

[9:18 AM] Brief Recap

[9:27 AM] RIVERS OF PENINSULAR INDIA:

The East Flowing Rivers:

- **Subarnarekha River:** (originates through Chota Nagpur Plateau and flows through Jharkhand and flows along the border of Odisha and WB)
 - Originates in Jharkhand
 - Known for Gold placer deposits
 - **Baitarni and Brahmani Rivers:**
 - Independently drains into the Bay of Bengal
 - Along with Mahanadi, they form Delta in Odisha.
 - Famous for **Gahirmata National Park** - Mass nesting (Arribada) of **Olive Ridley** turtles
 - **Mahanadi River:** (forms delta in Odisha)
 - Originating from Dandakaranaya plains of Chhattisgarh
 - Dam - **Hirakud Dam**, the largest **earthen Dam**. (The reservoir of Hirakud was recently declared a Ramsar Site).
↳ i.e. it have materials of earth like stones, mud etc. and this is too much large like we can make a 8m wide road from Kashmir to Kanyakumari.
 - **Vamsdhara River:**
 - Disputed river, interstate river, between Andhra Pradesh and Odisha
 - **Godavari River:** (flows through Maharashtra, Telangana and AP and called as Dakshin Ganga because it is the largest river of Peninsular region)
 - Originates from Triambakeshwar Nashik,
 - Aka **Dakshin Ganga**
 - Godavari doesn't have many right bank tributary
 - Right Bank tributary - **Manjra** (which flows through Karnataka)
 - Left Bank tributaries - Wainganga, Penganga, Wardha (these three merge in **Pranhita** which joins Godavari), **Indravati** (**Naigra** of India, **Chitrakoot Waterfalls**), Sabari
- come from Odisha then Chattisgarh and joins in Telangana.
- largest waterfall present in Canada.
- name of river after joining all three rivers.

- **Krishna River:**
 - Originates from Mahabaleshwar in Maharashtra
 - Left Bank Tributaries - Bhima, Musi (flows through Hyderabad)
 - Right Bank Tributaries - **Koyna** (Known for reservoir-induced seismicity), Ghataprabha, **Malaprabha** (known for Vesara Temple Architecture, Badami, Aihole, Pattadakal), **Tungabhadra** (joins Krishna in Andhra Pradesh, Vijayanagar Empire, Hampi),
(these are two rivers Tunga and Bhadra which joins and forms Tungabhadra which joins Krishna in AP)
 - Krishna River is the natural border between Telangana and Andhra Pradesh
- **Penneru River:**
 - Originates from Nandi hills, it flows through Andhra Pradesh cuts Nalamala hills, and enters the Bay of Bengal
 - Forms a deep and wide Canyon known as the Grand Canyon of India - **Gandikota Canyon**
- **Palar River:**
 - It also originated from Nandi hills
- **Cauvery/Kaveri River:** (most disputed river of India bw Karnataka and Tamil Nadu)
 - Originates from Talakavery in Brahmagiri Hills in Coorg Hills
 - Delta of Cauvery is known as Point Calimere
 - Left Bank Tributaries - Harangi, Hemwati, Arkavati, Shimsha
 - Right Bank Tributaries - **Kabini**, Bhawani, Amravati
 - **Vaighai River:**
 - From the western ghats flows through the southern part of Tamil Nadu and drains in the Gulf of Mannar near Rameshwaram
 - Flows through **Madurai**, **Sangam** happened on its Bank

originates from Maharashtra and due to a dam on it, it is known for reservoir-induced seismicity.

it is imp. and comes from Kerala and joins Kaveri in Karnataka.

[10:01 AM] The West Flowing Rivers:

- **Luni River:**
 - Flowing through Rajasthan Drains into the Rann of Kutch (**inland drainage**)
- **Sabarmati River:**
 - Flows through Gandhinagar
- **Mahi River:**
 - Originates from Vindhya
 - Crosses the tropic of cancer twice
 - Drains into the Gulf of Khambat
- **Narmada River:**
 - Originates from Amarkantak
- **Tapi River:**
 - Originates from Betul Plateau
- **Mahadai/Mandovi River:**
 - Disputed between Karnataka and Goa
 - In Karnataka it is known as Mahadai and in Goa it is known as Mandovi
 - Famous for **Doodhsagar** waterfalls
- **Sharavati River:**
 - Karnataka is famous for **India's highest waterfall Jog Falls**
- **Kerala:**
 - Periyar river: known for Mullaperiyar Dam (located inside Kerala but operated by Tamil Nadu)
 - Pamba river: flows near to Sabarimala Temple

[10:17 AM] CLIMATE OF INDIA: [Imp. w.r.t. to mains](#)

