INDIA'S CLIMATE

India's climate is predominantly of the monsoon type, i.e. climate associated with seasonal reversal of winds.

FACTORS DETERMINING INDIA'S CLIMATE

The factors determining India's climate are classified into two categories:

1. Factors related to location and relief

- **Latitude:** India is located partially in the tropical region and partially in the temperate region, as the Tropic of Cancer passes through the central part of India. The southern parts, being closer to the equator, experience high temperature throughout the year. The northern parts are distant from the equator and thus experience comparatively lower temperatures, particularly in winters. The monthly average temperatures of the warmest and the coldest months in North India are 32°C and 21°C, respectively. However, the monthly average temperatures of the warmest and the coldest months in South India are 33°C and 26°C, respectively.
- **Himalayas:** They act as a barrier for bitterly cold and dry winds coming from Central Asia and the Siberian region. They also limit the northward journey of the rain-bearing south-west monsoon winds, forcing them to shed their moisture in the Indian Subcontinent. Thus, the Himalayas act as a climatic division between the Indian Subcontinent and Central Asia.
- **Distribution of land and water:** As compared to landmass, water heats up or cools down slowly. This causes differential heating of land and sea. The differential heating causes seasonal reversal of winds. On account of seasonal reversal, India experiences south-west monsoon during summers and north-east monsoon during winters.
- **Distance from sea:** Southern or Peninsular India is surrounded by the Arabian Sea, the Indian Ocean, and the Bay of Bengal. The climate of coastal regions of India is equable or maritime. Contrary to this, the regions located in the interior of the country are cut off from the oceanic influence. As a result, they have an extreme or continental type of climate. Thus, the areas in South India, in comparison to the areas in North India, experience lower annual range and daily range of temperature.
- **Altitude:** We have read earlier that temperature decreases with increase in altitude. Temperature of air increases when it comes into contact with warm landmass.
- **Relief:** The windward sides of mountains receive high rainfall, while their leeward sides remain dry.

2. Factors related to air pressure and winds

- Lower air circulation or monsoon (Seasonal reversal of winds): The complete reversal in the direction of winds over India brings about a change in seasons. These

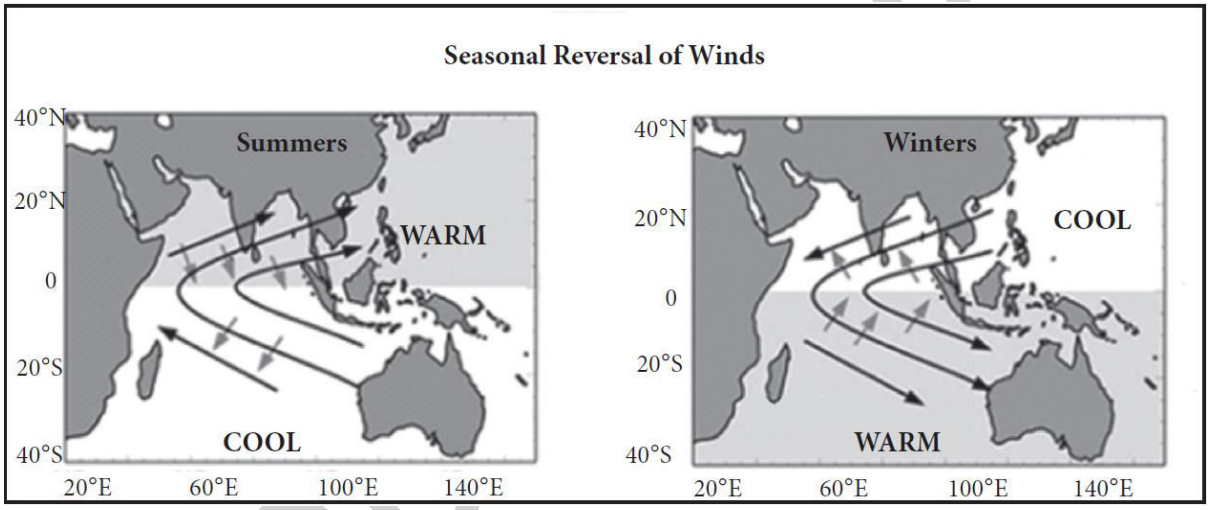
winds that change their direction with the change in seasons are called monsoon winds. The word "monsoon" is derived from the Arabic word "Mousim", which means "season". These winds have such a far-reaching influence on India's climate that India's climate is termed "monsoon type of climate".

- Upper air circulation or jet streams (Details later in this chapter)

INDIAN MONSOON: MECHANISM AND ONSET

South-west Monsoon

During summers in the northern hemisphere, the inter-tropical convergence zone (ITCZ) shifts northwards from the equator to Indian landmass. The South-East Trade Winds in the southern hemisphere, under the impact of intense low pressure, cross over the equator and enter the northern hemisphere. The South-East Trade Winds turn towards their right due to the Coriolis force caused by the rotation of the Earth. Thus, the South-East Trade Winds become South-West Trade Winds.



Remember, winds blow from high-pressure to low-pressure areas! Winds deflect towards their right in the northern hemisphere and towards their left in the southern hemisphere.

During summers, the low-pressure belt shifts northwards over the North Indian Plains. On the other hand, the waterbody adjoining the Indian peninsula has comparatively high pressure. This leads to wind movement from the sea to the land. As these winds originate from south-west direction, they are known as south-west monsoon.

