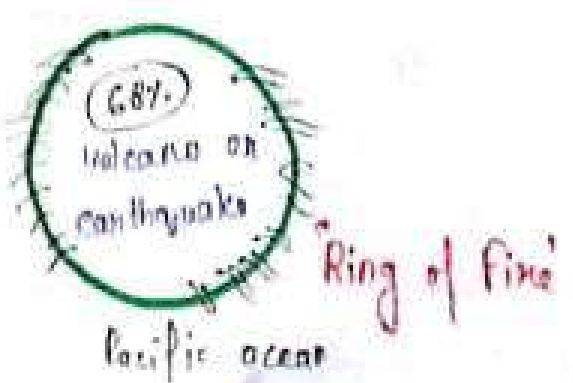


1. Aconcagua (6900m)	Argentina (South America)
2. Kilimanjaro	Tanzania
3. Chimborazo	Ecuador
4. Koh Sultan Deoband	Iran

Note - Aconcagua - Highest volcanic mountain of the world, after Himalaya highest mountain of the world.

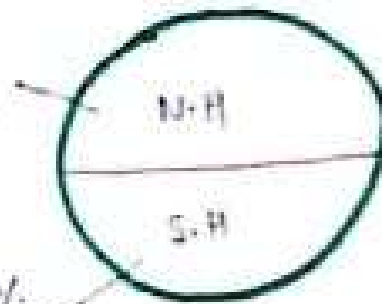


68% volcano and earthquakes of the world are found around Pacific ocean, this phenomenon is called 'Pacific Ring of fire'.



# Oceanography

Land - 40%  
Water - 60%



Land - 20%  
Water - 80%

On earth:-

Land - 29.2%  
Water - 70.8%

## 100% water consist-

- 97% - Ocean
- 2% - Glaciers
- 1%
  - Rivers
  - Lakes
  - Ground water
  - Moisture

## Ocean Relief:-

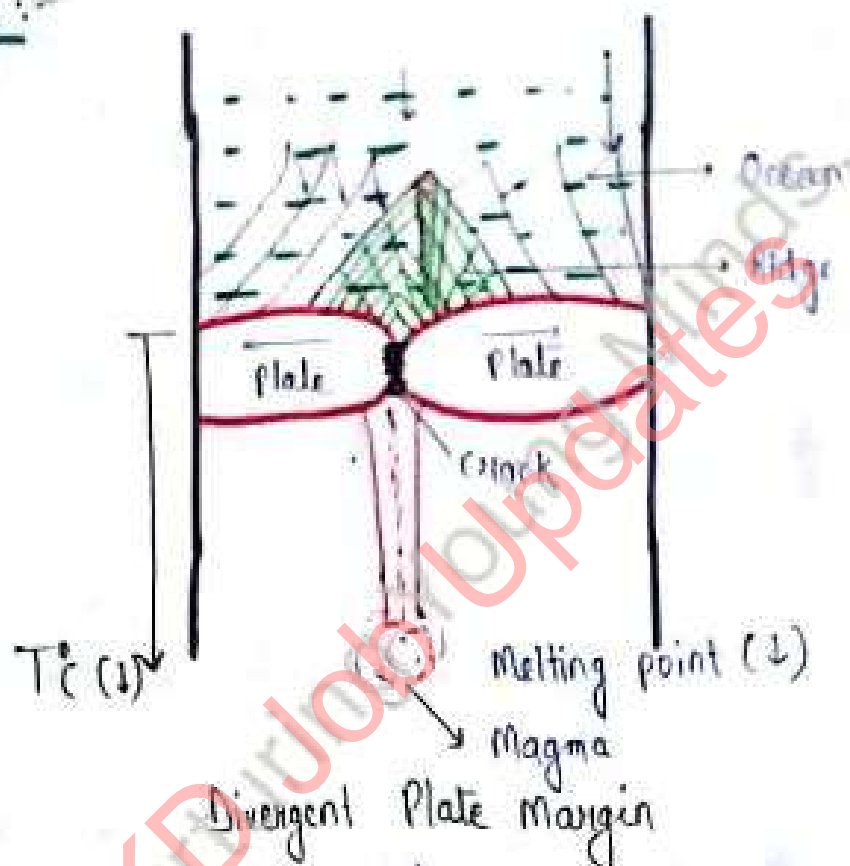
### 1. Trench :-

It is a deepest part of ocean, are called trench.

