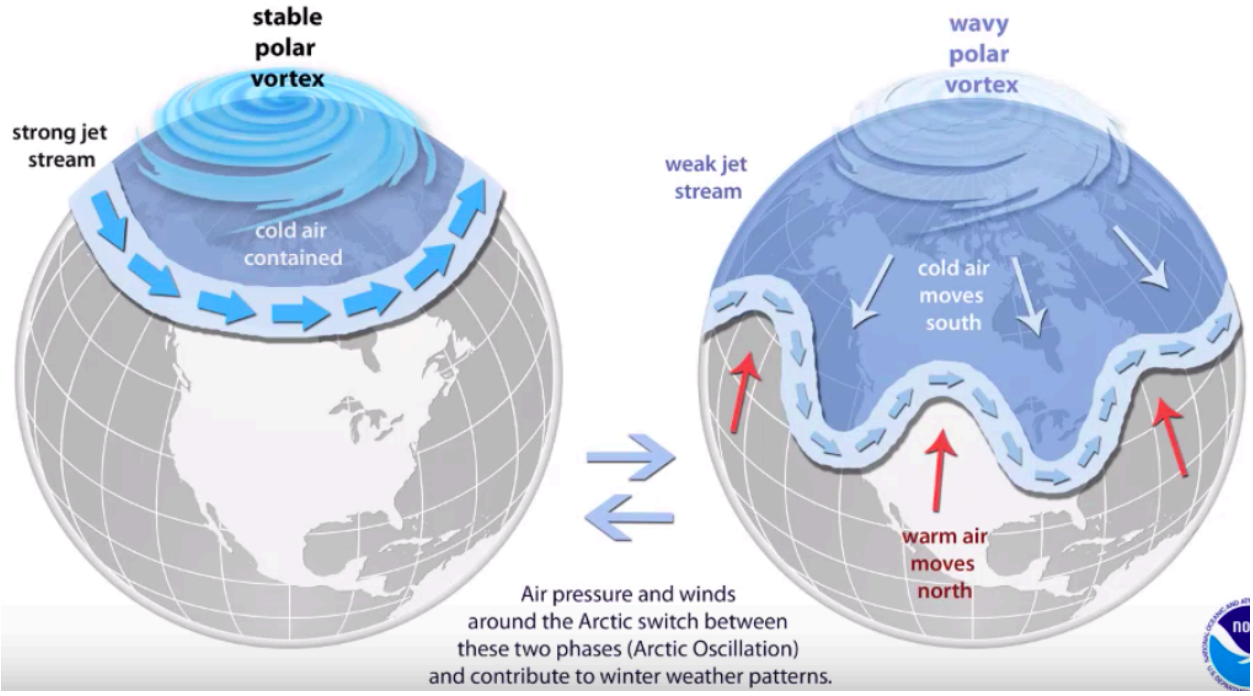
Geography Quick Facts:

POLAR Vortex(whirlwind =चक्राकार) :

- *is an **upper-level** low-pressure area lying near one of the Earth's poles. There are two polar vortices in the Earth's atmosphere, overlying the North and South Poles.*
- *It is large area of low pressure and cold air surrounding earth's North and South pole.*
- *Because of breaking of Polar Vortex , Cold air moves towards south from North pole.*
- *The strong Jet stream blowing at 7-8 Km above earth's surface plays pivotal role to binding the polar vortex around north pole*
- *But every year due to some environmental changes , Polar vortex got broken and use to move towards south.*
- *Some scientists guess that It is happening due to Ice melting at North pole which is result of Global warming. More studies need to be done on this point.*



Grand Canyon National Park, in Arizona, is home to much of the immense Grand Canyon, with its layered bands of red rock revealing millions of years of geological history. Viewpoints include Mather Point, Yavapai Observation Station and architect Mary Colter's Lookout Studio and her Desert View Watchtower. Lipan Point, with wide views of the canyon and Colorado River, is a popular, especially at sunrise and sunset.

Canary Current is a wind-driven surface current that is part of the North Atlantic Gyre. This eastern boundary current branches south from the North Atlantic Current and flows southwest about as far as Senegal where it turns west and later joins the Atlantic North Equatorial Current.

A **nautical mile** is based on the circumference of the earth, and is equal to ***one minute of latitude***. It is slightly more than a statute (land measured) mile (1 nautical mile = 1.1508 statute miles). Nautical miles are used for charting and navigating.

Farthest points in India :

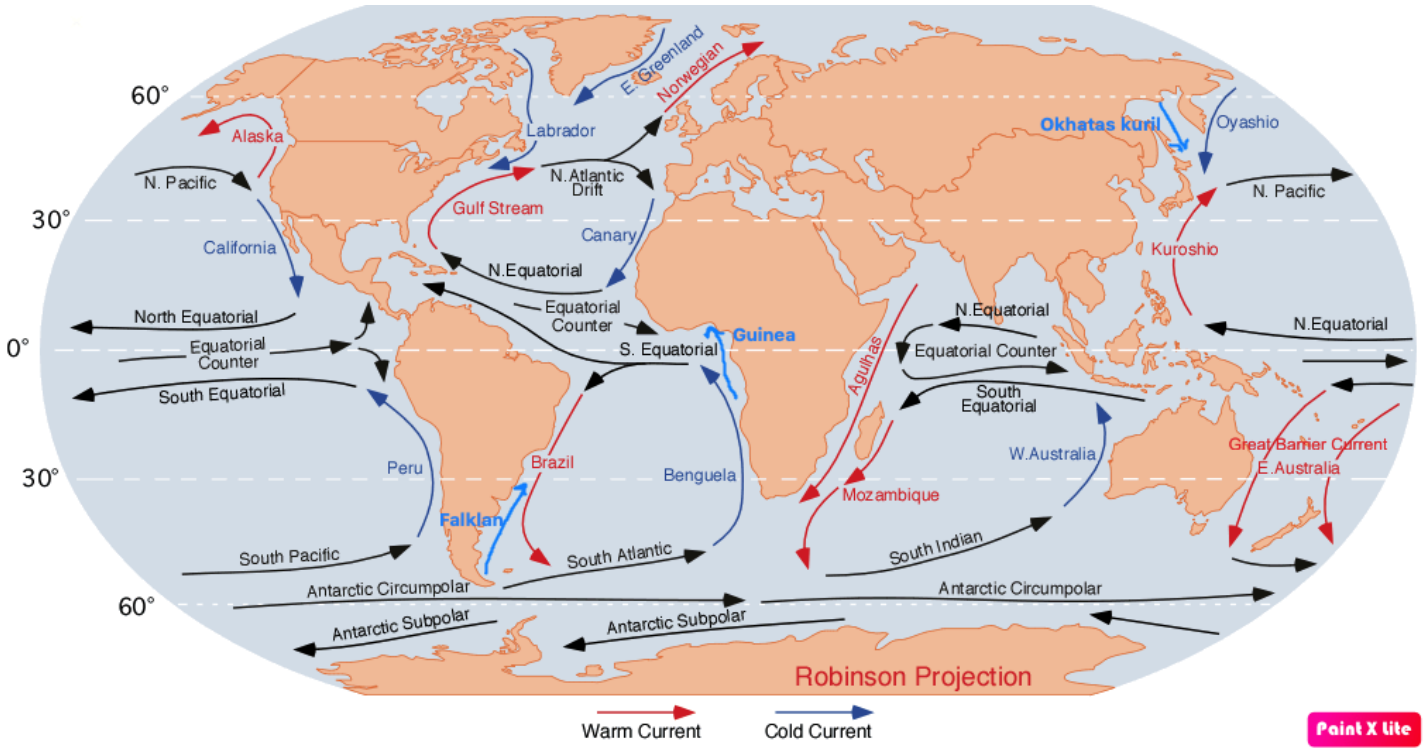
1. Indira Point --- southern
2. Indira Kol -- Northern
3. Kibithu --- Eastern
4. Guhar Moti -- Western

