

During October-November, the monsoon trough of low pressure becomes weaker and is gradually replaced by high pressure. The outreach of the monsoon becomes unsustainable and it starts withdrawing gradually. This is known as the retreat of monsoon.

#### **October Heat:**

- (i) The retreat of the monsoons is marked by clear skies and rise in temperature.
- (ii) The land is still moist.
- (iii) Owing to the conditions of high temperature and humidity, the weather becomes oppressive, which is known as October heat in northern India.

#### **Cyclonic Depressions which originate over the Andaman Sea:**

In October and November the shift of the low pressure from land to sea is far from smooth. The period is associated with occurrence of cyclonic depressions which originate over the Andaman Sea.

The cyclones affect the eastern coasts of southern peninsular.

The cyclones affect the Sundarban Delta, Mahanadi, Godavari, Krishna and Kaveri deltas too.

These tropical cyclones cause heavy and widespread rain.

One adverse effect of the cyclones is, it is very often destructive. No year is found disaster free, it affects one or the other deltas of the Eastern Coast.

### **VARIETIES THE MONSOONS IN INDIA**

At times the monsoons come in full swing, or it may fail altogether. Thus, causing the twin problems of floods and famines.

The alternation of dry and wet spells keeps on varying in intensity, frequency and the duration.

Implications of vagaries of the monsoons:

- (i) Due to the late arrival the crops dry up.
- (ii) Due to excessive rains floods are caused, leading to destruction.
- (iii) The amount of rain may vary causing drought conditions.
- (iv) Sometimes the monsoons come early, normal or late.
- (iv) The monsoons may retreat early, normal or late.

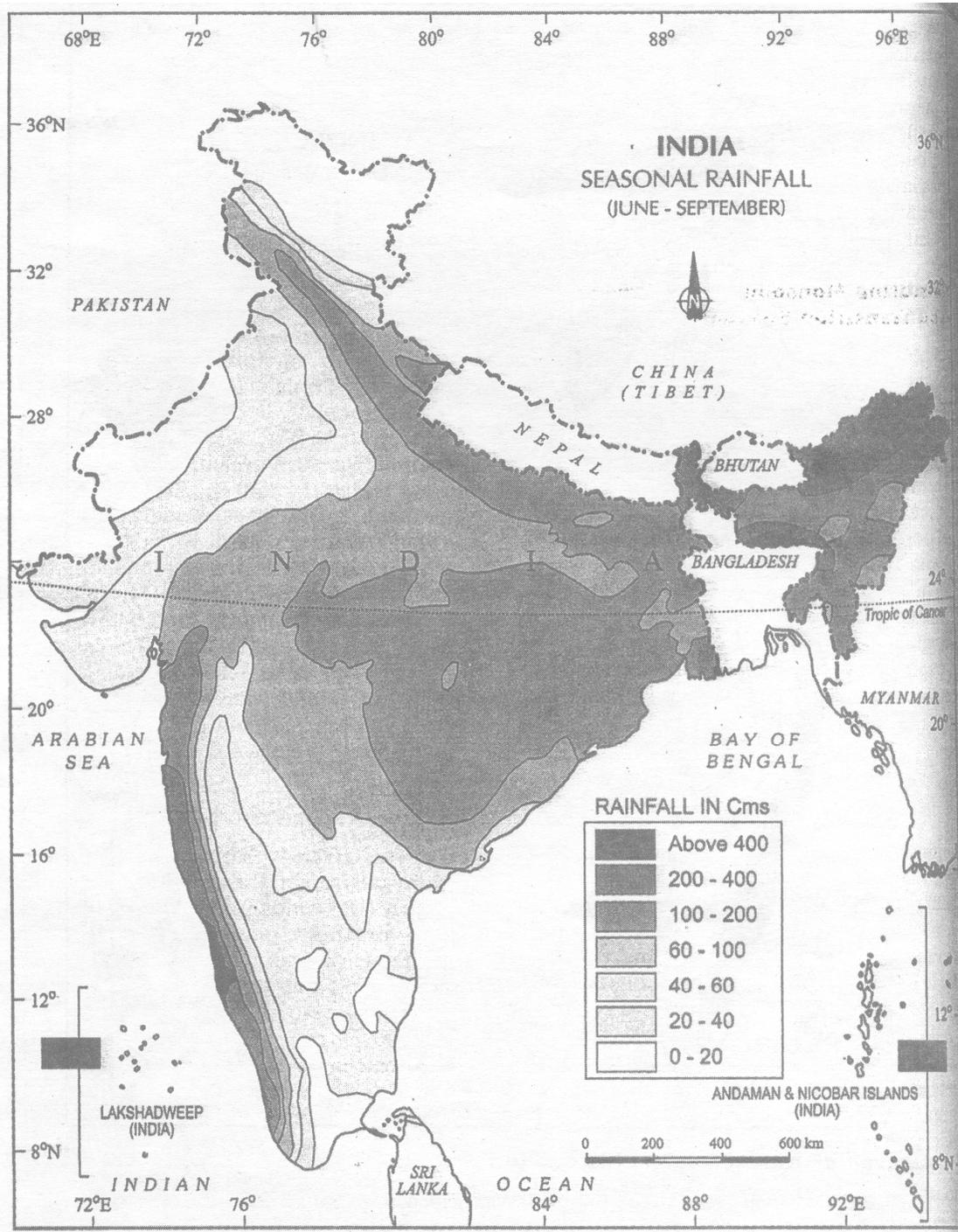
### **DISTRIBUTION OF PRECIPITATION IN THE COUNTRY**