Trench	Ocean
1. Mariana or Challenger Depth - 11,033 m	North Pacific ocean (Near by Philippines)
2. Tonga	South Pacific ocean

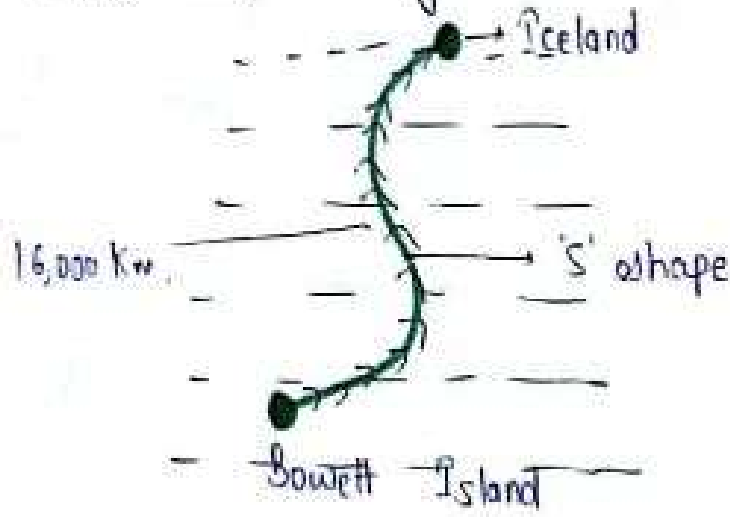
3. Puerto Rico	North Atlantic Ocean
4. Romeike	South Atlantic Ocean
5. Sunda / Java (Deepest trench of Indian Ocean)	Indian Ocean

2. Ridge:-

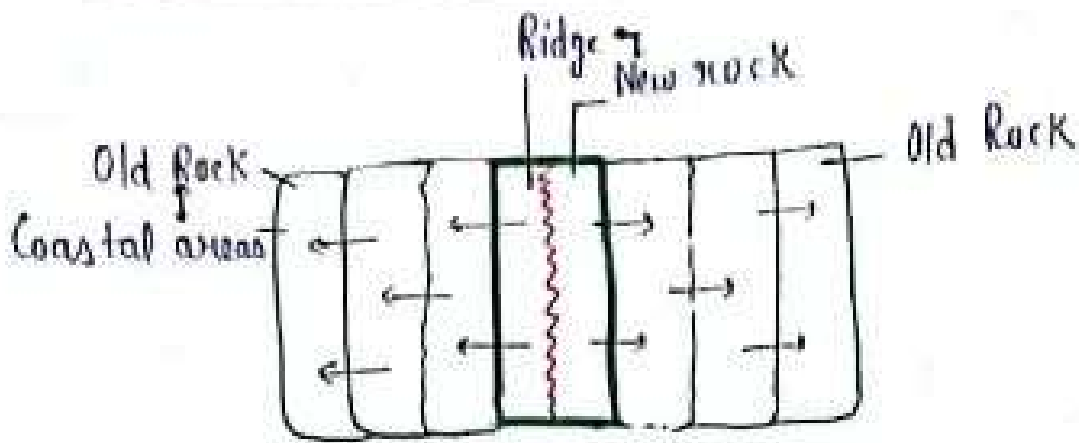


• Ridge is a raised areas of ocean.

eg- 1. Mid Atlantic Ridge → shape 'S' shape



longest rocky's Range of the world.



