

◆ Definition Box

- Weather: Atmospheric conditions at a particular time and place (short-term).
- Climate: Long-term average of weather conditions over a large area (typically 30+ years).
- Elements of Weather/Climate: Temperature, Pressure, Wind, Humidity, Precipitation

◆ India's Climate Type

■ Monsoon Type Climate

- Found mainly in South and Southeast Asia
- Seasonal reversal of wind direction
- Regional variation due to latitude, altitude, relief, ocean currents, etc.



Fig 4.1 – Advancing Monsoon



Fig 4.2 – Retreating Monsoon

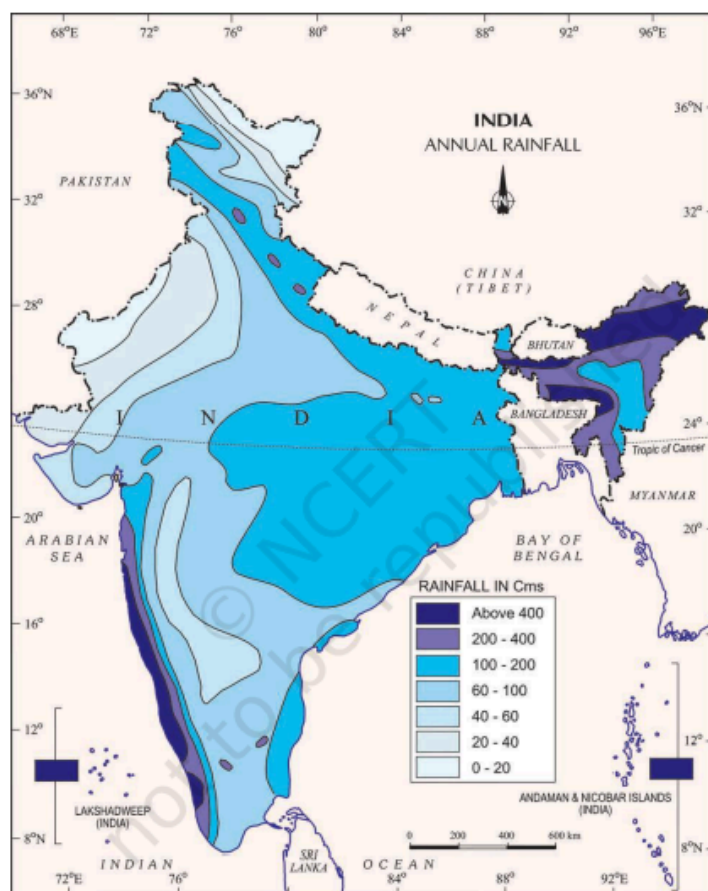


Fig 4.3 – Rainfall Distribution Map

◆ Factors Affecting India's Climate

📍 1. Latitude

- Tropic of Cancer ($23\frac{1}{2}^{\circ}\text{N}$) divides country into tropical & subtropical zones
- South India = more tropical → warmer
- North India = more seasonal contrast

🏔️ 2. Altitude

- Himalayas (avg. height ~6000 m) prevent cold winds
- Coastal areas = low elevation → warmer
- Hilly regions = cooler climate

🌬️ 3. Pressure and Wind System

Includes:

- Surface winds
- Upper air circulation (Jet streams)
- Western cyclonic disturbances
- Tropical cyclones

🌍 4. Distance from Sea (Continentality)

- Coastal areas (e.g., Mumbai) = equable climate
- Interiors (e.g., Delhi) = extreme heat/cold

🌊 5. Ocean Currents

- Warm/cold currents influence coastal climate
- e.g., Kerala coast is warm due to warm currents

🏞️ 6. Relief

- High mountains block winds and cause rain on windward side
- Leeward side = dry (rain shadow zone)

📖 Coriolis Force: Caused by Earth's rotation; deflects winds → right in northern hemisphere.