**Areas of Heavy rainfall:** Areas which get rainfall of 200 cms and above are Assam, the Ganga Delta, the Western Ghats and the Western Coastal regions and the mountainous regions of Himachal Pradesh.

**Areas of Moderate Rainfall:** Areas which get annual rainfall between 100 cms to 200 cms are Madhya Pradesh, Orissa, Chhota Nagpur, Western Bengal, Bihar, Eastern U.P., North-Eastern Punjab; Eastern parts of Tamil Nadu and Eastern slopes of Western Ghats receive moderate rainfall.

**Areas with Low Rainfall:** Areas receiving annual rainfall between 50 cms to 100 cms are the Deccan Plateau, Western U.P., South-Eastern Punjab, Eastern Rajasthan and parts of Kashmir get low rainfall.

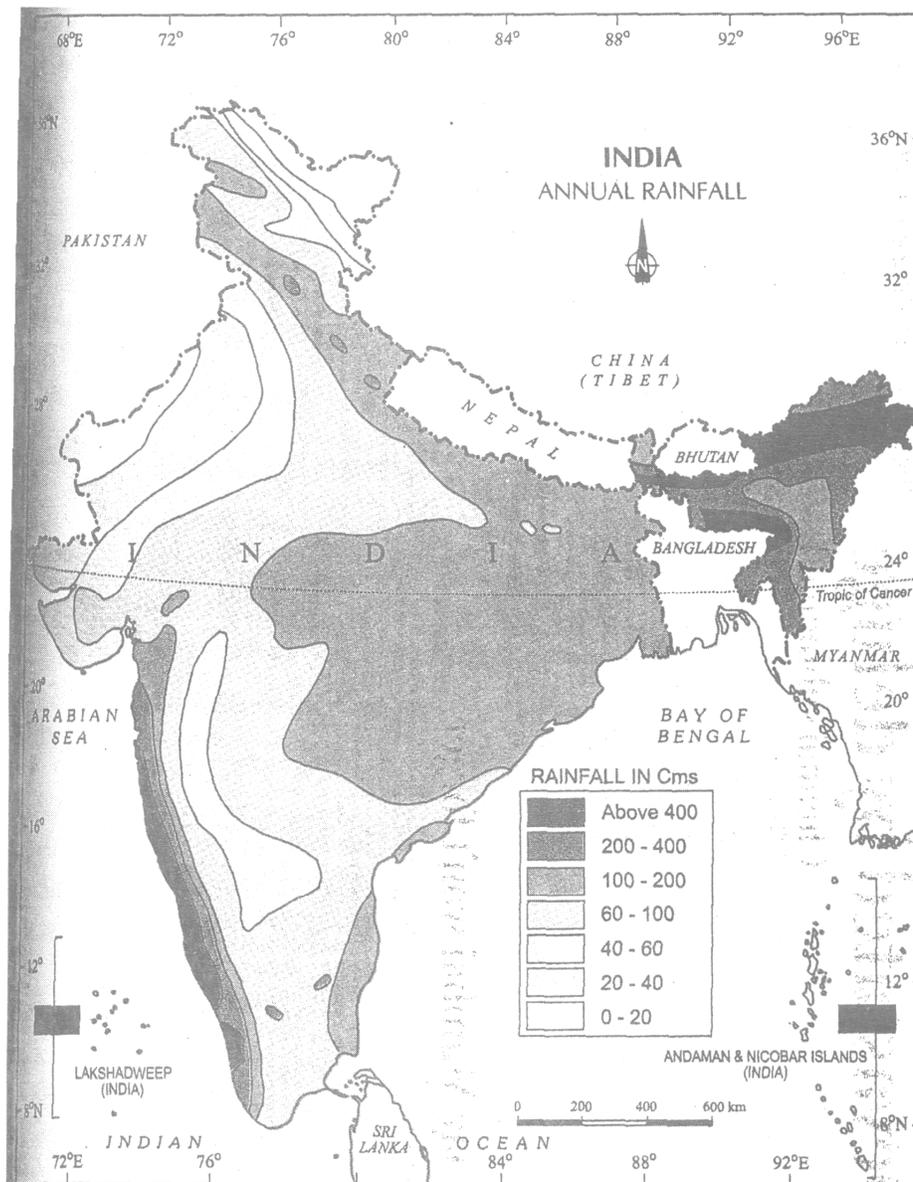
**Areas with Scanty Rainfall:** Areas which get less than 50 cms rainfall annually are western Rajasthan, Kutch, Southeastern parts of Haryana, Northeastern Kashmir get scanty rainfall.



*Figure : Seasonal Rainfall (June-September)*

**Consequences of the Uneven Precipitation in India :**

- (i) If there is too much rain in certain areas they cause floods and havoc all around. many grown up crops, villages, railway lines are washed away resulting in great loss of men and money.
- (ii) If there are not sufficient rains even then people are doomed because of drought and hunger. Many people begin to starve and die of hunger. Standing crops dry away thereby bringing doom to the farmers.



**Uneven distribution rainfall is due to:**

- (A) Relief / Orography