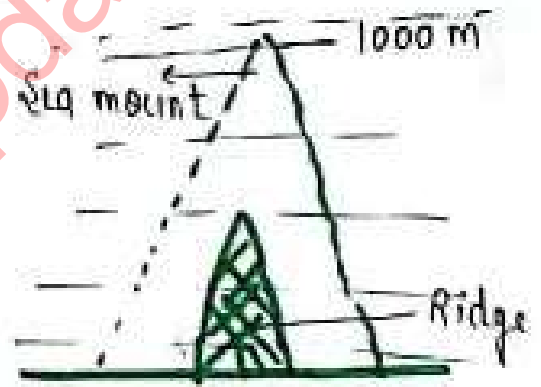
### Sea floor Spreading

- 'Sea floor spreading' concept was given by Henry Heiss.
- Plate tectonism theory also given by Henry Heiss.

eg (2) 90° East Ridge - Indian ocean

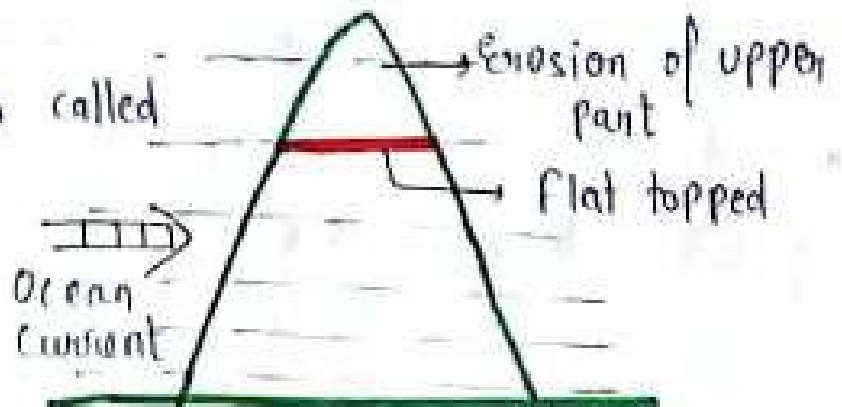
### 3. Sea mount :-

- 1,000 m height of ridge are called sea mount.

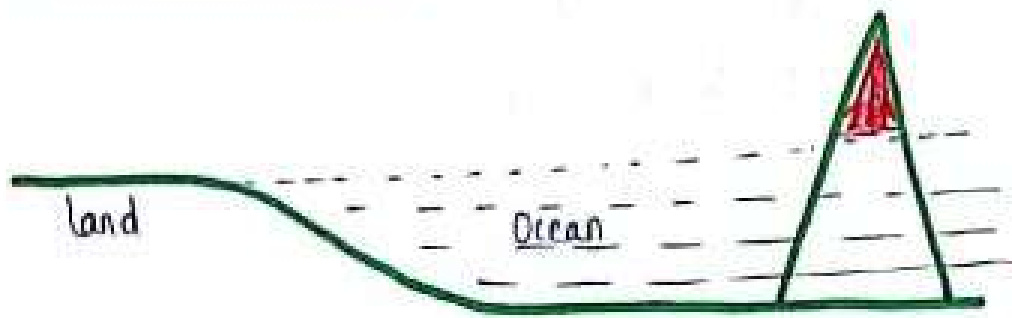


### 4. Guyot :-

Flat topped sea mount is called Guyot.



## 5. Volcanic Island :-



- If sea mount raised above sea level, it is called volcanic island.
- Max<sup>m</sup> volcanic islands are found in Pacific ocean.

## Ocean (Area wise) :-

1. Pacific ocean
  2. Atlantic ocean
  3. Indian ocean
  4. Arctic ocean
- 
5. Southern ocean or Antarctic ocean.

## Ocean (Depth wise) :-

- Pacific → deepest
- Indian
- Atlantic
- Arctic

## Ocean salinity :-

Percentage of salt dissolved in 1,000 gm of fresh water.

