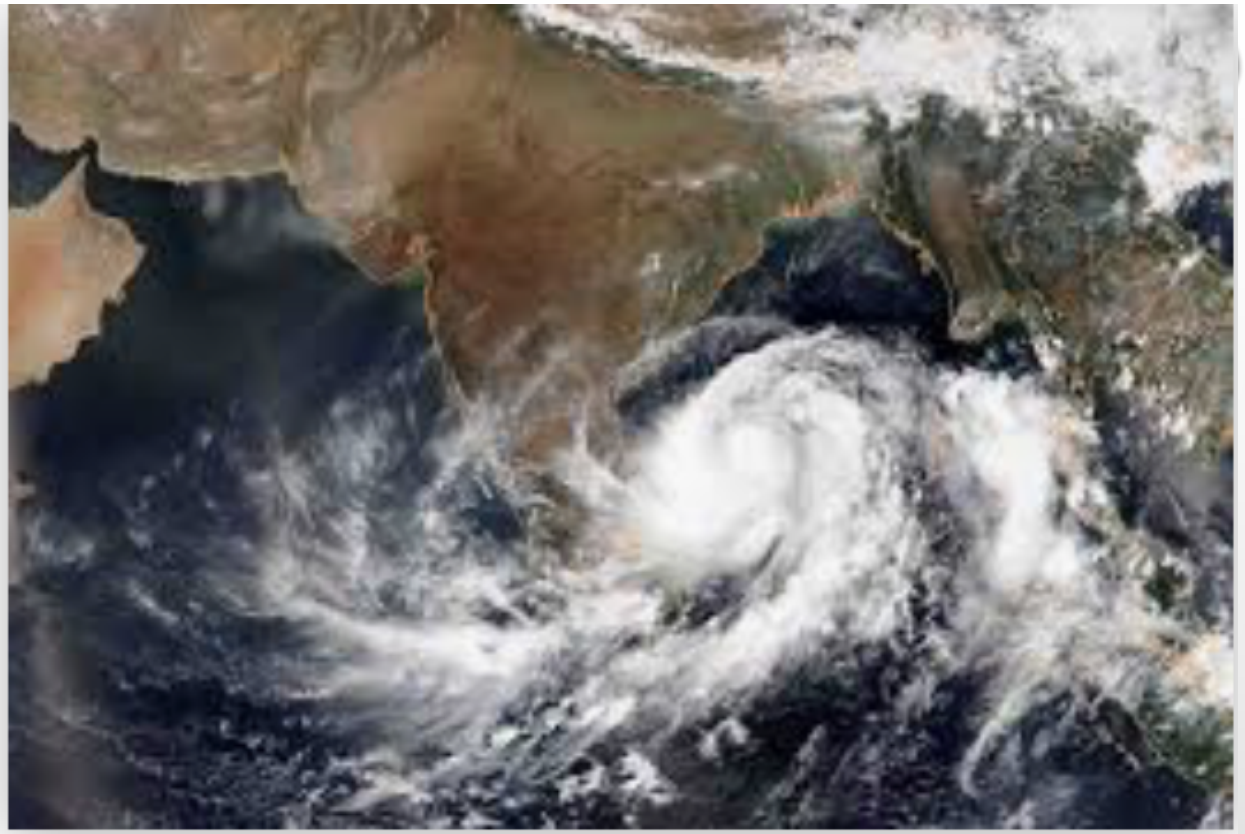
CLIMATE

FOCUS ON THE INDIAN SUB-CONTINENT

MODULE 2



THE ONSET AND WITHDRAWAL OF THE MONSOON

- **THE ONSET AND WITHDRAWAL OF THE MONSOON**
  THE TRADE WINDS ARE STEADY BUT THE MONSOON WINDS ARE PULSATING IN NATURE. THEY ARE AFFECTED BY DIFFERENT ATMOSPHERIC CONDITIONS, ESPECIALLY AS THEY FLOW OVER WARM TROPICAL AREAS. STARTING FROM EARLY JUNE, IN THE SOUTHERN PART OF THE INDIAN PENINSULA, THE MONSOON LASTS BETWEEN 100 AND 120 DAYS, WITHDRAWING BY MID-SEPTEMBER.
- RAINFALL INCREASES SUDDENLY AND CONTINUES FOR SEVERAL DAYS AT THE TIME OF ARRIVAL OF MONSOON. THIS PHENOMENON IS CALLED THE “BURST” OF THE MONSOON. IT IS DIFFERENT FROM PRE-MONSOON SHOWERS. IN ITS DURATION THE MONSOON RAINS ALTERNATE BETWEEN WET AND DRY SPELLS.
- **ONSET OF MONSOON**
  THE MONSOON GENERALLY REACHES THE SOUTHERN TIP OF THE PENINSULA DURING THE FIRST WEEK OF JUNE. AFTER STRIKING THE SOUTHERN TIP, IT BRANCHES INTO TWO PARTS: THE ARABIAN SEA BRANCH AND THE BAY OF BENGAL BRANCH; BOTH BRANCHES MOVE RAPIDLY.
- THE ARABIAN SEA BRANCH ADVANCES NORTH ALONG THE WESTERN GHATS, REACHING MUMBAI BY ABOUT 10TH OF JUNE AND SOON COVERS THE SAURASHTRA-KUCHCHH AND CENTRAL MOST PART OF THE DECCAN PLATEAU.
- THE BAY OF BENGAL BRANCH REACHES ASSAM IN THE FIRST WEEK OF JUNE AND GETS DEFLECTED TOWARDS THE WEST BY THE MOUNTAIN RANGES, THUS GIVING RAINFALL TO THE GANGA PLAINS.
- BOTH THE BRANCHES AGAIN MERGE OVER THE NORTH-WESTERN PART OF THE GANGA PLAINS. USUALLY, DELHI RECEIVES RAINFALL BY THE END OF JUNE, FROM THE BAY OF BENGAL BRANCH. BY THE FIRST-WEEK OF JULY, THE MONSOON COVERS WESTERN UTTAR PRADESH, PUNJAB, HARYANA AND EASTERN RAJASTHAN.
- **WITHDRAWAL OF MONSOON**
  THE WITHDRAWAL OR RETREAT OF THE MONSOON IS A MORE GRADUAL PROCESS. IT BEGINS BY EARLY SEPTEMBER IN THE NORTH-WESTERN STATES. BY MID-OCTOBER, IT WITHDRAWS COMPLETELY FROM THE NORTHERN HALF OF THE PENINSULA. THE WITHDRAWAL FROM THE SOUTHERN HALF OF THE PENINSULA IS FAIRLY RAPID. BY EARLY DECEMBER THE MONSOON HAS WITHDRAWN FROM THE REST OF THE COUNTRY.