- (B) Wind direction
- (C) Location
- (D) Low pressure axis.

Relief / orography largely govern the distribution of rainfall. For instance, the windward side of the Western Ghats registers a rainfall of 250cms. on the other hand, the leeward side of this ghat is hardly able to receive 50cms.

Again, the heavy rainfall in the northwestern states can be attributed to their hilly ranges and the eastern Himalayas.

Western Rajasthan gets scanty rain because the Arabian Sea branch of the monsoon blows parallel to the Aravallis.

Rainfall in the north decreases from east to west. Kolkata situated near the sea receive about 120 cm, Patna 102cm, Allahabad 91cm, and Delhi 56 cm.



## **MONSOON AS A UNIFYING BOND**

- (i) There is great diversity in the climatic conditions due to location, extent and relief features.
- (ii) But these diversities are subdued by the monsoons, which prevails over the whole country.
- (iii) This water scarcity is felt all over country.
- (iv) Thus the arrival of the monsoon is most welcome; it changes the Indian landscape, gives impetus to agricultural activities, the total life of the Indian people revolves around the monsoons, including festivals.

## **IMPORTANT POINTS TO REMEMBER**

### **(a) Mango showers:**

- (i) Mango showers are pre-monsoon showers.
- (ii) This phenomenon is observed in Kerala and coastal Kamataka.
- (iii) The mango showers help in the early ripening of, mangoes.