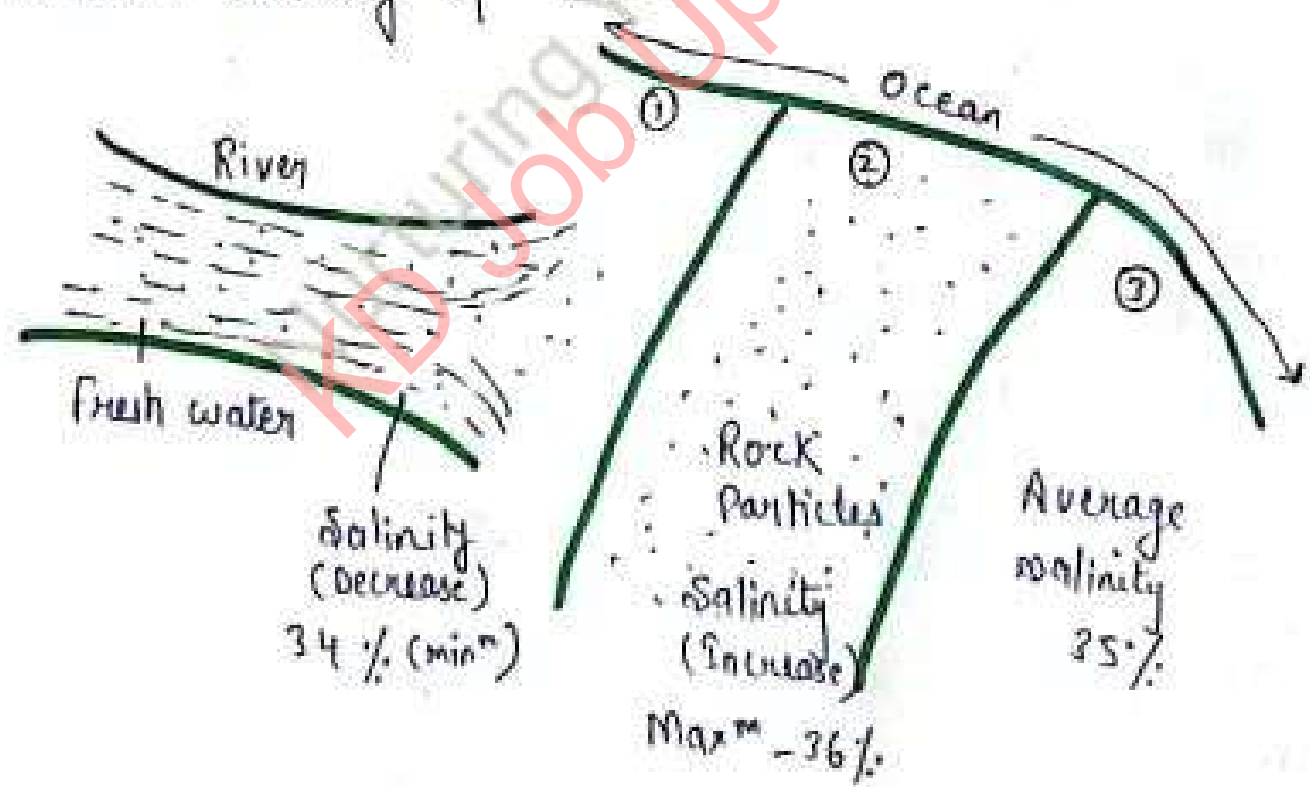
Average salinity :- 35‰  
i.e., 35 gm of salt dissolved  
in 1000 gm of fresh water

(‰ - In 1000 gm)

Salt :-

- NaCl
  - MgCl<sub>2</sub>
  - MgSO<sub>4</sub>
  - CaSO<sub>4</sub>
- Decreasing order