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◆ The Four Seasons in India

🌨️ 1. Cold Weather Season (Mid-Nov to Feb)

- Cool, dry weather
- Clear skies, low temp, low humidity
- North India → frost and snowfall in higher altitudes
- North-east trade winds dominate
- Western Disturbances bring rain to north (important for rabi crops)

🔥 2. Hot Weather Season (March to May)

- Rising temperature, falling air pressure
- NW India → 45°C (Delhi, Rajasthan)

- Loo: hot, dry winds in northern India (fatal)
- Local storms:
 - Kaal Baisakhi (Bengal) – violent thunderstorms
 - Mango Showers (Kerala/Karnataka) – help in early ripening of mangoes

3. Advancing Monsoon (June to Sept)

- Low-pressure over north pulls in SE trade winds
→ Cross equator → become South-West Monsoon
- High rainfall along Western Ghats & NE India (e.g., Mawsynram = highest in world)
- Ganga plains: rainfall decreases from east (WB) to west (Punjab)

Monsoon Breaks:

- Rainless intervals between rain spells
- Caused by north-south shifts of monsoon trough



 Tropical Depressions (from Bay of Bengal) influence rainfall pattern & intensity.

4. Retreating Monsoon (Oct to Nov)

- Monsoon withdraws gradually
- Clear skies, humid 'October Heat'
- Cyclones form in Bay of Bengal → heavy rain on east coast (esp. TN, Odisha)
- TN gets rain during this time (Northeast Monsoon)

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◆ Distribution of Rainfall

-  High Rainfall (>400 cm): Western coast, Meghalaya
-  Low Rainfall (<60 cm): Western Rajasthan, Gujarat, interior Deccan, Leh

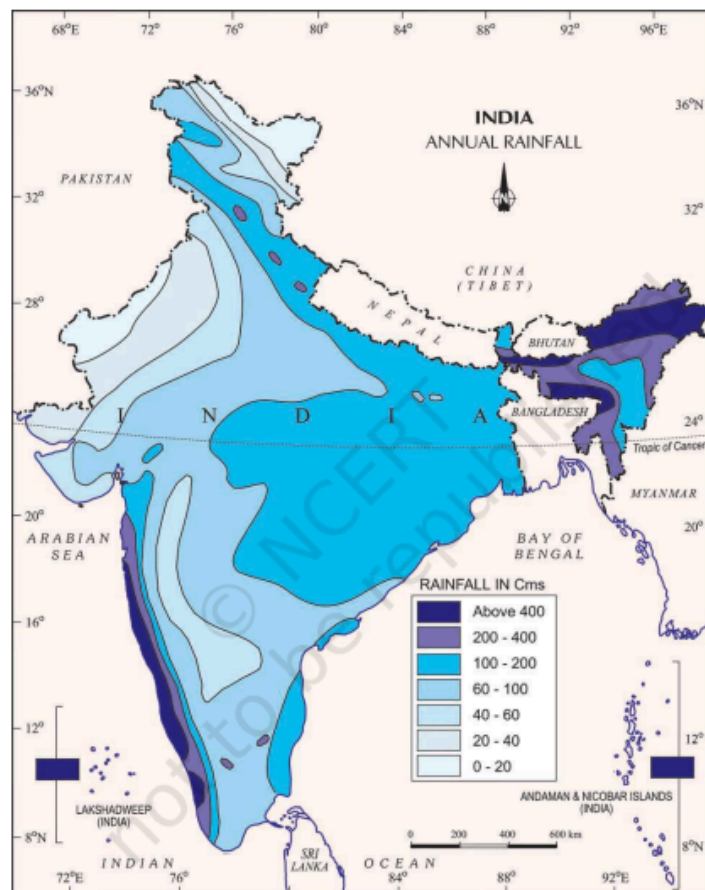


Fig 4.3 – Rainfall Distribution Map

Note:

- East India gets more rainfall than West
- Snowfall limited to Himalayas
- Floods & droughts common due to variability

◆ Monsoon as a Unifying Bond

Despite diversity, monsoon connects the whole country:

- Sets agriculture cycle in motion
- Influences festivals, food, clothing, lifestyle
- Himalayan barrier & ocean surroundings control climate
- Despite uncertainty, people eagerly await its arrival

Even places like Thiruvananthapuram (9 months rain) & Delhi/Jodhpur (3 months rain) are bound by it!

Summary Table

Season	Months	Key Features
Cold Weather	Nov–Feb	Cool, dry, western disturbances, frost in North
Hot Weather	Mar–May	High temp, loo, mango showers, dust storms
Advancing Monsoon	Jun–Sept	SW winds, heavy rainfall, floods, tropical depressions
Retreating Monsoon	Oct–Nov	Withdrawing winds, cyclones on east coast, TN rainfall

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Map Work:

- Rainfall > 400 cm: Western Ghats, NE states
- Rainfall < 20 cm: Rajasthan, Leh
- SW Monsoon Flow Direction: From Arabian Sea & Bay of Bengal → Inland