These south-west winds gather moisture over the sea and bring rainfall in the Indian Subcontinent. These winds (monsoon) touch the coast of Kerala on 1 June and cover entire Indian landmass by 15 July.

These winds bifurcate into two branches:

1. Arabian Sea branch: It blows over Arabian Sea and enters Indian landmass. It is further divided into the following:

- **First branch:** It is obstructed by the Western Ghats. The windward side of the Western Ghats receives heavy rainfall. After crossing the Western Ghats, this branch descends downwards and gets heated up, causing little rainfall in the rain shadow area.
- **Second branch:** It strikes the coast of Maharashtra and moves along the river valley of Narmada and Tapi. These winds cause rainfall in Central India.
- **Third branch:** It enters from the coast of Gujarat and leads to rainfall in entire Gujarat. This branch also causes scanty rainfall in western Rajasthan while moving along the Aravallis.

2. Bay of Bengal branch: It gathers moisture from the Bay of Bengal and strikes Myanmar and southeast Bangladesh. However, Arakan Yoma Hills (Myanmar) deflect this branch towards Indian Subcontinent. This branch, thus, enters North East India and West Bengal from the south and southeast directions instead of the south-west direction.

This branch, after coming into contact with the Himalayas, further splits into the following:

- The **first branch** moves westwards along the Ganga Plains, covering the whole of North India.
- The **second branch** moves up from the Brahmaputra Valley in North East India, causing widespread rains. Its sub-branch strikes the Garo and Khasi Hills of Meghalaya. The trapped clouds pour heavy rainfall, making Mawsynram and Cherrapunji the wettest places in the world.

During summers, the Tamil Nadu coast remains dry on account of the following reasons:

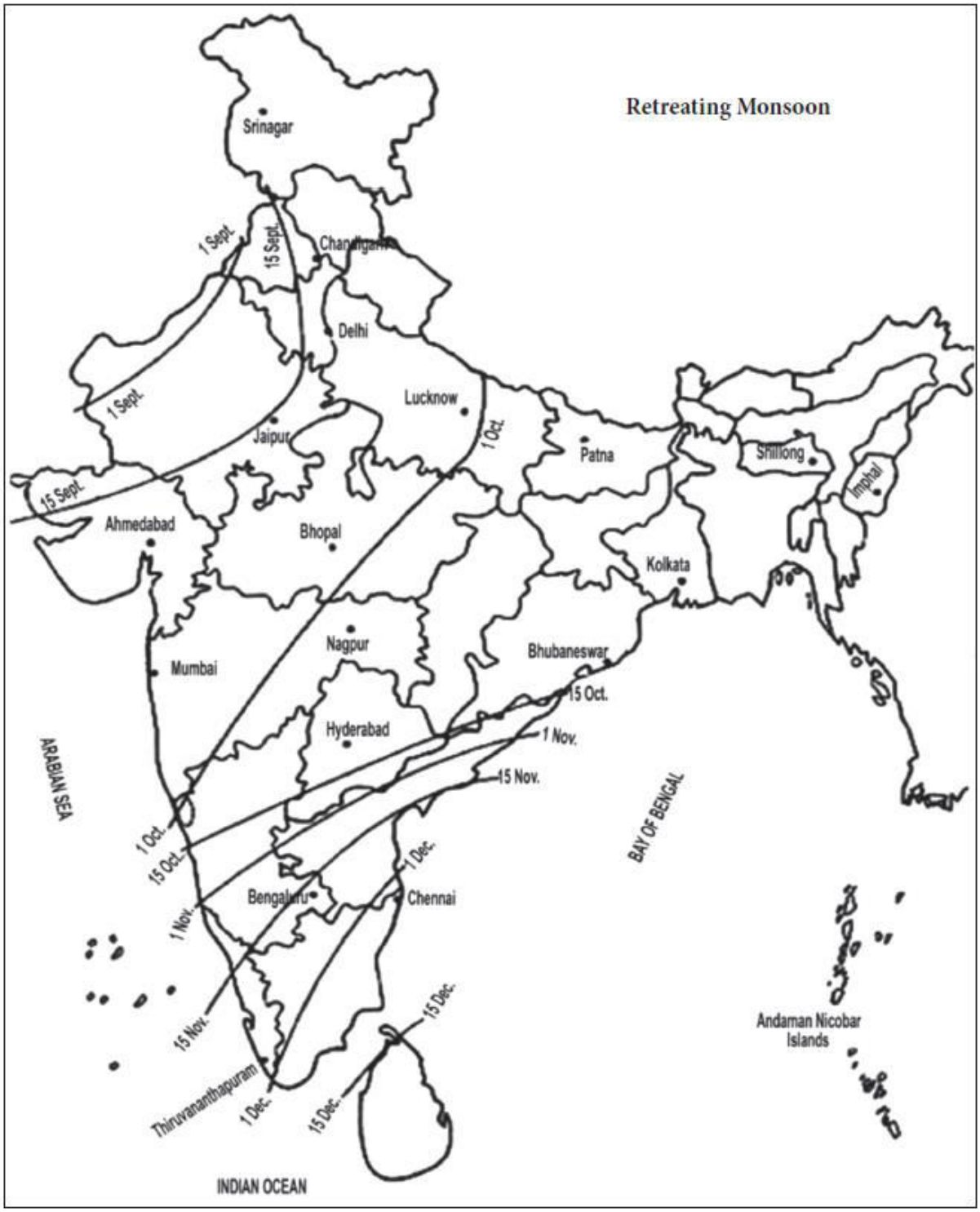
- The rain-bearing Bay of Bengal branch moves parallel to the Tamil Nadu coast. As a result, Tamil Nadu does not receive rainfall from the Bay of Bengal branch during summers.
- Also the Western Ghats block the extension of the Arabian Sea branch. Therefore, during summers, Tamil Nadu coast remains in the rain shadow region.