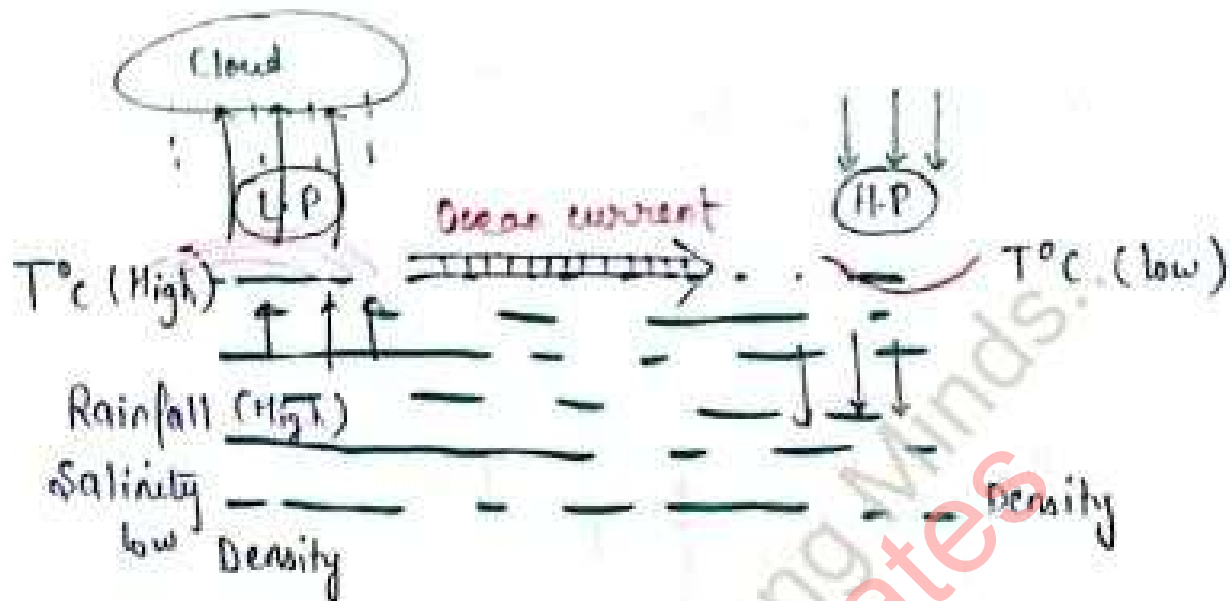
- Max<sup>m</sup> salinity is found in Atlantic ocean because of maximum breaking of rocks.



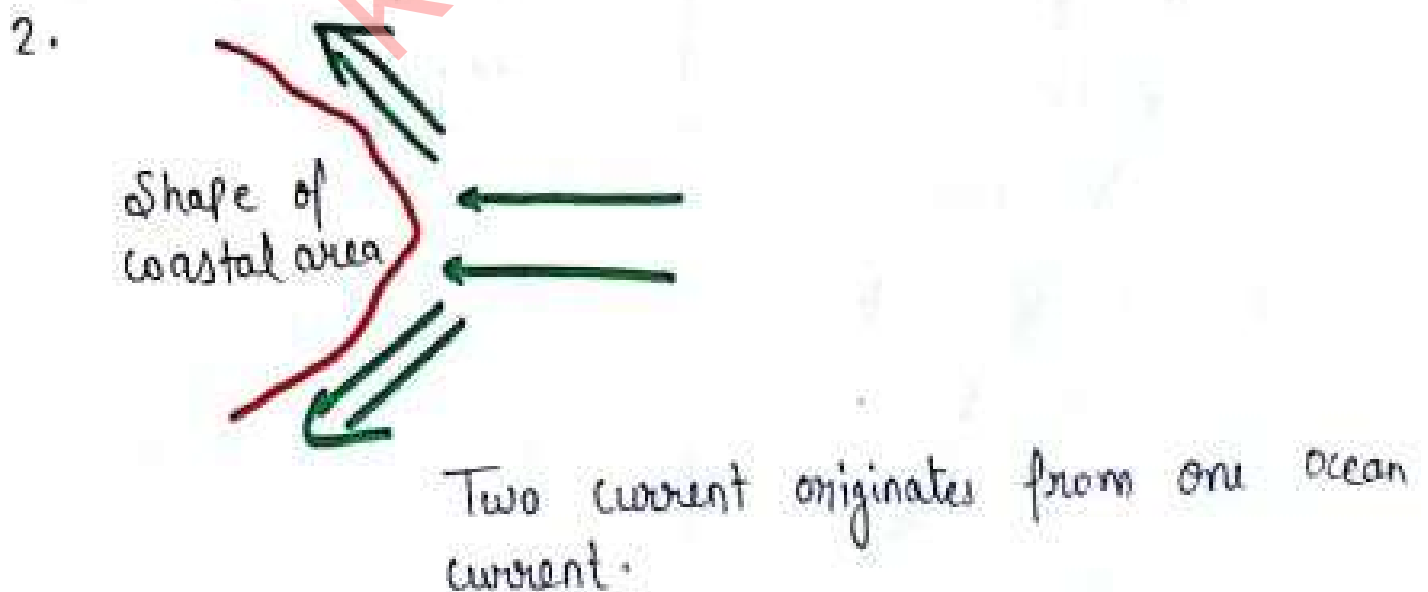
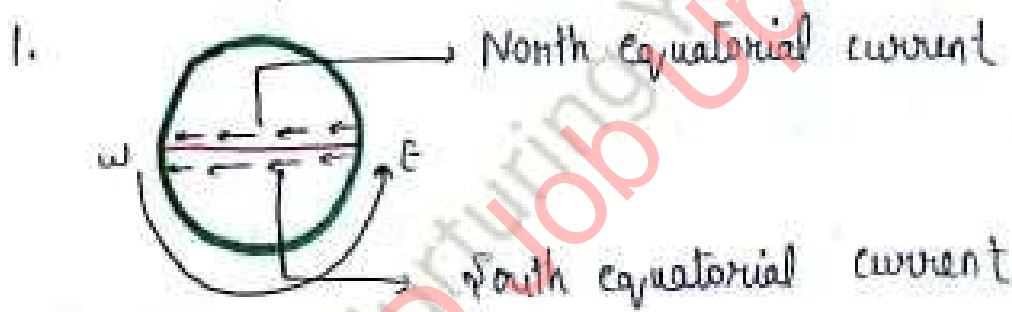
Where river merges into an ocean firstly it decreases salinity and then increases salinity.