Land borders of India [edit]

Land Border Country	Length (km) and (mi) [1]	Force
Bhutan	600 kilometres (370 mi)[2]	Sashastra Seema Bal
Myanmar	1,643 kilometres (1,021 mi)	Assam Rifles and Indian Army
Nepal	1,758 kilometres (1,092 mi)[2]	Sashastra Seema Bal
Pakistan	3,323 kilometres (2,065 mi)	Border Security Force
China	3,380 kilometres (2,100 mi)	Indo-Tibetan Border Police and Special Frontier Force
Bangladesh	4,097 kilometres (2,546 mi)	Border Security Force
Sri Lanka	30 kilometres (19 mi)	Indian Coast Guard

OCEANIC Currents

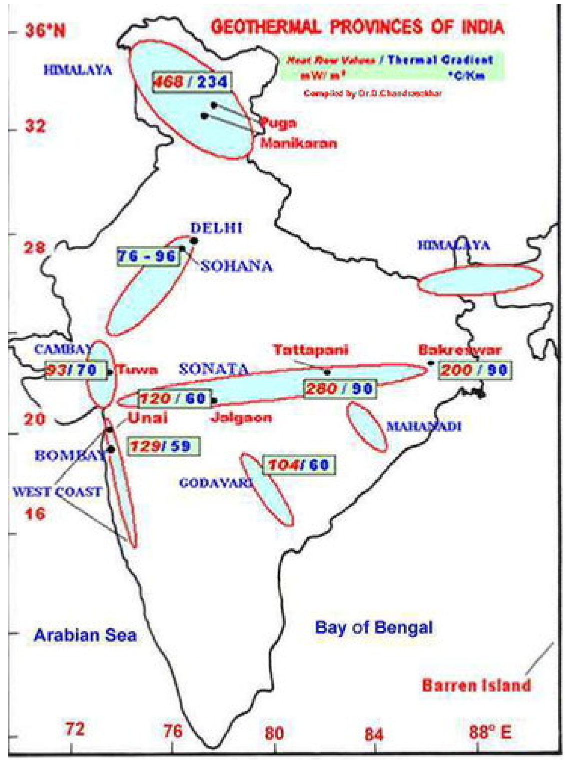
- Cold currents in Pacific Ocean : P,C,O
- Cold Currents in North Atlantic Ocean : C,G,L
- Cold Currents in South Atlantic Ocean : B,G,F



Hot spring in India:

A **hot spring** is a spring produced by the emergence of geothermally heated groundwater that rises from the Earth's crust. While some of these springs contain water that is a safe temperature for bathing, others are so hot that immersion can result in injury or death.

- Rajgir, Nalanda, Bihar
- Ganeshpuri, **Akloli**, Vajreshwari Maharashtra
- **Tattapani**, Shimla, Himachal Pradesh
- Garampani, Garampani Wildlife Sanctuary, Karbi Anglong district, Assam
- Unapdev, and Sunapdeo Maharashtra
- **Manikaran**, Himachal Pradesh
- Chumathang, Ladakh
- **Bendru** Theertha, **Puttur**, Karnataka
- **Chavalpani** Near Pachmarhi, Madhya Pradesh.
- Suryakund, Near Gaya, [Bihar]
- **Sikkim** has many hot springs including Phurchachu (Reshi), Yumthang, Borang, Ralang, Taram-chu and Yumey Samdong. All these hot springs have high sulfur content and are located near the river banks. The average temperature of the water in these hot springs is 50 °C (122 °F).
- **Taptapani** near Berhampur, Atri near Bhubaneswar, on[Tarabalo] in Nayagarh District of Orissa
- **Bakreshwar**, Birbhum, West Bengal
- kheerganga, parvati valley, Himachal Pradesh
- Tulsishyam near Tulsishyam temple, Gir Forest, Junagadh district, Gujarat
- **Sohna** hot spring, Located in Sohna, Gurgaon it is 56 kilometres (35 mi) from Delhi.
- **Lasundra** is hot water spring famous for all over Gujarat.
- Gandhaunia, near Mandu, Ramgarh district, Jharkhand
- **Unai** near Vansda, Gujarat
- **Atri** hot spring, Khordha, Odisha. 42 km from Bhubaneshwar
- Deulajhari hot spring, Angul, Odisha.
- **Unkeshwar** hot spring, Located at Unkeshwar Village in Kinwat Taluka, Dist. Nanded (Maharashtra.)


AFGH.
PAKISTAN
CHINA (TIBET)
NEPAL
BHU
BANG.
INDIA
MYANMAR (BURMA)
SRI LANKA
Arabian Sea
Bay of Bengal
Indian Ocean
Batalik
Panamik
Chushul
Puga
Kasol
Manikaran
Badrinath
Joshimath
Gaurikund
Sohna
Sariska
Gangtok
Tawang
Dirang
Rajgir
Munger
Dumka
Bakreswar
Dhanbad
Pachmarhi
Tattapani
Amarkantak
Mandla
Angul
Khurda
Sunakhala
Taptapani
Yavatmal
Kinwat
Morsi
Chopda
Lasundra
Dholka
Godhra
Shahada
Junagadh
Vyara
Sakri
Mahim
Thane
Vasai
Pali
Dasgaon
Dapoli
Gundala
Bugga
Bhadrachalam
Sangameshwar
Rajapur
Beltangadi
Puttur

GEOTHERMAL PROVINCES OF INDIA
Heat flow Values / Thermal Gradient
mW/ m² °C/Km
36°N
32
28
20
16
72
76
80
84
88° E
HIMALAYA
468 / 234
Puga
Manikaran
DELHI
76 - 96
SOHANA
HIMALAYA
CAMBAY
93 / 70
Tuwa
SONATA
Tattapani
Bakreswar
200 / 90
280 / 90
120 / 60
Unai
Jalgaon
MAHANADI
BOMBAY
129 / 59
WEST COAST
GODAVARI
104 / 60
Arabian Sea
Bay of Bengal
Barren Island


मेडिसीन लाइन
अमेरिका - कनाडा
मैकमोहन लाइन
भारत - चीन
38 पैरलल
उत्तर कोरिया - दक्षिण कोरिया
डूरंड लाइन
अफ़ग़ानिस्तान - पाकिस्तान
हिंडेनबर्ग लाइन
जर्मनी - पोलैंड

Population densities of the continents:

- North America—60.7 people per square mile.
- South America—61.3 people per square mile.
- Europe—187.7 people per square mile.
- **Asia—257.8** people per square mile.
- Africa—103.7 people per square mile.
- **Australia—7.8** people per square mile.

"White Rust" Fungal Disease in ---------> **Mustard**

★ 'Pusa Sindhu Ganga' is a variety of —**Wheat**

★ The total number of Agro-ecological zones in India is —**20**

★ 'Golden rice' is a rich source of — **Vitamin A**

★ 'Yellow Vein Mosaic' is a disease of —**Okra**

★ 'Loam' is a mixture of —**Sand, clay and silt**

★ 'Sonalika' is an early maturing variety of —**Wheat**

★ Rice, Millet, Maize, Cotton are the crops of —**Kharif**

★ 'Ganga 101' and 'Ranjit Decan' are the varieties of —**Maize**

★ In fruits and vegetables, wax emulsion is used for —**Extension of storage life**

Northern Hemisphere is home to approximately **6.57 billion** people which is around **90%** of the earth's total human population of **7.3 billion people**.

INTERTIDAL zone : also known as the **foreshore** and seashore and sometimes referred to as the **littoral zone**, is the *area that is above water at low tide and under water at high tide*. It is very rich in nutrients and hence supports the **growth of Mangrove**s the best.