North-East Monsoon (Season of Retreating Monsoon)

During summers in the southern hemisphere (winters in the northern hemisphere), the ITCZ shifts southwards. As a result, a high-pressure belt emerges over land and a low-pressure belt emerges over sea. The winds start blowing from land to sea. These winds

blow from the north-east direction and are thus called the north-east monsoon winds. As the north-east winds blow from land, these winds are dry.

The north-east monsoon winds are also regarded as retreat of monsoon. These winds blow in the opposite direction of the south-west monsoon winds.



North-east monsoon starts retreating from western Rajasthan by the first week of September. By mid-December, the monsoon completely withdraws from the mainland.

The weather becomes dry across India. However, during the retreat of monsoon, Tamil Nadu coast receives rainfall.

The Tamil Nadu coast receives rainfall because retreating winds pass over the Bay of Bengal and gather moisture. When these winds reach the coast of Tamil Nadu, these winds cause rainfall.

Upper Air Circulation or Jet Streams

Jet streams are the winds blowing in the upper atmosphere at a height of 8–13 km. Two jet streams affect India's climate:

1. Westerly jet stream: During winters, a westerly jet stream blows from west to east at a very high speed over the subtropical zone. This jet stream is bifurcated by the Himalayan ranges. The northern branch of this jet stream blows along the northern edge of the Himalayan ranges. The southern branch blows to the south of the Himalayan ranges along 25°N latitude.

It is believed that this branch of jet stream exercises a significant influence on the winter weather conditions over India. This jet stream is responsible for bringing Western Disturbances from the Mediterranean region into the Indian Subcontinent. Western Disturbances are extra-tropical storms originating in the Mediterranean region, which brings sudden winter rain to the northwestern parts of the Indian Subcontinent. Winter rains are non-monsoon precipitation driven by the westerly jet stream.

These Western Disturbances bring winter rain, providing much needed moisture for winter crops, hail storms in north-western plains, and occasional heavy snowfall in hilly regions. The amount of rainfall brought by Western Disturbances reduces from west to east and from north to south.

2. Easterly jet stream: The easterly jet stream affects the peninsular region of India during summer months. During summers, due to the apparent shift of the Sun in the northern hemisphere, the reversal in the upper air circulation takes place. The westerly stream is replaced by the easterly jet stream.

The easterly jet stream steers the cyclonic depressions into India. The cyclonic depressions brought by the easterly jet stream cause rainfall in Peninsular India.

LOCAL WINDS

- **Loo:** During summers, dry and hot winds blow in the ITCZ belt over northern plains. These winds are called "loo". Loo brings temporary relief from hot weather as these winds may bring light rains and even cool breeze. Loo takes place before the emergence of monsoon.

- **Mango showers:** Mango showers, or "mango rains", is a term used to describe the occurrence of pre-monsoon rainfall. Sometimes these rains are called "summer showers" or "pre-monsoon showers". These rains normally occur from March, although their arrival is often difficult to predict. Their intensity can range from light showers to heavy and persistent thunderstorms.
  Pre-monsoon showers are common especially in Kerala, Karnataka, and parts of Tamil Nadu in India. They help in the early ripening of mangoes and are thus called "mango showers".
- **Norwesters:** These are dreadful evening thunderstorms in Bengal and Assam. Norwesters cause destruction but are useful for tea, jute, and rice cultivation. They are locally called "Kal Baisakhi" on account of their ability to bring destruction in the month of Baisakh.
- **Blossom showers:** Blossom showers is a term used to describe the occurrence of premonsoon rainfall. Blossom showers facilitate the growth of coffee in the coastal region of Kerala and Karnataka.

RAINFALL: REGIONAL DISTRIBUTION

The annual average rainfall of India from the South-West Monsoon (June to September) is 89 cm over a long period average (LPA). LPA is calculated in India as the average of rainfall over a period of 50 years from 1951 to 2000. According to the Indian Meteorological Department, normal monsoon is within the range of 89 cm plus/minus 4%.