Nile-Lake Assal - Max<sup>m</sup> salinity lake of the world.  
(440‰)

Ocean Current :-



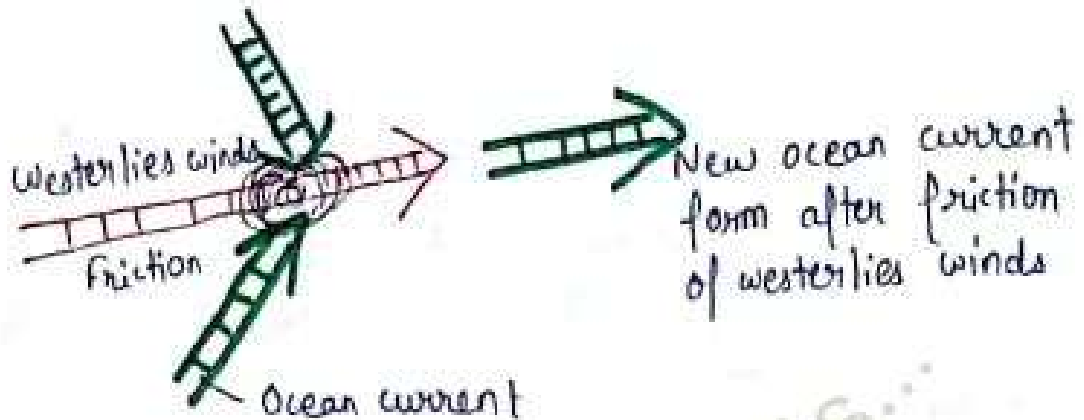
Formation of ocean current -



3.



4.



- Ocean current is formed by the differences of temperature, pressure, salinity and density of oceanic water with rotation of the earth, coastal line shape of coastal area and the effect of permanent winds.