Mango Showers :

- In India, the mango showers occurs as the result of thunderstorm development over the Bay of Bengal.
- They are also known as **'Kalbaishakhi'** in Bengal, as **Bordoisila** in Assam and as **Cherry Blossom** shower or Coffee Shower in Kerala.
- Towards the close of the summer season, pre-monsoon showers are common, especially in Kerala, Karnataka and parts of Tamil Nadu in India. They help in the early ripening of mangoes, thus often referred to as '**mango showers**'.

Name of RICE in various states:

राज्य	शरद ऋतु Autumn	शीत ऋतु Winter	ग्रीष्म ऋतु Summer
पश्चिम बंगाल	ऑस	अमन	बोरो
असम	अहू	सली	बोरो
ओड़िशा	बियाली	सरद	डलुआ
बिहार	भदई	अगहनी	गरमा
केरल	विरुपु	मुंदकन	पुंजा
तमिलनाडु	कुरुवई/सोनांवरी	सांबा/थलाड़ी	नवराई

Western coasts in tropical regions receive lesser rainfall that in the eastern coasts of continents : BECAUSE the direction of flow of trade winds. The trade winds are moist, as they have passed over warm seas.
Since they are **easterlies**, they cause greater precipitation on the eastern coasts and run dry on the western coasts and interiors.

Gulf of Mannar is a large shallow bay forming part of the Laccadive Sea in the Indian Ocean. It lies between the southeastern tip of India and the west coast of Sri Lanka, in the Coromandel Coast region.

- Kandla, also known as the Kandla Port Trust or Deendayal Port is a seaport in Kutch District of Gujarat state in western India, near the city of Gandhidham.

- Chennai is India's first artificial port.

Main 3 passes between Tibet and India :

1. **Shipki La pass :** located b/w **Himachal Pradesh, India and Ngari prefecture, Tibet**
2. **Lipulekh pass** : located b/w **Uttarakhand, India and Ngari prefecture, Tibet**
3. **Nathu La pass** : located b/w **Sikkim, India and Shigatse prefecture, Tibet**

Changla Pass : located b/w Ladakh to Tibet

Banihal Pass – located b/w Jammu & Srinagar (thorugh Jawahar surang)
Jojila Pass ---- located b/w Srinagar to Leh

Peerpanjal pass --- Kulgaon to Kathi

Babusar paas
Khyber paas

Jelepla Pass – Sikkim
Bara Lacha La – Himachal Pradesh

Highest Pass of India :::: Karakoram Pass in Ladakh (at 5654 Meter)

The Burzil Pass is an ancient pass in northern India, and is part of the historic caravan route between Srinagar and Gilgit. The pass lies close to the Line of Control demarcating India and Pakistan, which has since closed the Burzil.

Passes links Lhasa with Ladakh ---- Lanak La or Lanak Pass is a mountain pass in Tibet Autonomous Region, China. It is on the southeastern boundary of the **Aksai Chin region that is controlled by China.** India regards Lanak La as its boundary with China.

Shortest National highway is NH 47A(Now called as NH 966B) , starts from Kundannoor to Willingdon Island in Kochi, Kerala. It covers a distance of 8 km (5.0 miles).

8 degree channel : separate Lakshadweep from Maldives

9 degree channel : separates Minicoy from Lakshdweep

200 kilometres of the **Nine Degree Channel** separating Kalpeni and Suheli Par from Minicoy sees the passage of nearly all merchant shipping between Europe, the Middle-East and Western Asia with South-East Asia and the Far-East.

Ten Degree Channel is a channel that separates the Andaman Islands and Nicobar Islands from each other in the Bay of Bengal. *Ten degrees Channel* separates Andaman group from Nicobar group whereas **Duncan passage** separates Little Andaman from South Andaman *capital Port Blair is located in South Andaman.*

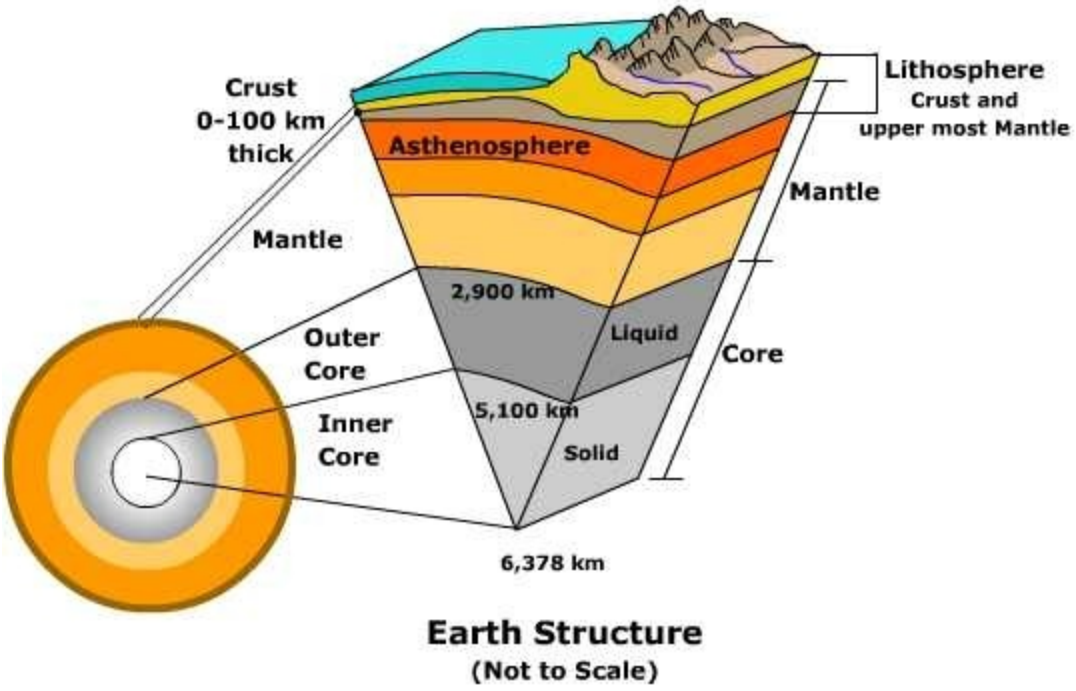
Leeward slope : Windward is the direction upwind from the point of reference, alternatively the direction from which the wind is coming.
Leeward is the direction downwind (or downward) from the point of reference. The *leeward region of mountains generally remains dry as compared to the windward.*

Pacific Shadow Zone : The oldest water in the ocean is in the ***North Pacific*** and has remained ***trapped*** in a shadow zone around ***2 Kms*** below the sea surface for over 1,000 years.

TRIBEs

- Arunachal Pradesh – Abor, Mishmi, Apatani etc
- Manipur – Sema, Tangkhul etc
- Meghalaya – Chakma, Garo etc
- Mizoram – Khasi, Jantia, Kuki etc

Asthenosphere : the upper layer of the earth's mantle, below the lithosphere, in which there is relatively low resistance to plastic flow and convection is thought to occur.