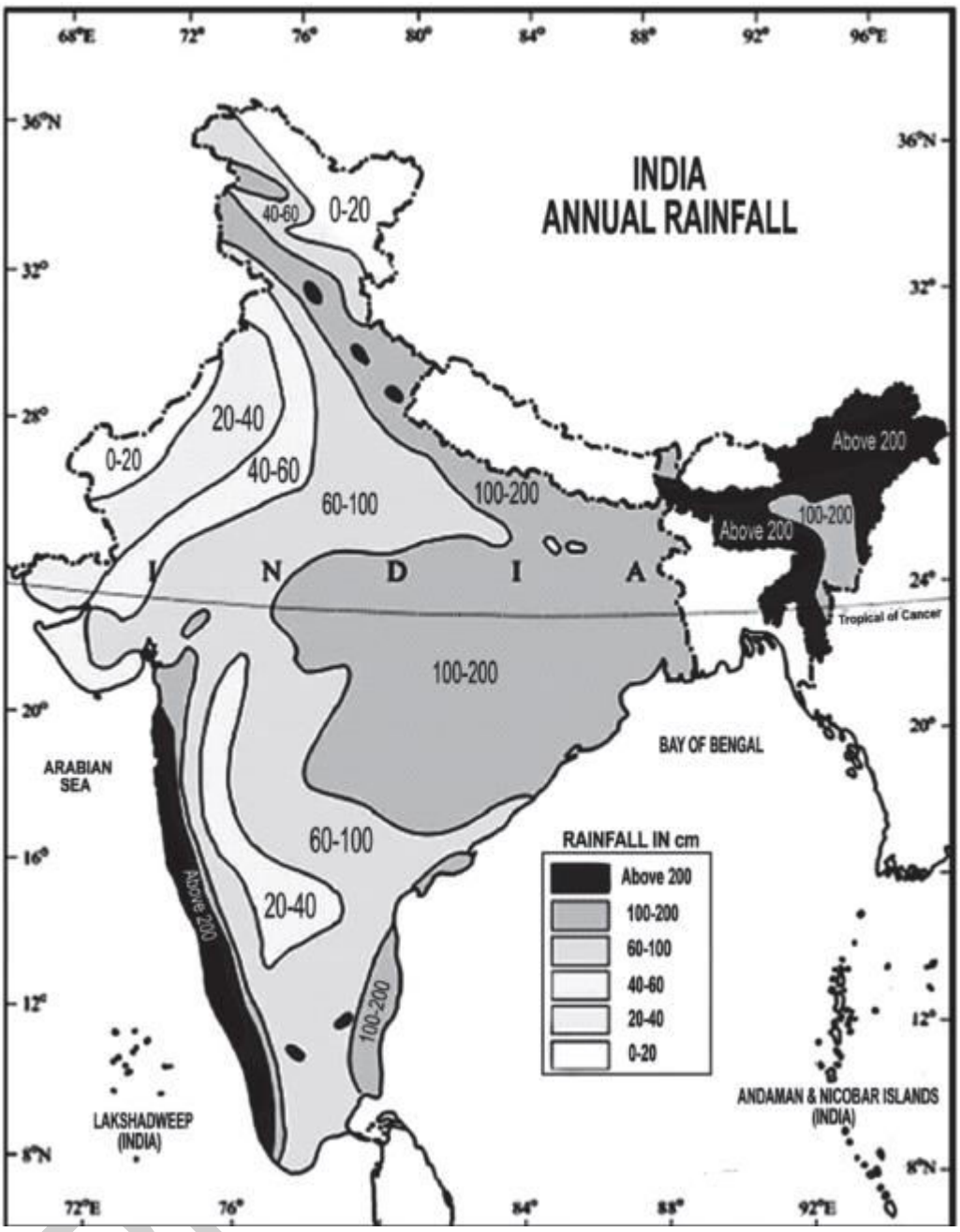
However, the average rainfall in India for the whole year is 118 cm and standard deviation is 9 cm (about 10% of mean value).

IMD maintains five rainfall distribution categories on an all-India scale. These are:

- **Normal or Near Normal:** When per cent departure of actual rainfall is +/-10% of LPA, that is, between 96-104% of LPA
- **Below normal:** When departure of actual rainfall is less than 10% of LPA, that is 90-96% of LPA
- **Above normal:** When actual rainfall is 104-110% of LPA
- **Deficient:** When departure of actual rainfall is less than 90% of LPA
- **Excess:** When departure of actual rainfall is more than 110% of LPA

The amount of rainfall varies significantly in different regions within India. The rainfall pattern is influenced mainly on account of the following factors:

- Pressure belts
- Physical features
- The moisture carried by winds reduces from south to north and from east to west.



1. Areas of high rainfall (200 cm or above per year)

- Windward sides of Western Ghats.
- Majority of north-east, except parts of Assam, Manipur, and Mizoram.
- Meghalaya hills (extremely high rainfall, above 400 cm). Mawsynram and Cherrapunji are the wettest places in the world. These places receive an annual average rainfall of nearly 1100 cm.

Break in Monsoon

The regions along the west coast, south of Goa, do not receive rainfall for a continuous period of 3–4 weeks during the monsoon. This phenomenon is called

"break in the monsoon". Break in the monsoon occurs during the middle of August.
It occurs because during the month of August, moisture-bearing south-west monsoon moves parallel to the west coast. Moreover, a low-pressure belt emerges over North India. As a result, moisture-bearing winds move towards North India.

2. Medium rainfall (100–200 cm)
- Parts of southern Gujarat
- Eastern Tamil Nadu
- Odisha
- Jharkhand
- Bihar
- Madhya Pradesh
- Eastern Uttar Pradesh
- West Bengal