Currents of Atlantic ocean:-

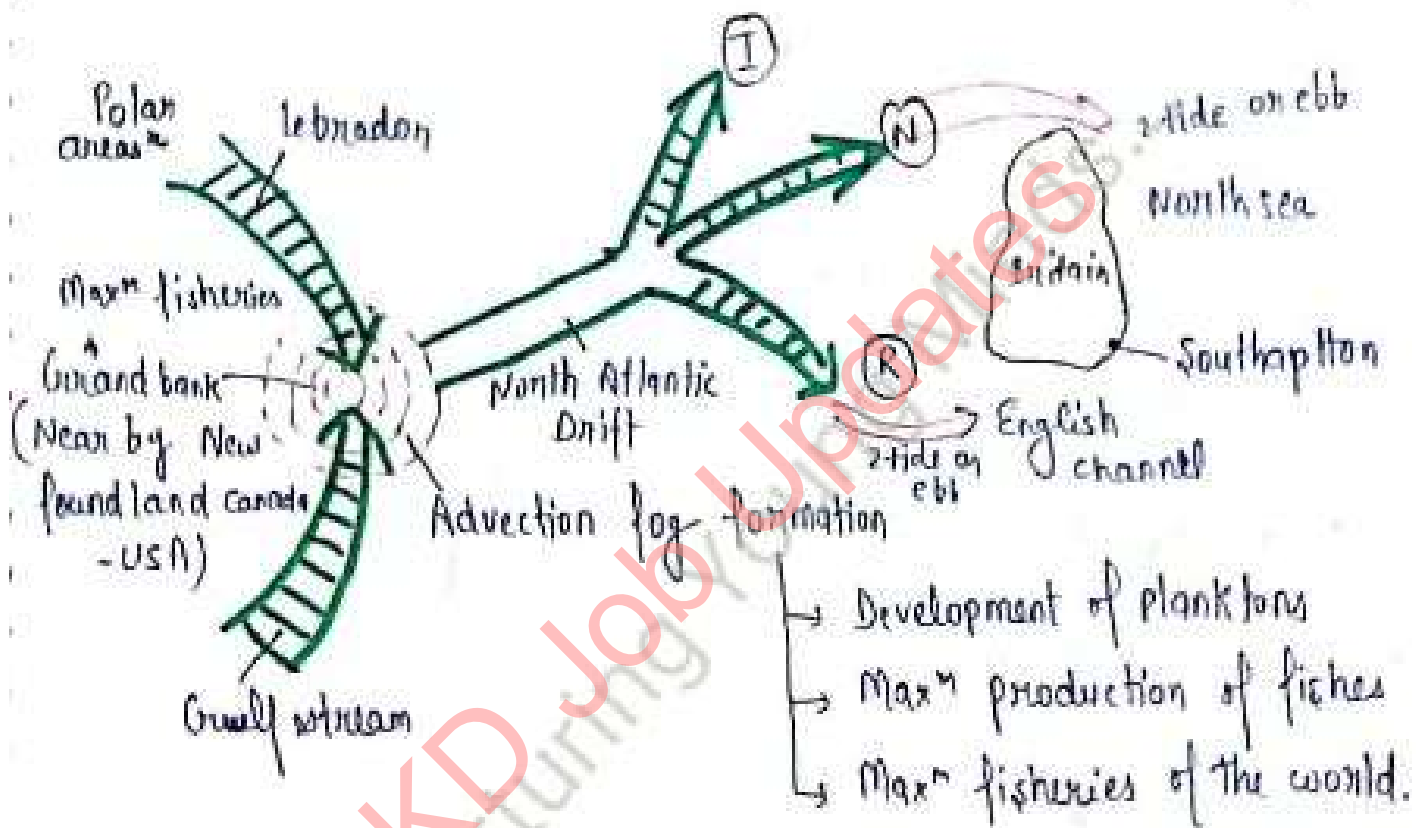
Warm Current	Cold current
<ol style="list-style-type: none"> <li>1. Antilles</li> <li>2. Florida</li> <li>3. Gulf stream</li> <li>4. North Atlantic drift               <ul style="list-style-type: none"> <li>→ Brimigan</li> <li>→ Norwegian</li> <li>→ Rennel</li> </ul> </li> <li>5. Brazil current</li> </ol>	<ol style="list-style-type: none"> <li>1. Labrador (coldest current)</li> <li>2. Canary</li> <li>3. Benguela</li> <li>4. Falk land</li> </ol>



Gulf stream:- → Hottest current.

- \* It was discovered by Pons-de-Leon.
- \* It flows on east coast of America.

