

Mechanism of Indian Monsoon

The climate of India is described as the ‘**monsoon**’ type. In Asia, this type of climate is found mainly in the south and the southeast.

Out of a total of 4 seasonal divisions of India, monsoon occupy 2 divisions, namely.

- **The southwest monsoon season** - Rainfall received from the southwest monsoons is seasonal in character, which occurs between June and September.
- **The retreating monsoon season** - The months of October and November are known for retreating monsoons.

Mechanism:

Onset of the South-West Monsoon

- ❖ The location of **ITCZ shifts north and south of the equator** with the apparent movement of the Sun.
- ❖ During the month of June, the **sun shines vertically over the Tropic of Cancer** and the **ITCZ shifts northwards**.
- ❖ The southeast trade winds of the southern hemisphere cross the equator and start blowing in southwest to northeast direction under the influence of **Coriolis force**.
- ❖ These winds collect moisture as they travel over the warm Indian Ocean.
- ❖ In the month of July, the **ITCZ shifts to 20°-25° N latitude and is located in the Indo-Gangetic Plain** and the south-west monsoons blow from the Arabian Sea and the Bay of Bengal. The ITCZ in this position is often called the **Monsoon Trough**.
- ❖ The shift in the position of the ITCZ is also related to the phenomenon of the withdrawal of the westerly jet stream from its position over the north Indian plain, south of the Himalayas.
- ❖ The easterly Jet Stream (Somali Jet) sets in along 15°N latitude only after the western jet stream has withdrawn itself from the region. This easterly jet stream is held responsible for the burst of the monsoon in India.
- ❖ As these winds approach the land, their southwesterly direction is modified by the relief and thermal low pressure over northwest India. The monsoon approaches the Indian landmass in two branches:
 - ❖ **The Arabian Sea branch** - The monsoon winds originating over the Arabian Sea.
 - ❖ **The Bay of Bengal branch** - The Arakan Hills along the coast of Myanmar deflect a big portion of this branch towards the Indian subcontinent. The monsoon, therefore, enters West Bengal and Bangladesh from south and southeast instead of from the south-westerly direction.
- ❖ Another phenomenon associated with the monsoon is its tendency to have ‘**breaks**’ in rainfall. The monsoon rains take place only for a few days at a time. They are

interspersed with rainless intervals. **These breaks in monsoon are related to the movement of the monsoon trough.**

Despite an overall unity in the general pattern, there are perceptible regional variations in climatic conditions within the country.

Retreating Monsoon Season:

- ❖ The retreating southwest monsoon season is **marked by clear skies and rise in temperature.**
- ❖ The land is still moist. Owing to the conditions of high temperature and humidity, the weather becomes rather oppressive. This is commonly known as the **‘October heat’.**
- ❖ In the second half of October, the mercury begins to fall rapidly, particularly in northern India.
- ❖ The weather in the retreating monsoon is **dry in north India** but it is associated with **rain in the eastern part of the Peninsula.** Here, October and November are the rainiest months of the year.
- ❖ The widespread rain in this season is associated with the passage of cyclonic depressions which originate over the Andaman Sea and manage to cross the eastern coast of the southern Peninsula. These tropical cyclones are very destructive.
- ❖ A bulk of the rainfall of the Coromandel Coast is derived from these depressions and cyclones.
- ❖ Unlike the rest of the country, which receives rain in the southwest monsoon season between June and September, the **northeast monsoon is crucial for farming and water security in the south.**

Impact of Monsoons on Life in India

Positive

- About 64% of people in India depend on agriculture for their livelihood and agriculture itself is based on monsoon.
- Agricultural prosperity of India depends very much on timely and adequately distributed rainfall. If it fails, agriculture is adversely affected particularly in those regions where means of irrigation are not developed.
- Regional variations in monsoon climate help in growing various types of crops.
- Regional monsoon variation in India is reflected in the vast variety of food, clothes and house types.
- Monsoon rain **helps recharge dams and reservoirs**, which is further used for the **generation of hydro-electric power.**

- Winter rainfall by temperate cyclones in north India is highly beneficial for Rabi crops.

Negative

- Variability of rainfall brings **droughts or floods** every year in some parts of the country.
- Sudden monsoon burst creates a problem of **soil erosion** over large areas in India.
- In hilly areas sudden rainfall brings **landslide** which **damages natural and physical infrastructure** subsequently **disrupting human life economically** as well as **socially**.