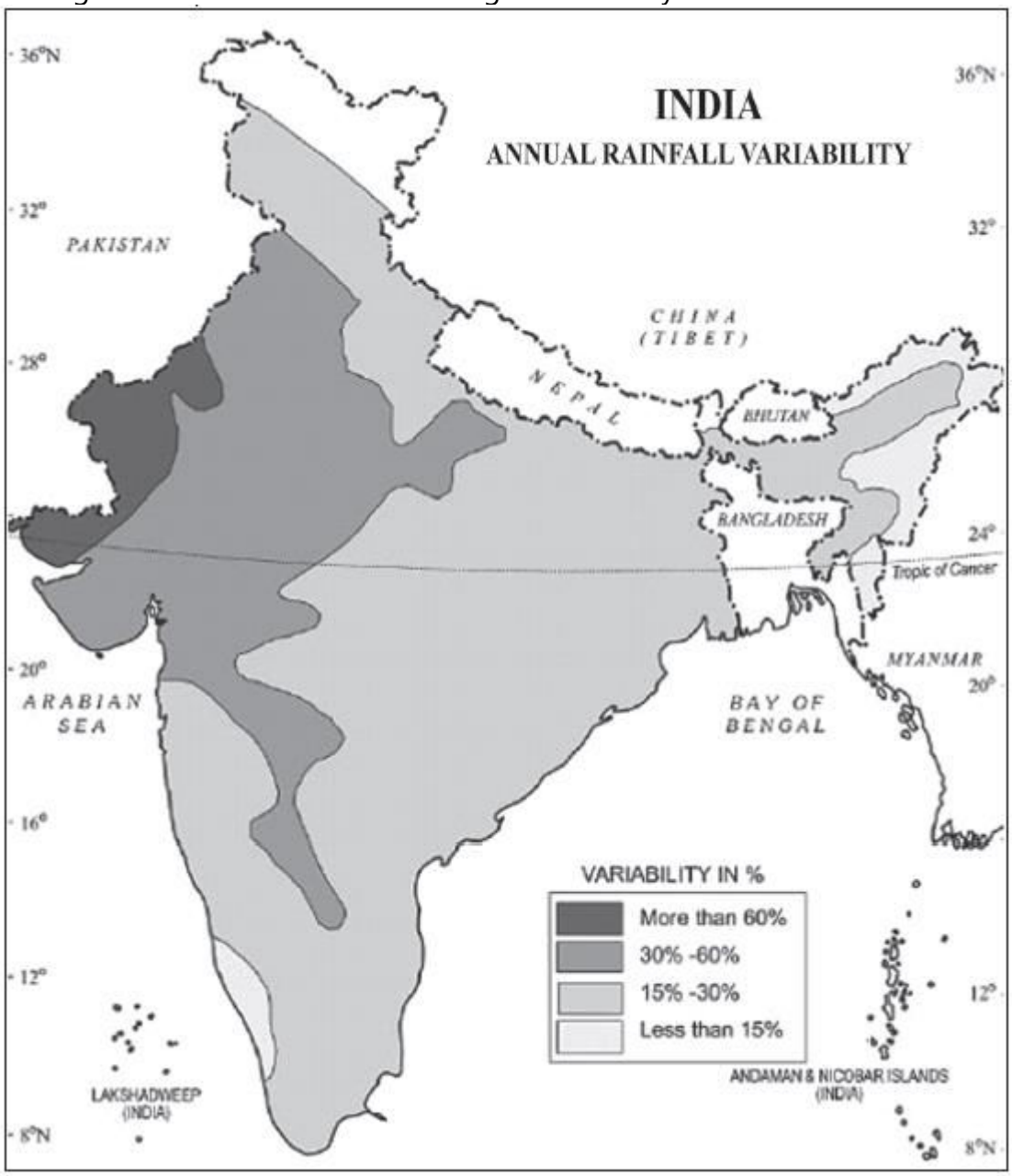
3. Low rainfall (50–100 cm)
- Western Uttar Pradesh
- Punjab
- Haryana
- Eastern Rajasthan
- Northern Gujarat

4. Inadequate rainfall (less than 50 cm)
- Telangana
- Interior parts of Karnataka and Maharashtra
- Jammu and Kashmir, and Ladakh
- Western Rajasthan
- Saurashtra region of Gujarat