### **(b) Kalbaisakhi:**

Kalbaisakhi means the violent black clouds of the month of Baisakh. This is the name given to the north-westerly and northerly winds in Bengal and Assam. These winds cause very heavy rains and distraction.

### **(c) Chennai receives more rain in winter:**

- (i) The northeast winds pick up moisture while crossing Bay of Bengal. these winds are onshore in the winter season.
- (ii) In the summer Chennai lies in the rain-shadow of the Western Ghats, moreover the winds are offshore, therefore receives less rainfall.

### **(d) Break or burst of the monsoon:**

The sudden approach of the moisture laden winds is associated with violent thunder and lightening. This is known as “break” or “burst” of the monsoons. The first ‘break’ of monsoons on the south-west-coast of India is around 1<sup>st</sup> June.

### **(e) Southern Oscillation:**

The pressure systems of Pacific and Indian Oceans are interrelated. When the pressure is high in the pacific, there is low pressure in the Indian Ocean. The winds move from high pressure to low pressure and vice-versa. This causes shifting of winds across the equator in different seasons. this is known as the southern oscillation.

### **(f) El Nino Southern Oscillations :**

A feature connected with Southern Oscillation is the El Nino, a warm ocean current that flows past the Peruvian Coast, in place of the cold Peruvian current, every 2 to 5 years. the changes in pressure conditions are connected to the El Nino, the phenomenon is referred to as ENSO (El Nino Southern Oscillations).

### **(g) Mawsynram receives the highest rainfall in the world:**

- (i) Mawsynram is situated at the head of a funnel shaped valley in the Khasi hills.
- (ii) Its unique topographical location together with wind direction is responsible for causing the heaviest rainfall in the world.

### **(h) The rainfall decreases from South to North :**

- (i) The S.W. Monsoons originates from the Indian Ocean and divides into branches due to the shape of the Indian peninsular.

- (ii) Trivandrum gets above 200 cm.
- (iii) Whereas Delhi situated in the interior gets only about 50 cm.
- (iv) The Arabian Sea branch strikes the Western Ghats and causes heavy rainfall.
- (v) Whereas another branch of the Arabian Sea monsoon blows parallel to the Aravallis. thus jodhpur gets less than 25cms of rain.

**(i) The Western Ghats receive more rain from the southwest monsoons than the Eastern Ghats because:**

- (i) The Arabian Sea branch of the monsoon is on shore.
- (ii) These winds are forced to rise and cause heavy rains.
- (iii) By the time these winds reach the east coast, most of the moisture is lost.
- (iv) The winds are offshore, so they given less rain.
- (v) Eastern Ghats lies on the leeward/rain-shadow area, hence it gets less rain.

**(j) Indian would have been an arid land or desert if there had been no phenomena of monsoons :**

- (i) Indian receives 75 to 90% of the rainfall from the monsoons.
- (ii) These monsoons winds occur due to the uneven heating of land and sea.
- (iii) The mighty Himalayas check the two branches of southwest monsoons, the Arabian Sea branch and the Bay of Bengal branch. These, cover the whole of India thus preventing it from becoming a desert.

**DIFFERENCE BETWEEN**

**(a) Equable climate & extreme climate:**

Equable Climate	Extreme Climate
(i) The climate is moderate, that is neither too hot in summer nor too cold in winter.	(i) The climate is continental, that is very hot in summer and very cold in winter.
(ii) The annual and daily range of temperature is low.	(ii) The annual and daily range of temperature is high.
(iii) Those places situated near the sea coast enjoy equable climate e.g., Mumbai.	(iii) Places situated in the interior have extreme climate e.g., Delhi.