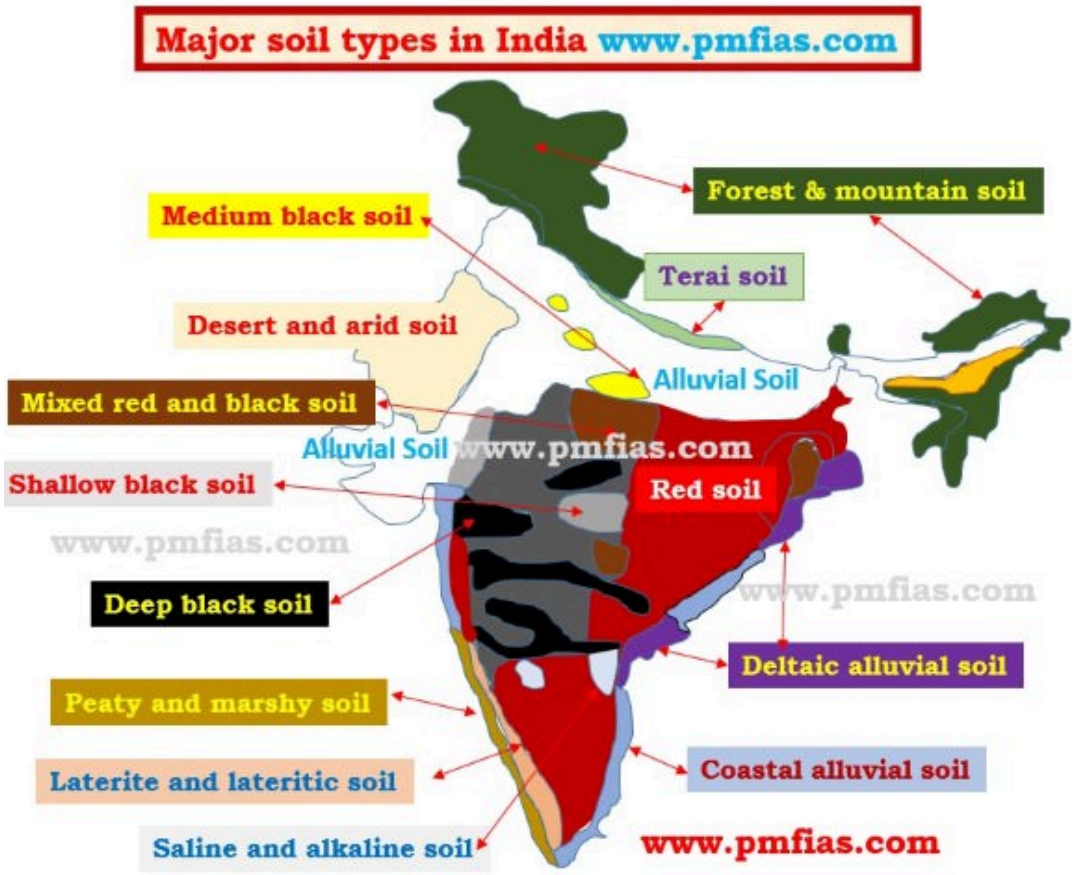
Intensity of irrigation : the percentage of net irrigated area to the net sown area.
Low intensity Area : which either do not need irrigation by *virtue of high and dependable rainfall* or they have not been able to develop irrigation facility due to unfavourable geographical conditions such as rugged topography, hard rocks, infertile soils, lack of surface and groundwater.

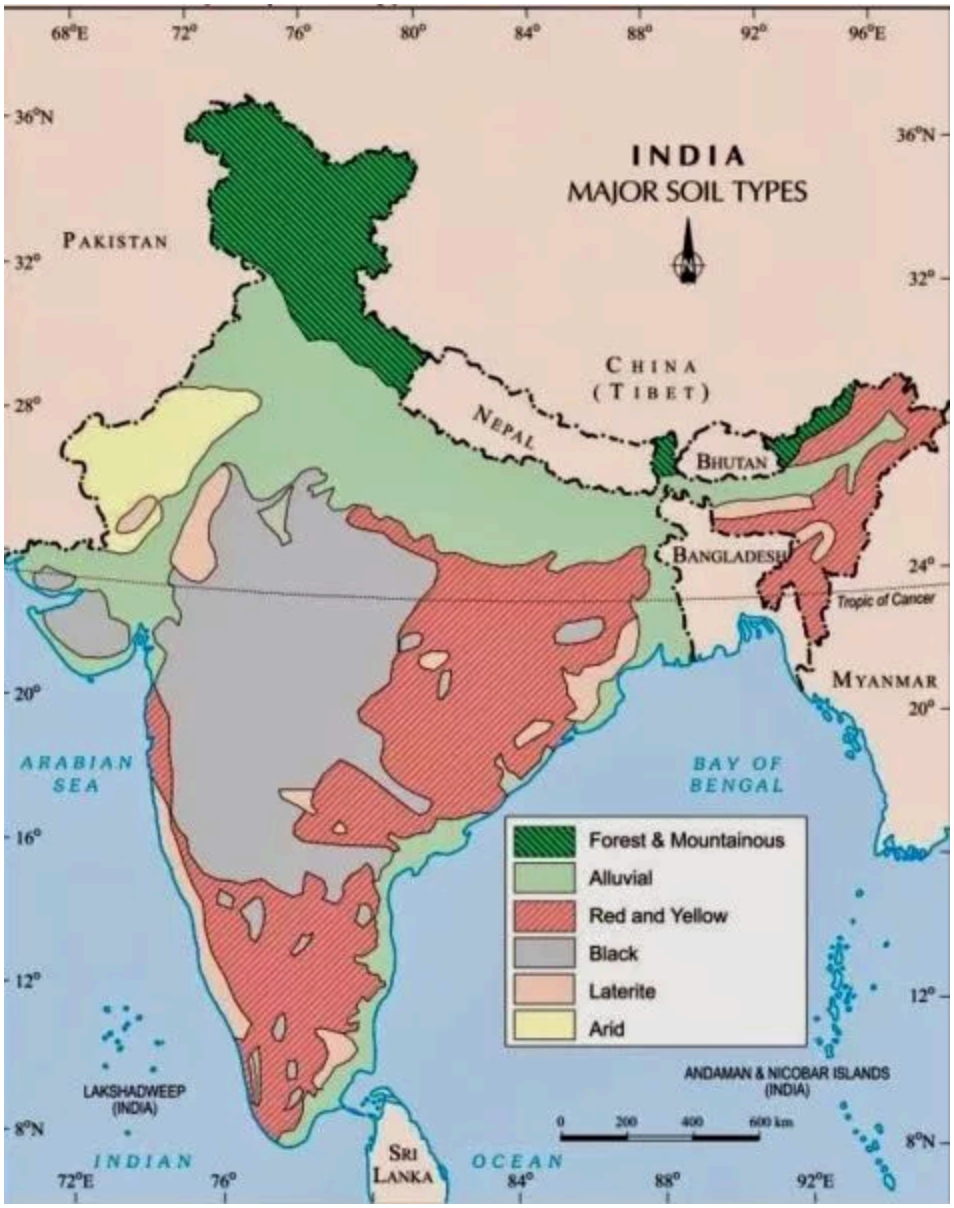
Dry areas of Ladakh district in Jammu and Kashmir and Lahaul and Spiti in Himachal Pradesh cannot raise crops without irrigation as these areas are believed to have 100% intensity of irrigation.

Calamine : a historic name for an ore of **zinc**. The name calamine was derived from lapis calaminaris, the old name for zinc ores in general.

- Epsomite is not an aluminium ore. It is a hydrous magnesium sulfate mineral.
- An ore is a mineral-rich rock from which metals are extracted. Every ore is specific for a given metal.
- Bauxite ($Al_2O_3.2H_2O$) is the major ore of aluminium. Other ores of aluminium are Cryolite (Na_3AlF_6) and Corundum (Al_2O_3).