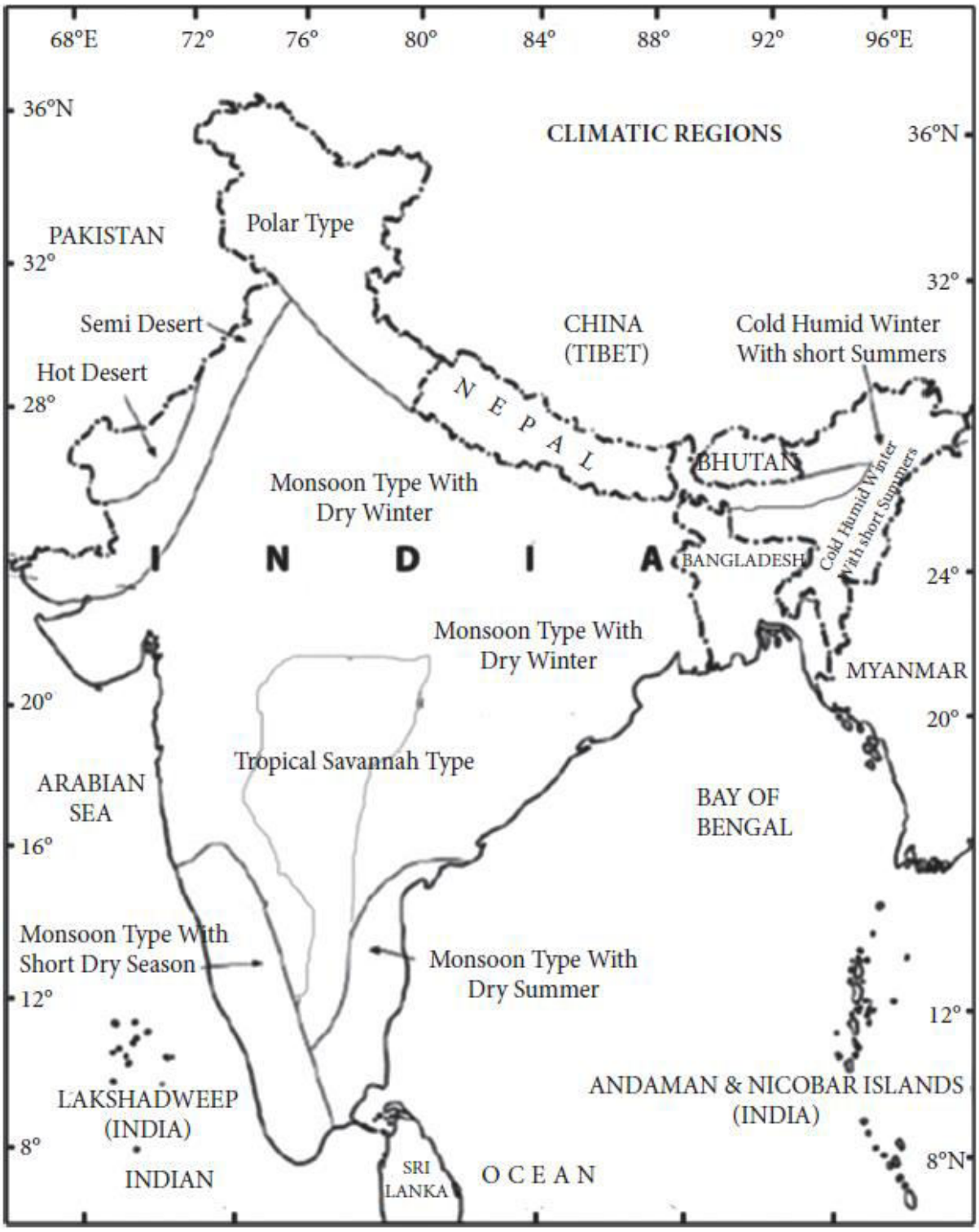
The interior parts of Maharashtra, Karnataka, and Telangana receive less than 50 cm rainfall because these regions are located in the rain shadow region of the Western Ghats.
The part of Rajasthan that is east to the Aravallis receives sufficient rainfall and is fertile in nature. Eastern Rajasthan includes fertile plains of Jaipur and Udaipur. The central part of Rajasthan (to the west of the Aravallis) is Bagar (semi-desert region). The westernmost part of Rajasthan is Thar Desert.
The eastern part of Rajasthan is on the windward side of Aravallis, whereas the central and westernmost parts of Rajasthan are on the leeward side of the Aravallis.

Variability of Rainfall

Within India, the rainfall variability is higher in regions where south-west monsoon reaches later. Thus, the regions with higher rainfall have less variability in rainfall and the regions with lesser rainfall have higher variability in rainfall.



CLIMATIC REGIONS OF INDIA



Primarily, Indian climate is mainly of the monsoon type, but India can be further divided into eight climatic regions:

1. Monsoon with short dry season: West coast of India, south of Goa on account of break in monsoon.

2. Monsoon with dry summers and wet winters: Coast of Tamil Nadu.

3. Tropical savannah: Central part of peninsular plateau (Telangana and interior parts of Maharashtra and Karnataka).

4. Semi-arid climate: Southern parts of Punjab and Haryana, central Rajasthan, and north-eastern Gujarat.
5. Hot desert: Western Rajasthan.
6. Cold humid winter with short summer: North-east, except plains of Assam.
7. Polar type: Jammu and Kashmir, Uttarakhand, Himachal Pradesh & Ladakh.
8. Monsoon with dry winters: Remaining parts of the country.

Practice Questions

1. Consider the following states/UTs:
1. West Bengal
2. Chhattisgarh
3. Haryana
4. Jammu and Kashmir
Arrange the states given above in terms of ascending order of rainfall?
(a) 4 , 2, 3, and 1
(b) 4, 3, 2, and 1
(c) 3, 4, 1, and 2
(d) 3, 4, 2, and 1

2. Consider the following statements regarding the climatic regions in India:
1. Tropical savannah type of climate is found in the north-eastern states of India.
2. Semi-arid steppe climate is found in central Rajasthan.
3. Cold humid winter type of climate is found in Jammu and Kashmir.
How many of the statements given above is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

3. Consider the following statements:
1. The Kullu Valley in Himachal Pradesh receives snowfall during winter. The Kullu Valley receives moisturebearing winds in the form of Western Disturbances during winter.
2. The moisture-bearing Western Disturbances received during winters cover the whole of India by the beginning of March.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

4. For short-term climate prediction, which one of the following events is associated with weak monsoon rains in the Indian Subcontinent?
(a) La Nina
(b) Movement of jet streams
(c) El Nino
(d) Global warming

5. Which one of the following is the correct sequence of the given Indian cities in the decreasing order of their annual rainfall?
(a) Kochi–Kolkata–Delhi–Patna
(b) Kolkata–Kochi–Patna–Delhi
(c) Kochi–Kolkata–Patna–Delhi
(d) Kolkata–Kochi–Delhi–Patna