**(b) Rainfall and precipitation:**

Rainfall	Precipitation
(i) It is only form of precipitation.	(i) It is broader term, it includes rainfall, sleet, snow and hail.
(ii) The water vapour condenses and changes into water and falls down as drops of rain.	(ii) The water vapour changes into different forms such as rainfall, snow, sleet or hail.
(iii) It involves a simple process i.e. ascending of air, colling and coming down as rain.	(iii) It is a more comples process.
(iv) Delhi receives rainfall.	(iv) Leh receives snowfall.

**(c) South-West Monsoons and Retreating Monsoons:**

<b>South-West Monsoons</b>	<b>Retreating Monsoons</b>
(i) These winds blow from June to September.	(i) These winds blow from October to November.
(ii) These are moisture laden winds.	(ii) These winds originate from the land, hence are dry.
(iii) About 75 to 90% of the annual rainfall occurs during these months all over the country.	(iii) These cause rainfall over the south-eastern coast when the winds pick up moisture from the Bay of Bengal.
(iv) It is pleasant season of rains and greenery all over the country.	(iv) Due to clear skies, high temperature and high humidity, the weather is oppressive known as 'October heat'

**(d) Loo and Cold wave:**

<b>Loo</b>	<b>Cold wave</b>
(i) It occurs in the hot weather season.	(i) It occurs in the cold weather season.
(ii) The hot and dry winds blow in the after-noon and may continue till mid Night	(ii) The western disturbances cause heavy snow fall in the western Himalayas this causes lowering of temperature on the plains.
(iii) It raises the day temperature. the temperature ranges between 40° C to 50° C	(iii) the temperature falls by 55° C from the normal

**(e) South-West Monsoons and North-East Monsoons:**

<b>South-West Monsoons</b>	<b>North-East Monsoons</b>
(i) These are seasonal winds.	(i) These are trade winds.
(ii) Blow during summer, June to September.	(ii) Blow in winter, December to February.
(iii) Blow from sea to land.	(iii) Blow from land to sea.
(iv) Bulk to the annual rainfall received in India is brought by these winds.	(iv) These are dry winds, while crossing the Bay of Bengal they pick up moisture and give rainfall to the Coromandel Coast/Tamil Nadu coast.
(v) High temperature and low pressure.	(v) Low temperature and high pressure.
(vi) High humidity.	(vi) Low humidity.

**EXERCISE**

**OBJECTIVE DPP - 4.1**

- Weather is the -  
(A) condition of atmosphere at a place and also at a particular time  
(B) the result of air masses  
(C) the sum total of the atmospheric pressures  
(D) none of the above
- Summer season occurs in account of -  
(A) the low angle of the sun  
(B) the high angle of the sun  
(C) the slanting rays of the sun  
(D) none of these

3. Monsoons are -  
(A) seasonal winds (B) permanent winds (C) temporary winds (D) local winds
4. A cyclone has a low pressure area in the centre.  
(A) Yes (B) No (C) Not always (D) Not known
5. The tropical cyclones of the Bay of Bengal are usually called -  
(A) typhoons (B) hurricanes (C) depressions (D) tornadoes
6. Indian receives most rain from -  
(A) the northeast monsoon (B) the retreating monsoon  
(C) tropical cyclones (D) the southwest monsoon
7. The phenomenon of the monsoon is only confined to the tropical land lying between -  
(A) 20° N and 20° S (B) 33° N and 33° S (C) 23 $\frac{1}{2}$ ° N (D) 40° N and 40° S
8. During the cold weather season the temperature decreases from -  
(A) north to south (B) south to north (C) east to west (D) west to east
9. The western disturbances originate over the -  
(A) Mediterranean Sea (B) Arabian Sea (C) Red Sea (D) Bay of Bengal
10. What is the cause of snowfall in the Himalayas during the winter season ?  
(A) tropical cyclones (B) southwest monsoon (C) western disturbances (D) northeast monsoons
11. The strong, hot and dry winds called Loo blows over the -  
(A) Northern and northwestern plains (B) Deccan Plateau  
(C) Coastal Plains (D) Himalayas
12. 'Kalbaiskhi' the northwesterly winds cause thunderstorms and sharp showers in  
(A) West Bengal (B) Punjab (C) Rajasthan (D) Madhya Pradesh
13. Which mountain range acts as a barrier in the path of the Arabian Sea branch ?  
(A) Aravallis (B) Western Ghats (C) Eastern Ghats (D) Rajmahal Hills
14. Which hills turn direction of the Bay Bengal branch of the southwest monsoon ?  
(A) Aravallis (B) Nilgiris (C) Arakan (D) Rajmahal Hills
15. How much rainfall occurs during the southwestern monsoon season ?  
(A) 85% to 100% (B) 75% to 90% (C) 50% to 60% (D) 60% to 70%