SOILS in INDIA :




INDIA
MAJOR SOIL TYPES
PAKISTAN
CHINA (TIBET)
NEPAL
BHUTAN
BANGLADESH
MYANMAR
Tropic of Cancer
ARABIAN SEA
BAY OF BENGAL
INDIAN OCEAN
SRI LANKA
LAKSHADWEEP (INDIA)
ANDAMAN & NICOBAR ISLANDS (INDIA)
Forest & Mountainous
Alluvial
Red and Yellow
Black
Laterite
Arid
0 200 400 600 km
68°E
72°
76°
80°
84°
88°
92°
96°E
36°N
32°
28°
24°
20°
16°
12°
8°N

Laterite Soil:

- The laterite soils develop in areas with high temperature and high rainfall.
- They are formed under conditions of **high** temperature and **heavy** rainfall with alternate ***wet and dry periods***
- **Laterite soils** are mostly the end products of weathering.
- **Laterite soils** are **red** in colour due to little **clay** and more gravel of **red** sand-stones.
- Humus content of the soil is removed fast by bacteria that thrives well in high temperature.
- These soils are poor in organic matter, nitrogen, phosphate and calcium, while **iron oxide and potash are in excess.**
- Laterite soils are widely cut as **bricks** for use in house construction.
- These soils have mainly developed in the higher areas of the Peninsular plateau.
- The laterite soils are commonly found in **Karnataka**, **Kerala**, **Tamil** Nadu, Madhya Pradesh and the hilly areas of Odisha and Assam.

Salinity is the measure of all the salts dissolved in water. Salinity is usually measured in parts per thousand (ppt or). The average ocean salinity is 35ppt and the average river water salinity is 0.5ppt or less. This means that in every kilogram (1000 grams) of seawater, 35 grams are salt.

Alkalinity is a measure of the water's ability to neutralize acidity. An alkalinity test measures the level of bicarbonates, carbonates, and hydroxides in water and test results are generally expressed as "ppm of

calcium carbonate ($CaCO_3$)". The desirable range for irrigation water is 0 to 100 ppm calcium carbonate.

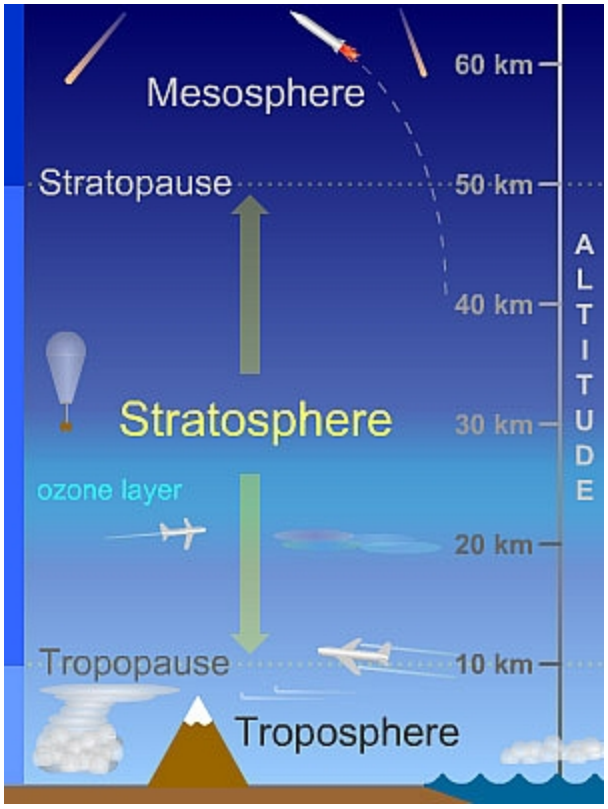
Holocene extinction :

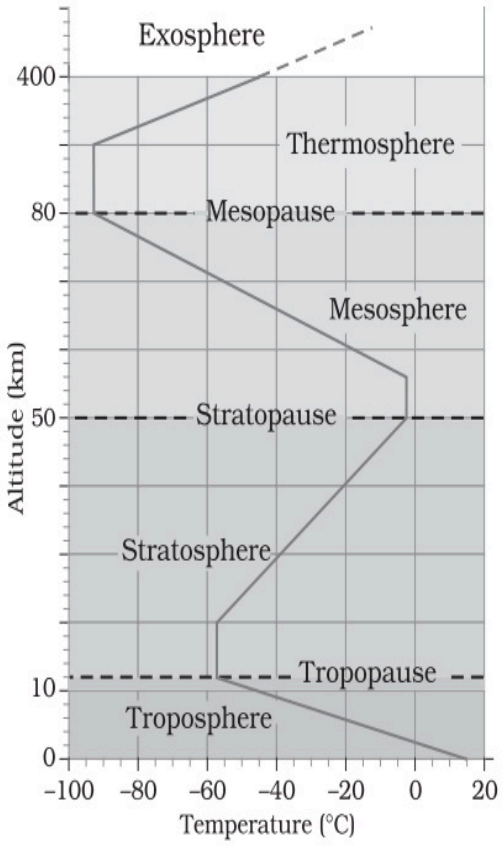
- referred to as **Sixth extinction** or **Anthropocene extinction**, is the ongoing extinction event of species during the present Holocene epoch, mainly as a ***result of human*** activity.
- The large number of extinctions spans numerous families of plants and animals, including mammals, birds, amphibians, reptiles and arthropods.
- With widespread *degradation of highly bio-diverse habitats* such as coral reefs and rainforests, as well as other areas, the vast majority of these extinctions is thought to be *undocumented*, as we are either not even aware of the existence of the species before they go extinct, or we haven't yet discovered their extinction.
- The current rate of extinction of species is estimated at 100 to 1,000 times higher than natural background rates.

5 layers in the structure of atmosphere depending upon temperature:

1. **Troposphere :** height of 7 to 20 km , has water vapour and mature particles
2. **Stratosphere :** up to 50 km of height, very dry as it contains little water vapour , ozone layer is found in this layer
3. **Mesosphere :** coldest of the atmospheric layers , from 50 km to 85 km, Meteors burn up in this layer, temperature drops with altitude in this layer

4. **Thermosphere :** from 80 to 400 km, Radio waves which are transmitted from the earth are reflected back by this layer. The temperature increases with height. *Aurora* and *satellites* occur in this layer.
5. **Ionosphere :** between 80 and 400 km , consists of electrically charged particles , this layer is ionized by cosmic and solar radiation.
6. **Exosphere :** extends from the top of the thermosphere up to 10,000 km, in this outermost layer here molecules and atoms escape into space is mentioned as the exosphere.





Stars twinkle because of turbulence in the atmosphere of the Earth. As the atmosphere churns, the light from the star is **refracted** in different directions. Thiscauses the star's image to change slightly in brightness and position, hence "twinkle."

*Why is the **eastern coast and Bay of Bengal more prone** to **tropical cyclones** than the Western Coast and Arabian Sea :*

- *According to the India Meteorological Department, this is because in addition to the storms that originate in the southeast Bay of Bengal and the adjoining Andaman Sea, breakaway typhoons over the Northwest Pacific move across the South China Sea into the Bay of Bengal, intensifying into cyclones.*
- *As the frequency of typhoons over the Northwest Pacific is about **35%** of the global annual average, the Bay of Bengal is affected.*
- *In contrast, **Arabian Sea cyclones** are mostly their own formations and they also generally move north-west, away from India's west coast.*
- *Besides, the Arabian Sea is colder than the Bay of Bengal, which inhibits the formation and intensification of the cyclonic system in the former.*
- *Warm sea surface temperature is an ideal platform for cyclones.*

Pattern of Wind Direction in Cyclones and Anticyclones:

Pressure System	Pressure Condition at the Centre	Pattern of Wind Direction	Pattern of Wind Direction
		Northern Hemisphere	Southern Hemisphere

Cyclone	*Low*	*Anticlockwise*	*Clockwise*
Anticyclone	*High*	*Clockwise*	*Anticlockwise*

***Temperature inversion**, a reversal of the normal behaviour of temperature in the troposphere (the region of the atmosphere nearest the Earth's surface), in which a layer of cool air at the surface is overlain by a layer of warmer air. (Under normal conditions air temperature usually decreases with height.)*
Temperature inversion is a phenomenon where a layer of warm air is formed on top of a layer of cold air, unlike in normal atmospheric conditions.