- **Factors Affecting India's Climate:**

- India's climate is classified as **Tropical Monsoon Climate**,
- The

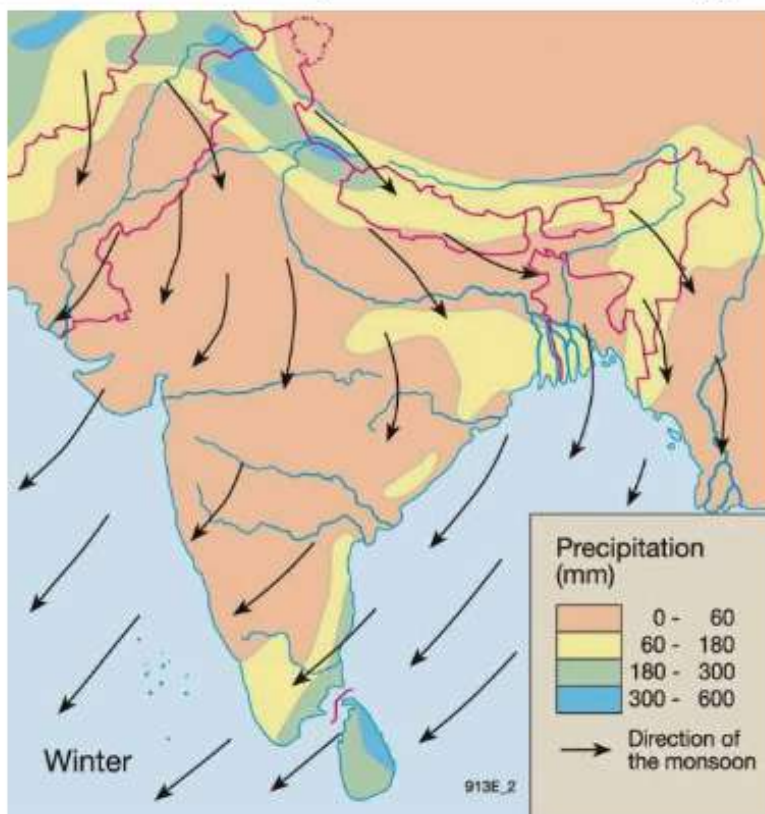
following factors

influence the climatic conditions of India:

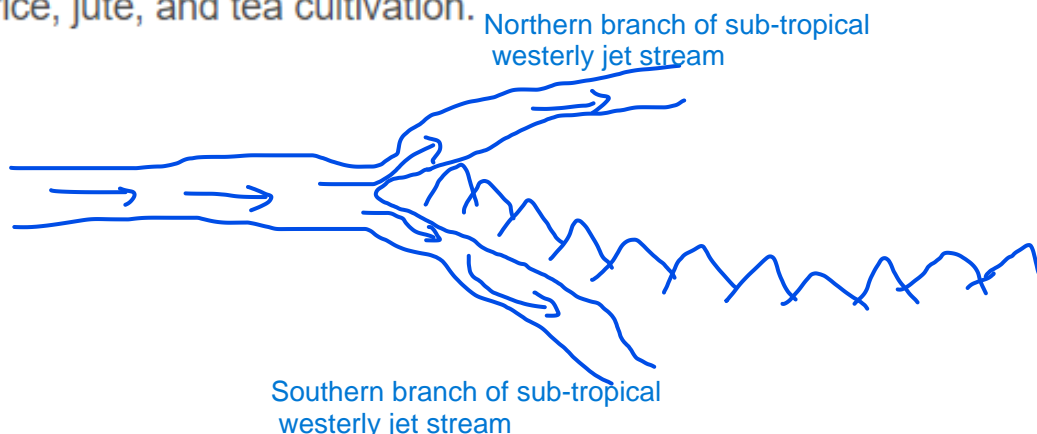
1. **The latitudinal Extent** - of nearly 30 degrees causes climatic conditions to vary from tropical to sub-tropical across different parts.
2. **Location** - near to Indian Ocean results in moderating effect of the water body.
3. **The presence of the Himalayas** - protects India from the cold and dry winds of central Asia during winters.
4. **Monsoon Winds** - are the most dominant factor due to which it is called a monsoon climate.
5. **Topographical features** - such as the **Western Ghats** being perpendicular to the monsoon winds causing heavy rain along the west and **rainshadow along the east**. **Aravalis being parallel to Monsoon winds** causes less rainfall in Rajasthan.
6. **Jet Streams** - the sub-tropical westerly jet stream, tropical easterly jet stream, and Somali jet streams impact both summer as well winter weather conditions.
7. **Cyclones** - the coastal states along the East Coast are largely impacted by tropical cyclones
8. **El-Nino, La-Nina, MJO, and IOD** - causes variations in Indian rainfall

[10:57 AM] ORIGIN AND MECHANISM OF MONSOON:

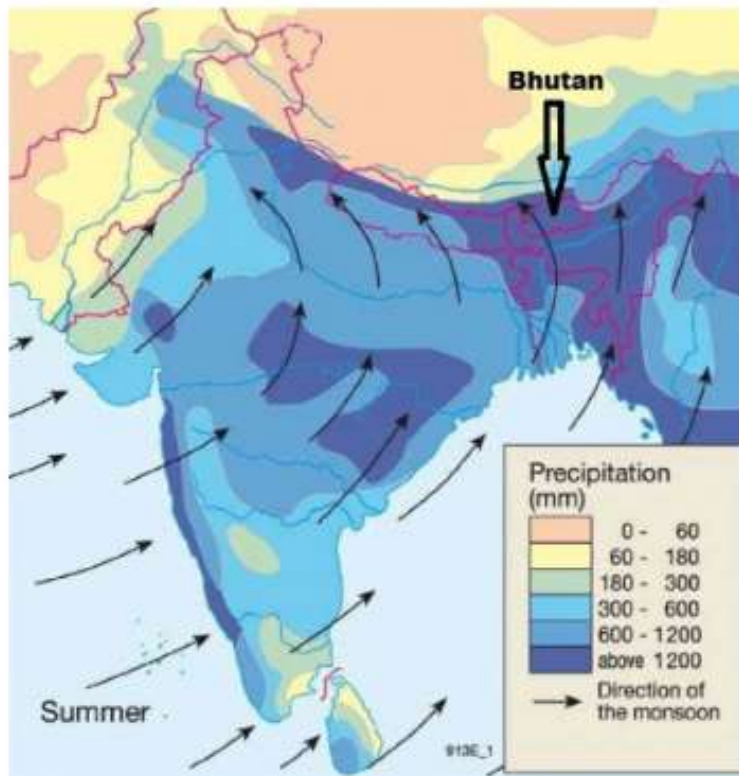
- The word Monsoon is derived from the Arabic word "**Mausam**" which means season.
- **Classical Theory:**
- It explains the phenomenon of Monsoons as **large-scale land and sea breezes** because of the reversal of temperature and pressure conditions in the northern plains from summer to winter.
- During summers, high temperature and low pressure attracts winds from the Arabian Sea,
- During winters, low temperature and high pressure causes winds to move from land towards the sea
- **Modern Theory:**
- **Winter Conditions (November to February):**



- The northern plains are experiencing low temperature, and high pressure conditions **causing surface divergence**.
- The sky is clear, the air is dry and cold. because it is along 30degree latitude and in winter temperature between Hadley and Ferrel cell is much enough.
- The **sub-tropical westerly jet stream** is strong and **well-established**. ↓
- It is bifurcated into **two parts** bz of mountains towards the North and South of the Tibetan plateau.
- The southern branch is stronger and is **established along the Northern Ganga Plains**.
- This intensifies **surface anti-cyclonic circulations** leading to clear and dry sky weather.
- This results in winds blowing from land to sea from the northeast direction called **NE Monsoon winds**.
- These NE winds after crossing the Bay of Bengal, pick up the moisture and cause **precipitation along the Coromandel Coast**.
- **Spring Conditions (February to May):**
- With the temperature rise, the weather is hot and dry.
- The sub-tropical westerly jet stream begins to weaken and the **southern branch eventually moves entirely to the north** beyond the Tibetan Plateau.
- The temperature continues to rise and the pressure drops.
- This **results in convection and precipitation** in some regions called **pre-monsoon showers**, eg. mango showers of Kerala, Cherry blossom of Karnataka, Kal Baisakhi, Norwester, or Bardoli Cherra in Jharkhand, Odisha, West Bengal, and Assam.
- It is helpful for rice, jute, and tea cultivation.



- [10:45 AM] Summer Conditions (May to August):



- Complete development of **low-pressure cells** over the desert and northern plains.
- ITCZ shifts completely towards the north of the equator and is lying over the northern plains as the **monsoon trough**.
- This attracts the **southern trade winds** towards the north of the equator, which after **crossing the equator turns right** under the influence of the **Coriolis Force** and flows as **Southwest monsoon winds**.

- **Temperature stratification of air** does not allow upliftment of air on a large scale preventing major storms.
- The **tropical easterly jet stream** is a low-level jet stream developed only in summers over South Asia and Africa. It causes the change of divergence to convergence on the surface.
- In addition to this, **monsoon depressions** in the Bay of Bengal also help in triggering large-scale convection.
- This results in the **bursting of the monsoon** which is the sudden onset of moisture-laden winds associated with **violent thunder and lightning**.
- These monsoon winds gradually get distributed throughout India resulting in monsoon rainfall.
- In some regions, a **break in monsoon** appears due to **local stability** conditions and also **due to the winds blowing parallel** to the topography.
- **Somali jet stream** along the coast of Somalia strengthens high pressure at Madagascar. This High pressure cell causes the faster flow of winds toward India
- **Autumn (September - October):**
- The **ITCZ started to move back gradually** towards the south. This also brings back the maximum extent up to which southwest winds blow.
- The southwest winds slowly get replaced by the northeast trade winds.
- The **subtropical jet stream starts to reappear** to the south of the Tibetan plateau creating dry conditions.
- The High temperature with dry conditions in October along the northern plains is called as **"October Heat"**.

NEXT CLASS TOPICS - CHARACTERISTICS OF MONSOON, DISTRIBUTION, WESTERN DISTURBANCES, ETC.