Note- 'Port of North pole' is open for trade throughout the year because of presence of North-Atlantic drift (Norwegian).  
Northern most part of the world - Murmansk - Kola Peninsula (Russia)



- Note-
1. St. George Pierri Bank - USA
  2. Doggar bank - Britain

Southampton (Britain) → 4 tides and 4 ebb occurs in a day.

Highest tide of the world - Bay of Fundi.

## Currents of Pacific Ocean :-

Warm Current	Cold current
<ol style="list-style-type: none"><li>1. Kuro shio — Called black current</li><li>2. Tsushima → On coast of Japan</li><li>3. Alaska current</li><li>4. East Australian current</li><li>5. ELNINO</li></ol>	<ol style="list-style-type: none"><li>1. Oyoshio / Kuroiel</li><li>2. California</li><li>3. Peru / Humbolt</li><li>4. LA NINA</li></ol>

## Currents of Indian Ocean :-

Warm Current	Cold current
<ol style="list-style-type: none"><li>1. Agulhas</li><li>2. Mozambique</li><li>3. Malagasi</li></ol>	<ol style="list-style-type: none"><li>1. Somali current</li><li>2. West Australian current</li></ol>

Current :- No direction

Drift :- Direction → Oceanic water flows in direction

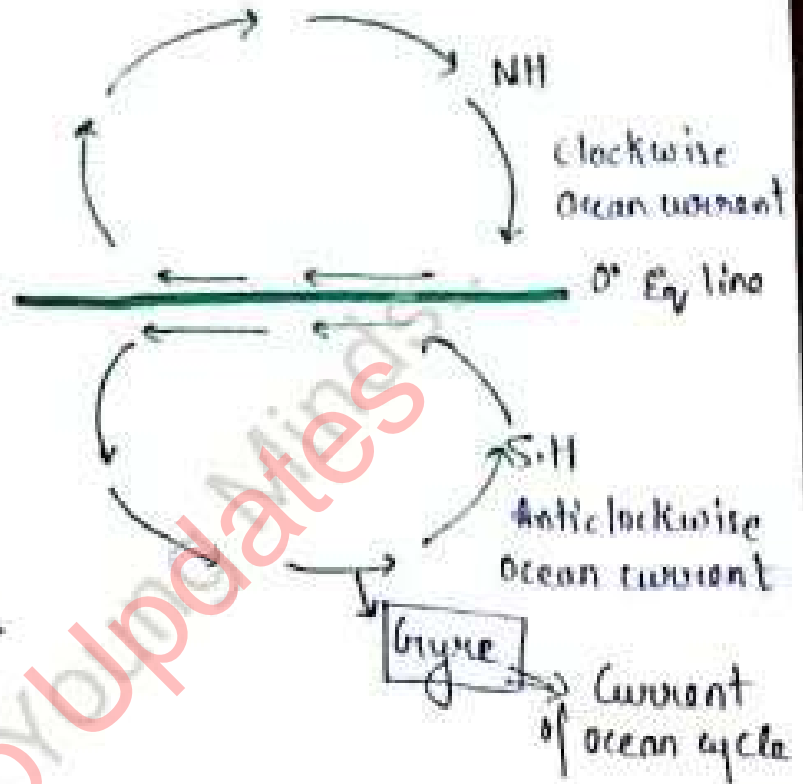
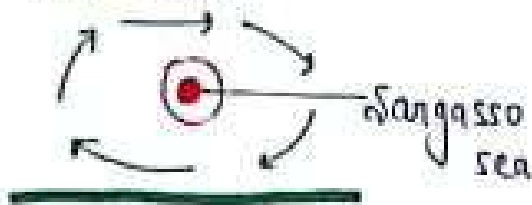
Stream :- Direction with max<sup>m</sup> speed of oceanic water and flows like a rivers.

## Magellan →

- \* Pacific ocean has given a name 'Pacific' by Magellan.
- \* He was the first person who circumnavigated whole world at first time.

## Sargasso sea :-

- Found in Atlantic ocean.
- Calm and stable zone.
- Sargassum grass is found in this sea.



## Bermuda triangle :-

Atlantic ocean.

Miami Florida, USA