One of the most noticeable effects of a temperature inversion is on air quality. During the winter, temperature inversions are stronger and more common. This is generally when air quality suffers most as a result of temperature inversions. The warm air on top of the cool air acts as a lid, trapping pollution such as car emissions and smoke from fireplaces close to the ground. This results in hazy skies and poor air quality.

Temperature inversions are also responsible for certain cloud formations. When clouds form just below the inversion in the sky, they spread out and have a very flat smooth appearance. These clouds are often seen over cool ocean waters where temperature inversions are common.

Temperature inversions can keep thunderstorms from forming. Most thunderstorms happen during hot and humid weather at the surface, but they are unable to strengthen if the tops of the storms are unable to rise and retain their heat energy. When the typical temperatures are applied to the atmosphere with cooler temperatures at higher altitudes, it actually forms an unstable air layer that is ideal for the formation of thunderstorms

Yangtze River is the **third longest world**wide and the **longest** river in the Asia with a length of 6,300 km.
The other long Asian rivers are the **Yellow** River, River **Mekong** and **Brahmaputra** and **Indus** Rivers.

Multi-purpose dam projects : Some of the adverse consequences of such projects are:

- **Floods**: The dams that were constructed to control floods have triggered floods due to sedimentation in the reservoir. Moreover, the big dams have mostly been unsuccessful in controlling floods at the time of excessive rainfall. The floods have not only devastated life and property but also caused extensive soil erosion.
- **Land degradation**: *Sedimentation in the dams* deprives the floodplains of **silt, a natural fertiliser,** further adding on to the problem of land degradation.
- **Earthquakes**: Due to the huge volume of impounded water, external pressure is exerted on the tectonic plates, which may induce sudden movements causing earthquakes.
- **Pests** : Stagnant water stored in the reservoirs act as *breeding ground for waterborne diseases* and pests and pollution resulting from excessive use of water.

Rivers in India :

Geographical features created by Himalayan rivers

- These rivers pass through the giant gorges carved out by the erosional activity carried on simultaneously with the uplift of the Himalayas.
- Besides deep gorges, these rivers also form V-shaped valleys, rapids and waterfalls in their mountainous course.

- While entering the plains, they form depositional features like flat valleys, ox-bow lakes, flood plains, braided channels, and deltas near the river mouth.
- In the Himalayan reaches, the course of these rivers is highly tortous, but over the plains they display a strong meandering tendency and shift their courses frequently.
- The Himalayan drainage system has evolved through a long geological history.
- It mainly includes the Ganga, the Indus and the Brahmaputra river basins. Since these are fed both by melting of snow and precipitation, rivers of this system are perennial.

The Indus, the **Sutlej**, the **Ganga**, the **Ghaghra**, the **Kosi**, the **Brahmaputra** etc., are ***antecedent to all of the three ranges*** of the Himalayas as they cut across the Greater, the Lesser and the Outer Himalayan ranges.

Devaprayag – Confluence of **A**laknanda and **B**hagirathi
Vishnuprayag – Confluence of **A**laknanda and **D**hauliganga
Rudraprayag – Confluence of **A**laknanda and **M**andakini
Karanprayag – Confluence of **A**laknanda and **P**indar

Gandak River

- comprises two streams, namely ***Kaligandak*** and ***Trishulganga***.
- It rises in the Nepal Himalayas between the ***Dhaulagiri*** and ***Mount Everest*** and drains the central part of Nepal.
- It enters the Ganga plain in ***Champaran*** district of Bihar and joins the Ganga at ***Sonpur*** near Patna.

Ghaghara River

- originates in the ***glaciers of Mapchachun***go.

- After collecting the waters of its tributaries – ***Tila, Seti and Beri***, it comes out of the mountain, cutting a deep gorge at ***Shishapani***.
- The river ***Sarda*** (***Kali or Kali*** Ganga) joins it in the plain before it finally meets the Ganga at ***Chhapra***.

Cauvery River

- On its journey to the Bay of Bengal, the river is joined by its tributaries, which include ***Shimsa, Hemavathi, Honnuhole, Arkavathi, Kapila, Lakshmana Theertha, Kabini, Lokapavani, Bhavani, Noyil and Amaravathy***.
- It is bounded by the Western Ghats on the west, by the Eastern Ghats on the east and the south and by the ridges separating it from ***Krishna basin and Pennar basin*** on the north.
- The Cauvery River is one of the major rivers of the peninsula.

Jhelum River :

- rises from a spring at ***Verinag*** situated at the foot of the ***Pir Panjal*** in the south-eastern part of the valley of Kashmir.
- It flows through **Srinagar** and the **Wular** lake before entering Pakistan through a deep narrow gorge.
- It joins the ***Chenab near Jhang*** in Pakistan.

Chenab River :

- is the largest tributary of the Indus.
- It is formed by two streams, the **Chandra** and the **Bhaga**, which join at Tandi near Keylong in Himachal Pradesh. Hence, it is also known as Chandrabhaga.
- The river flows for 1,180 km before entering into Pakistan.

Ravi River :

- important tributary of the Indus, rises west of the Rohtang pass in the Kullu hills of Himachal Pradesh and flows through the Chamba valley of the state.
- Before entering Pakistan and joining the Chenab near Sarai Sidhu, it drains the area lying between the southeastern part of the Pir Panjal and the Dhauladhar ranges.

Brahmaputra River

- It originates in the Chemayungdung glacier of the Kailash range near the Mansarovar lake.
- From here, it traverses eastward longitudinally for a distance of nearly 1,200 km in a dry and flat region of southern Tibet, where it is known as the **Tsangpo**, which means 'the **purifier**.'
- The Rango Tsangpo is the major right bank tributary of this river in Tibet.
- It emerges as a turbulent and dynamic river after carving out a deep gorge in the Central Himalayas ***near Namcha Barwa (7,755*** m).
- The river emerges from the foothills under the name of Siang or Dihang.
- It enters India west of ***Sadiya town in Arunachal Pradesh.***
- Flowing southwest, it receives its main left bank tributaries, viz., ***Dibang or Sikang and Lohit***; thereafter, it is known as the Brahmaputra.

Godavari River's Important Tributaries – **Penganga, Wainganga, Wardha, Pranahita, Manjra, Maner** etc.

On the basis of the size of the watershed, the **drainage basins of India are grouped** into three categories:

(i) Major river basins with more than 20,000 sq. km of catchment area. It includes 14 drainage basins such as the Ganga, the Brahmaputra, the Krishna, the Tapi, the Narmada, the Mahi, the Pennar, the Sabarmati, the Barak, etc.

(ii) Medium river basins with catchment area between 2,000-20,000 sq. km incorporating 44 river basins such as the Kalindi, the Periyar, the Meghna, etc.

(iii) Minor river basins with catchment area of less than 2,000 sq. km include fairly good number of rivers flowing in the area of low rainfall.

Damodar occupies the *eastern margins of the Chotanagpur Plateau* where it flows through a rift valley and finally joins the Hugli. Barakar is its main tributary.

Sharda River or **Mahakali** River is also called **Kali** Gad or **Kali Gang**a in Uttarakhand where the river *demarcates Nepal's western border with India.*

FORCES AFFECTING THE EARTH'S CRUST

ENDOGENIC OR ENDOGENETIC

DIASTROPHIC

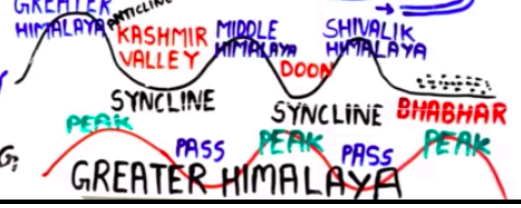
EPEIROGENIC FORCES (VERTICAL MOVEMENT)

- EMERGENCE (UPWARD MOVEMENT)
  - NEW FOUNDLAND 0.8 MM/YEAR
  - SCANDINAVIA 7.0 MM/YEAR
  - ALASKA 4.0 CM/YEAR
  - NORTH SWEDEN 9.0 MM/YEAR
- SUBMERGENCE (DOWNWARD MOVEMENT)
  - GULF COAST 6.6 MM/YEAR
  - EAST COAST OF INDIA 1.2 MM/YEAR

FINLAND GAINS 7 KM^2 AREA OF NEWLAND ANNUALLY BY UPLIFT. APPLACHIAN RISING OR UPLIFTING @ 6MM/YEAR AND HIMALAYA OROGENIC FOLDING FORCES.