6. Consider the following statements:
1. The duration of the monsoon rainy season decreases from south to north and from east to west.
2. The distribution of rainfall received from south-west monsoon is determined by the relief.
3. The Coromandel coast receives less rainfall than that received by Malabar coast.
How many of the statements given above are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

7. Which type of forest can be found in the states of Punjab and Haryana?
(a) Alpine forest
(b) Moist tropical forest
(c) Dry tropical forest
(d) Montane subtropical forest

8. What is the sequential order of vegetation types observed while moving from Assam Valley to Rajasthan Plains?
(a) Tropical Wet Evergreen–Tropical Moist Deciduous–Tropical Dry Deciduous–Tropical Thorn Forest
(b) Tropical Thorn Forest–Tropical Dry Deciduous–Tropical Moist Deciduous-Tropical Wet Evergreen
(c) Tropical Moist Deciduous–Tropical Wet Evergreen–Tropical Dry Deciduous-Tropical Thorn Forest
(d) Tropical Dry Deciduous–Tropical Thorn Forest–Tropical Moist Deciduous–Tropical Wet Evergreen

9. Among the following regions of India, which one receives the least amount of annual rainfall?
(a) 80 km wide coastal belt from Nellore to Point Calimere
(b) The middle and lower Assam Valley
(c) North-eastern Rajasthan
(d) The coastal plains of Gujarat, south of Narmada

10. As per the classification of climate, which one of the following is the suitable description for North East India, including north Bengal?
(a) Tropical monsoon rainforest
(b) Subtropical rainforest with wet winter
(c) Humid subtropical with dry winter
(d) Tropical wet and dry climate (monsoon savannah)

11. Which one of the following pair of cities has the largest difference in their annual average rainfall as compared to the other three pairs?
(a) Jabalpur and Nagpur
(b) Mumbai and Pune
(c) Kolkata and Bhubaneswar
(d) Guwahati and Shillong

12. With reference to north-east monsoon (winter monsoon) in India, consider the following statements:
1. Unlike the summer monsoon, there is no easterly jet stream over the peninsula during the winter monsoon.
2. More than two-thirds of annual rainfall in Coimbatore, Salem, and Nilgiri districts occur from October to December.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

13. Which of the following is/are the effects of Himalayas on India's climate?
1. Preventing North India from becoming a cold desert
2. Precipitation in North India
3. Moderating effect on climate in Peninsular India
Select the correct answer using the codes given below:
(a) 1 only
(b) 2 and 3 only
(c) 1 and 2 only
(d) 1, 2, and 3

14. Consider the following statements with regards to variability of rainfall in India.
1. There is high rainfall as well as high rainfall variability in Western Ghats.
2. There is low rainfall, but high rainfall variability in Rajasthan.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2

(d) Neither 1 nor 2

15. With reference to Western Disturbances, consider the following statements:
1. The Western Disturbances originate over the Mediterranean sea and travel eastwards across West Asia.
2. The moisture content of the Western Disturbance gets augmented from the Caspian Sea in the north and Persian Gulf in the south.
3. The Western Disturbance is beneficial for Rabi crops in North India.
How many of the statements given above is/are correct?
(a) Only one
(b) Only two
(c) All three
(d) None

16. Which of the following best explains why Tamil Nadu coast remains dry during the summer monsoon season?
1. It is situated parallel to the Bay of Bengal branch of southwest monsoon.
2. It is located in the rain shadow area of the Arabian Sea branch of the south-west monsoon.
Select the correct answer using the codes given below:
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

17. Which of the following statements are correct regarding Indian monsoon?
1. The Bay of Bengal branch is deflected towards India by Arakan Hills in Myanmar.
2. The Coromandal coast receives substantial rainfall from the Bay of Bengal branch of south-west monsoon.
Select the correct answer using the codes given below:
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

18. Consider the following statements:
1. The Deccan plateau gets low rainfall due to the rain shadow effect of Western Ghats.
2. Aravallis is one of the reasons for less rainfall in Rajasthan.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2

(d) Neither 1 nor 2

19. Which of the following factors affect the climate of India?
1. La Nina
2. Westerly jet stream
3. Tibetan plateau
4. Indian Ocean
Select the correct answer using the codes given below:
(a) 1 and 2 only
(b) 2, 3, and 4 only
(c) 1, 2, and 3 only
(d) 1, 2, 3, and 4

20. Which of the following areas receive annual rainfall of more than 200 cm?
1. Western slopes of Western Ghats
2. Western Himalayas
3. Northern Tamil Nadu
Select the correct answer using the codes given below:
(a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

21. Rainfall in India display which of the following features?
1. Inter-seasonal variation
2. Intra-seasonal variation
3. Orographic rainfall
4. Convectional rainfall
Select the correct answer using the codes given below:
(a) 1, 2, and 3 only
(b) 3 and 4 only
(c) 1, 2, and 4 only
(d) 1, 2, 3, and 4

22. Consider the following statements about Western Disturbances:
1. These are the extra-tropical storms originating in the Mediterranean Sea.
2. These bring sudden winter rain and snow to the north-western parts of the Indian Subcontinent.
3. These are non-monsoonal precipitation pattern driven by the Easterlies.
4. Western Disturbances are important to the development of the Kharif crop in North India.
Which of the statements given above are correct?
(a) 1 and 2