### SUBJECTIVE DPP - 4 .2

#### Very short answer type question:

1. Mention the major factors that control the climate of any place.
2. Where does the low pressure area develop in May?
3. Name the four months in which Indian receives the bulk of rainfall.
4. Why does Tamil Nadu receive winter rainfall?
5. Name two states where mango showers are common.
6. Name some region for which the tropical cyclones are very destructive.
7. What is the name given to the climate of India?
8. From where do western disturbances come into India?
9. Name the hill which deflects the Bay of Bengal branch to India.
10. Write any two parts of India which receive minimum rainfall.

#### Short answer type question:

11. Name the elements of weather and climate.
12. What are 'jet Stream'?

13. What meant by the term 'loo'?

14. What are the 'retreating monsoons'?
15. Define the following terms:  
(i) Mango showers                      (ii) Jet Streams                      (iii) Loo.
16. How does the Himalayan mountain range act as an effective climatic divide?
17. What is meant by 'Southern Oscillation'? How it affects Indian climate?
18. What is meant by 'October Heat'? Why is it short lived?
19. How is southwest monsoon different from the northwest monsoon?
20. Describe the winter season in India.

**Long answer type question:**

21. Describe the regional variations in the climatic condition of India with the help of suitable examples.
22. Describe the factors controlling the Indian weather conditions.
23. Describe how the location and relief are important factors in determining the climate of India.
24. Give an account of the hot weather season in India.
25. Discuss the distribution of precipitation in the country and the consequences of its uneven distribution.
26. Explain how does monsoon act as an unifying bond in the country.

**Previously Asked Problems**

27. 'India has diverse climatic conditions'. Support this statement with four examples. [Delhi 2001 C]
28. Why is rainfall distribution uneven in India? Give four reasons. [Delhi 2001 C]
29. How is the distribution of rainfall received from southwest monsoon largely governed by the orography in India? Explain with four examples from different parts of the country. [Delhi 2001 C]
30. Examine the role of the Himalayan Mountain Range on the north of India as a climatic divide. [Delhi 2001 C]
31. How do Western jet stream and Eastern jet-stream affect the climate of India? [Delhi 2001 C]
32. India would have been an arid land or desert if there had been no phenomena of monsoons". Explain it by giving four points. [A 1 1997]
33. Why is the distribution of rainfall in India uneven? Give four reasons. [Delhi 1996]
34. How is the South-West Monsoon different from the North-East Monsoon? Write any four differences. [Delhi 1996]
35. "Indian has diverse climate conditions". Support this statement by giving two examples each of temperature and precipitation. [A 1 1996]
36. Name the coast where the tropical cyclones that originate in the Bay of Bengal and over the Andaman Sea give rain. Give one adverse effect of these cyclones. [A 1 1995 C]
37. Describe three main features of cold weather season. [A 1 1994 C]
38. Describe three main features of cold weather season. [Delhi 1994 C]
39. Mumbai receives more rainfall summer season while Chennai in winter. Give any two reasons for it. [Delhi 1994 C]
40. What type of climate would India have had, if the Arabian sea, Bay of Bengal and the Himalaya had not been there? Explain it with reference to temperature and precipitation. [Delhi 1997 C]
41. Describe the factors which influence the climate of India. [Foreign 1995]

**A N S W E R   K E Y**

(Objective DPP # 4.1)

Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans	A	B	A	B	C	D	A	B	A	C	A	A	B	C	B