OROGENIC FORCES (HORIZONTAL MOVEMENT)

- TENSIONAL
  - CRACKING
  - CRUSTAL FRACTURE
  - FAULTING
  - BLOCK MT.
  - HORST
  - RIFT VALLEY
  - GRABEN
- COMPRESSIONAL
  - WARPING
    - UPWARPING (DOME)
    - DOWNWARPING (BASIN)
  - FOLDING
    - ISOCLINAL, MONOCLINAL, RECUMBENT, NAPPE



SUDDEN

- VOLCANO
- EARTHQUAKE
- LANDSLIDE
- AVALANCHE

EXOGENIC OR EXOGENETIC

WEATHERING

1. PHYSICAL OR MECHANICAL
2. CHEMICAL
3. BIOLOGICAL

EROSION

1. FLUVIAL
2. AEOLIAN
3. GLACIAL
4. PERIGLACIAL
5. MARINE
6. KARST

Farakka Barrage

- is a barrage across the Ganges River, located in Murshidabad district in the Indian state of West Bengal, roughly 16.5 kilometres (10.3 mi) from the border with Bangladesh near Chapai Nawabganj District.
- The Farraka dam was built *chiefly to divert the Ganges waters into the Hooghly River* (a distributary of the Ganges) during the ***dry season in order to remove the silt*** that had been hindering operations at the Kolkata Port – one of the busiest in India.

Teesta River : begins its journey in **Sikkim**, flows through **north Bengal** before entering Bangladesh. The other river on the India-Bangladesh discussion table is the **Feni**.

Feni, which flows 135 km south of Tripura capital Agartala, has been in dispute since 1934. In a total catchment area of 1,147 square km of the river, 535 square km falls in India and the rest in Bangladesh.

Cyclone Warnings are issued to state government officials in four stages.

1. First Stage warning : “PRE CYCLONE WATCH” issued **72 hours** in advance contains early warning about the development of a cyclonic disturbance
2. Second Stage warning : “CYCLONE ALERT” is issued at least **48 hrs**. in advance of the expected commencement of adverse weather over the coastal areas.

3. Third Stage warning : “CYCLONE WARNING” issued at least **24** hours in advance of the expected commencement of adverse weather over the coastal areas.
4. Fourth Stage of warning : “POST LANDFALL OUTLOOK” is issued at least **12** hours in advance of expected time of landfall.

VEGETATION :

- **Tropical moist** forests include **evergreen** forests, Tropical Semi-Evergreen Forests, Tropical Moist Deciduous Forests and Littoral and Swamp Forests.
- The Middle Andamans harbours mostly ***moist deciduous*** forests. North Andamans is characterised by the wet evergreen type.
- Western Ghats and NE states harbour both deciduous and evergreen forests.

Sl. No.	Forest Type	Area in Sq. Km.	Percentage
1.	Tropical Wet Evergreen Forest	51,249	8.0
2.	Tropical Semi Evergreen Forest	26,794	4.1
3.	Tropical Moist Deciduous Forest	236,794	37.0
4.	Littoral and Swamp Forest	4,046	0.6
5.	Tropical Dry Deciduous Forest	186,620	28.6
6.	Tropical Thorn Forest	16,491	2.6
7.	Tropical Dry Evergreen Forest	1,404	0.2
8.	Sub-Tropical Broad Leaved Hill Forest	2,781	0.4
9.	Sub-Tropical Pine Forest	42,377	6.6
10.	Sub Tropical Dry Evergreen Forest	12,538	2.5
11.	Mountain Wet Temperate Forest	23,365	3.5
12.	Himalayan Moist Temperate Forests	22,012	3.4
13.	Himalayan Dry Temperate Forest	313	-
14.	Sub-Alpine and Alpine	18,628	2.8

Producer	Biomass productivity ($gC/m^2/yr$)
Swamps and Marshes	2,500
Tropical rainforests	2,000
Coral reefs	2,000
Algal beds	2,000
River estuaries	1,800
Temperate forests	1,250
Cultivated lands	650
Tundras	140
Open ocean	125
Deserts	3

Further Open oceans > Deserts > Temperate forests > Cultivated lands > Tropical forests is the order of geographical area of these ecosystems.

Despite low primary productivity, oceans score higher on total biomass due to its huge spread over globe.

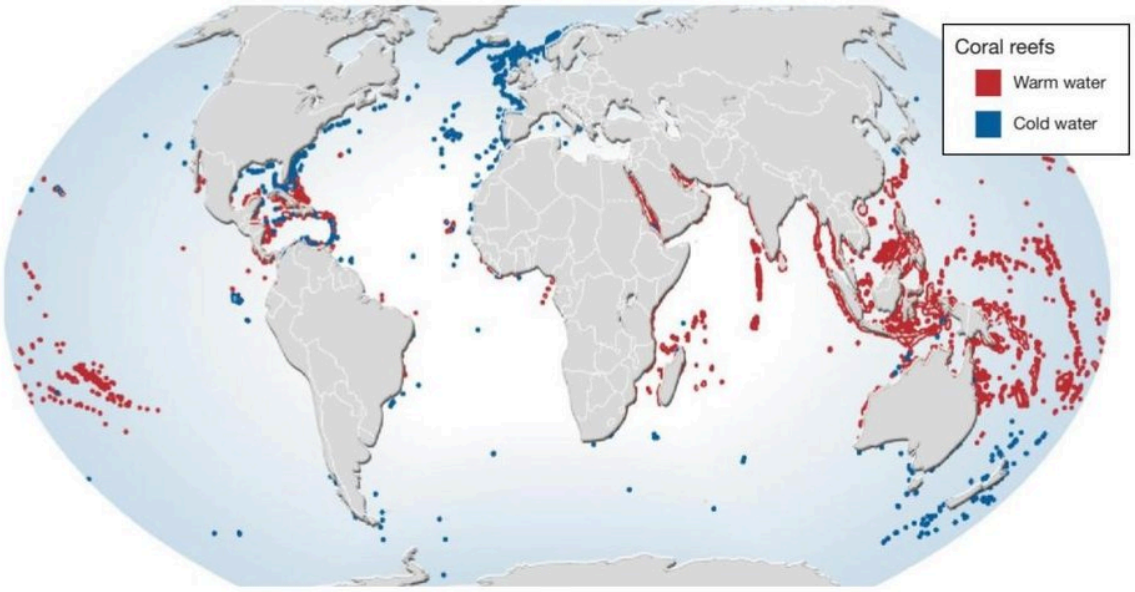
Karewa sequence of J&K :

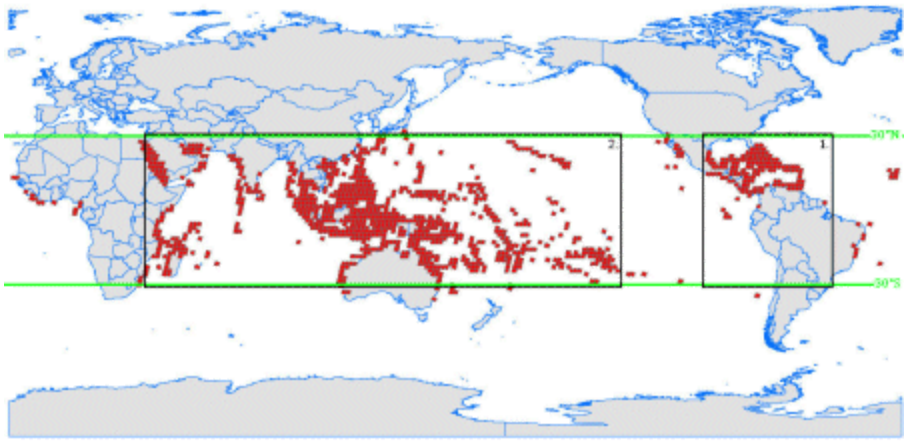
- occupying an area of about 2,500 sq km, rests over the folded Paleozoic-Mesozoic rocks of the Kashmir Basin in the Kashmir Valley floor, above the river alluvium.
- Karewa formations are lake-laid clays and shales. These are lacustine deposits and appear like flat mounds on the margin of high mountains.
- Most of the cultivated fields in the Kashmir Valley are situated on the Karewa sediments.