(b) 2 and 3
(c) 1, 2, and 3
(d) 1, 2, and 4

23. Consider the following statements:
1. Jet streams are high-altitude and high-speed wind system.
2. Jet streams follow a zigzag path.
3. Normally, a jet stream is thousands of kilometres in length and hundreds of kilometres in width.
Which of the statements given above is/ are correct?
(a) 1 only
(b) 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

24. Consider the following statements about the inter-tropical convergence zone (ITCZ):
1. It is a high-pressure zone located near the equator.
2. During July, ITCZ shifts to about 20–25°N latitudes over Gangetic plains.
3. The shift of ITCZ in summer encourages the south-west monsoon in India.
Which of the statements given above is/are correct?
(a) 1 and 2
(b) 2 and 3
(c) 1 and 3
(d) All of these

PERFECTING PAST PRELIMS

1. Consider the following statements: (2009)
1. In the world, tropical deserts occur along the western margins of continents within the Trade Wind belt.
2. In India, the east Himalayan region gets high rainfall from north-east winds.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

2. If there were no Himalayan ranges, what would have been the most likely geographical impact on India? (2010)
1. Much of the country would experience cold waves from Siberia.
2. The Indo-Gangetic plain would be devoid of such extensive alluvial soils.
3. The pattern of monsoon would be different from what it is at present.

Which of the statements given above is/are correct?
(a) 1 only
(b) 1 and 3 only
(c) 2 and 3 only
(d) 1, 2, and 3

3. Consider the following statements:(2012)
1. The duration of monsoon decreases from southern India to northern India.
2. The amount of annual rainfall in the northern plains of India decreases from east to west.
Which of the statements given above is/are correct?
(a) 1 only
(b) 2 only
(c) Both 1 and 2
(d) Neither 1 nor 2

Answer Keys

Practice Questions

1. (b)	2. (a)	3. (a)	4. (c)	5. (c)
6. (c)	7. (c)	8. (a)	9. (c)	10. (c)
11. (b)	12. (a)	13. (c)	14. (b)	15. (b)
16. (c)	17. (a)	18. (c)	19. (d)	20. (a)
21. (d)	22. (a)	23. (d)	24. (b)	

Perfecting Past Prelims

1. (a)	2. (d)	3. (c)		

Solutions

Practice Questions

2. (a) Statement 1 is incorrect. Tropical Savannah type of climate is found in the central part of peninsular plateau.
Statement 3 is incorrect. The winters in Jammu and Kashmir are not humid in nature.

3. (a) Statement 2 is incorrect. The moisture bearing Western Disturbances received during winters cover only the northern plains of India.

4. (c) Option (a) is incorrect. La Niña strengthens Indian Monsoon and thus leads to more rainfall.
Option (b) is incorrect. Jet streams are not associated with monsoon rains.
Option (c) is correct. El Niño leads to weak monsoon and is used for prediction of upcoming monsoon rainfall.

Option (d) is incorrect. Global warming is a significantly long-term process and is associated with long-term prediction.

7. (c) Punjab and Haryana receive an annual average rainfall between 50 and 75 cm. Thus, dry tropical forest is the main vegetation of this region.

10. (c) Options (a) and (b) are incorrect. Rainforests are present in equatorial regions. The north-east of India, including North Bengal, receives high rainfall during summers. Thus, the region has high humidity. The region is located in subtropical latitudes. The winters are dry. Thus, humid subtropical with dry winter is the appropriate description for this region.

11. (b) Mumbai 233 cm and Pune 78 cm The other close option is Shillong 227 cm and Guwahati 176 cm.

12. (a) Statement 2 is incorrect. Rainfall in Coimbatore, Salem, and Nilgiri districts occurs throughout the year. These districts are in the interior part of Tamil Nadu and are not located at coast.

13. (c) Statement 2 is correct. Himalayas trap the monsoon winds, forcing winds to shed its moisture within the Indian sub-continent.
Statement 1 is correct. The Himalayas form a barrier that prevents the cold winds of north Asia from blowing into India, thus protecting it from severely cold winters. Moreover, many rivers originate from Himalayas, which make North India fertile. Thus, in the absence of Himalayas, North India would have been cold desert.
Statement 3 is incorrect. The main reason for moderating effect on climate in Peninsular India is the presence of water bodies.

14. (b) Statement 1 is incorrect. There is high rainfall but low rainfall variability in Western Ghats.

15. (b) Statement 2 is incorrect. The moisture content of the Western Disturbance is derived from Mediterranean Sea.

17. (a) Statement 2 is incorrect. Coromandel Coast receives substantial rainfall from north-east monsoon.

20. (a) Among the given options, more than 200 cm is received by the western slopes of the Western Ghats.

21. (d) Statement 1 is correct. There is a clearcut inter-seasonal variation in the amount of rainfall.

Statement 2 is correct. Even within the season, there is a lot of variation in the amount of rainfall.
Statements 3 and 4 are also correct. Rainfall in India is both orographic and convectional in nature.

22. (a) Statement 3 is incorrect. Western disturbances are a non-monsoonal precipitation pattern driven by the Westerlies.
Statement 4 is incorrect. Western disturbances bring rainfall for rabi crops in North India. Western disturbances do not play a role in the development of kharif crop in North India.

24. (b) Statement 1 is incorrect. The Inter-Tropical Convergence Zone (ITCZ) is a low-pressure zone located near the equator.

Perfecting Past Prelims

1. (a) Statement 2 is incorrect. In India, the East Himalayan region gets high rainfall from the Bay of Bengal branch of south-west monsoon.