Phytosanitary certification is used to attest that consignments meet phytosanitary (regarding plants) import requirements and is undertaken by an **NPPO** (National Plant Protection Organization). To export to nations, it is mandatory that Indian rice exporters are registered with NPPO, the Indian government agency for inspecting the mills and granting certificates on plant health for export purposes.

Cold water or Deep water corals

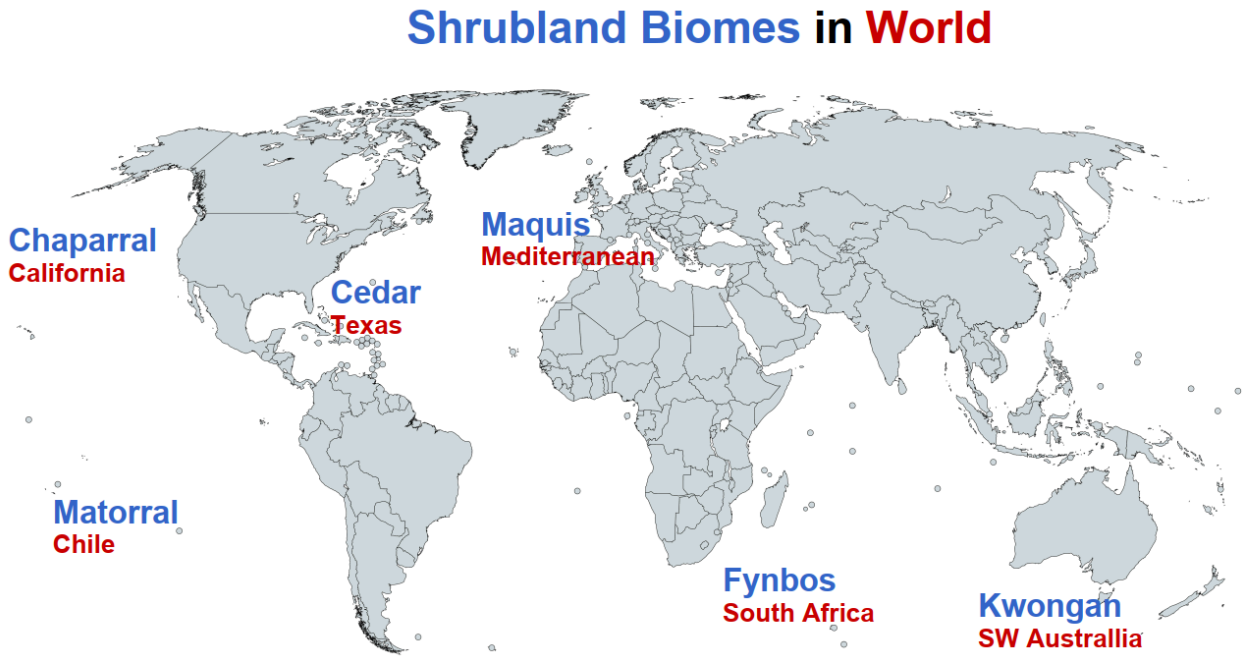
- do NOT have symbiotic relation with algae unlike tropical corals.
- The polyps of cold water corals are bigger than tropical corals
- Cold water corals are found in North-East as well as North-West Atlantic Ocean
- World’s largest known cold water coral is Rost Reef located in Norway




30°N
30°S
2
1

Shrubland Biomes Across The World :

Shrubland biomes are the bioregions where vegetation is dominated by evergreen sclerophyllous plants, particularly shrubs and short grasses. Shrublands are either naturally formed or established by human activity.



Vegetation in World :

Epiphytes are usually found in the **temperate** zone (e.g., many mosses, liverworts, lichens, and algae) or in the **tropics** (e.g., many ferns, cacti, orchids, and bromeliads). Epiphyte species make good houseplants due to their minimal water and soil requirements.

Acacia (genus Acacia), genus of about 160 species of trees and shrubs in the pea family (Fabaceae). Acacias are native to tropical and subtropical(aka temperate) regions of the world, particularly **Australia** (where they are called wattles) and **Africa**, where they are well-known landmarks on the **veld** and **savanna**.

Baobab is a genus of **deciduous** trees known as **adansonia**. They are found in **arid** regions of ***Madagascar, mainland Africa, Arabia, and Australia***.

Cedar tree is native to the Himalayas and countries around **Mediterranean**. A **Cedar** is an evergreen tree (meaning it has leaves all year round) with a distinctive, spicy scent. Cedar family of trees (Cedrus genus) includes four species (**Deodar** cedar, Atlas cedar, Cyprus cedar and Lebanon cedar).

Vegetation type	Found in
Epiphytes	Tropics , Equatorial
Acacia	
Baobab	
Cedar	Himalayas , **Mediterranean**

MIXED Cropping :

- It is the *process of growing two or more crops together in the same piece of land simultaneously*.
- The **cereals** are usually mixed with legumes viz. Jowar or Bajara mixed with Tur, udid, Mung, matki or kulthi.
- **Wheat** is mixed with peas, gram or mustard;
- **Cotton** is grown mixed with Tur or sunflower.
- The objectives are:
    - To get handy installments of cash returns especially in irrigated crops,
    - To achieve better distribution of labour throughout the year,
    - To utilize available space & nutrients to maximum extent possible,
    - To safe guard against hazards of weather, diseases & pests,
    - To secure daily requirements like pulses, oilseeds, fibers, etc.
    - To get balanced cattle feed.

Mineral Belt	Location	Minerals found
North Eastern Peninsular Belt	Chota Nagpur plateau and the Orissa plateau covering the states of Jharkhand, West Bengal and Orissa.	Coal, iron ore, manganese, mica, bauxite, copper, kyanite, chromite, beryl, apatite etc. Khullar calls this region the *mineral heartland of India* and further cites studies to state that: 'this region possesses India's 100 percent Kyanite, 93 percent iron ore, 84 percent coal, 70 percent chromite, 70 percent mica, 50 percent fire clay, 45 percent asbestos, 45 percent china clay, 20 percent limestone and 10 percent manganese.'
Central Belt	Chhattisgarh, Andhra Pradesh, Madhya Pradesh and Maharashtra.	Manganese, bauxite, uranium, limestone, marble, coal, gems, mica, graphite etc. exist in large quantities and the net extent of the minerals of the region is yet to be assessed. This is the second largest belt of minerals in the country.
Southern Belt	Karnataka plateau and Tamil Nadu.	Ferrous minerals and bauxite. Low diversity.
South Western Belt	Karnataka and Goa.	Iron ore, garnet and clay.
North Western Belt	Rajasthan and Gujarat along the Aravali Range.	Non-ferrous minerals, uranium, mica, beryllium, aquamarine, petroleum, gypsum and emerald.