IMPORTANT FEATURES OF THE MONSOON

IMPORTANT FEATURES OF MONSOON

- THE MONSOON IS KNOWN FOR ITS VARIABILITY AND UNCERTAINTY.
- THERE IS AN ALTERNATION OF DRY AND WET SPELLS, WHICH VARY IN INTENSITY, FREQUENCY AND DURATION.
- WHILE IT CAUSES HEAVY FLOODS IN ONE PART, IT MAY BE RESPONSIBLE FOR DROUGHT IN OTHER PARTS.
- ITS IRREGULAR ARRIVAL AND RETREAT (SOMETIMES DUE TO THE EFFECT OF EL NINO), CAUSES DISRUPTION TO FARMING SCHEDULES, FLOODS IN SOME AREAS AND DROUGHTS IN OTHER AREAS OF THE COUNTRY.

THE SEASONS IN INDIA

- **THE SEASONS**

  THE DISTINCT, SEASONAL PATTERN IS AN IMPORTANT CHARACTERISTIC OF THE MONSOON TYPE OF CLIMATE. THE WEATHER CONDITIONS IN INDIA GREATLY CHANGE FROM ONE SEASON TO ANOTHER. THESE CHANGES ARE PARTICULARLY NOTICEABLE IN THE INTERIOR PARTS OF THE COUNTRY. THE COASTAL AREAS DO NOT EXPERIENCE MUCH VARIATION IN TEMPERATURE THOUGH THERE IS VARIATION IN RAINFALL PATTERN.

- **THERE ARE BASICALLY FOUR SEASONS IDENTIFIED IN INDIA**: THE COLD WEATHER SEASON (WINTER), THE HOT WEATHER SEASON (SUMMER), THE ADVANCING MONSOONS (THE RAINY SEASON), AND THE RETREATING/POST MONSOONS (THE TRANSITION SEASON).

THE FOUR SEASONS IN INDIA

1. THE COLD WEATHER SEASON (WINTER)

THE COLD WEATHER SEASON BEGINS FROM MID-NOVEMBER AND STAYS TILL FEBRUARY IN NORTHERN PARTS OF INDIA, WITH DECEMBER AND JANUARY BEING THE COLDEST MONTHS. THE TEMPERATURE DECREASES FROM SOUTH TO NORTH.

- **THE FEATURES OF THE COLD WEATHER SEASON** ARE:: CLEAR SKY, LOW TEMPERATURE AND HUMIDITY, AND FEEBLE, VARIABLE WINDS ARE THE CHARACTERISTICS OF THE WEATHER DURING THE PERIOD.

2. THE HOT WEATHER SEASON(SUMMER)

THE HOT WEATHER SEASON STARTS WITH THE APPARENT MOVEMENT OF THE SUN TOWARDS THE NORTH, WHICH SETS OFF THE NORTHWARD MOVEMENT OF THE GLOBAL HEAT BELT. THE HOT WEATHER SEASON STARTS IN MARCH AND LASTS UP TO THE END OF MAY.

- **FEATURES OF HOT WEATHER SEASON ARE:** RISE IN TEMPERATURE, FALLING AIR PRESSURE, DUST STORMS, HOT, GUSTY, DRY WINDS, LOCALIZED THUNDERSTORMS.
- **TEMPERATURE VARIATION DURING HOT WEATHER**

  THE INFLUENCE OF THE SHIFTING OF THE HEAT BELT CAN BE SEEN FROM TEMPERATURE RECORDINGS TAKEN DURING MARCH TO MAY AT DIFFERENT LATITUDES. IN MARCH, THE HIGHEST TEMPERATURE IS ABOUT 38°C, RECORDED IN THE DECCAN PLATEAU AND IN GUJARAT AND MADHYA PRADESH IT IS AROUND 42°C IN THE MONTH OF APRIL. IN MAY, THE NORTH-WESTERN PARTS OF THE COUNTRY EXPERIENCE TEMPERATURES AROUND 45°C. DUE TO THE MODERATING INFLUENCE OF THE OCEANS, THE TEMPERATURES REMAIN LOW IN PENINSULAR INDIA.

THE FOUR SEASONS IN INDIA (2)

3. ADVANCING MONSOON (THE RAINY SEASON)

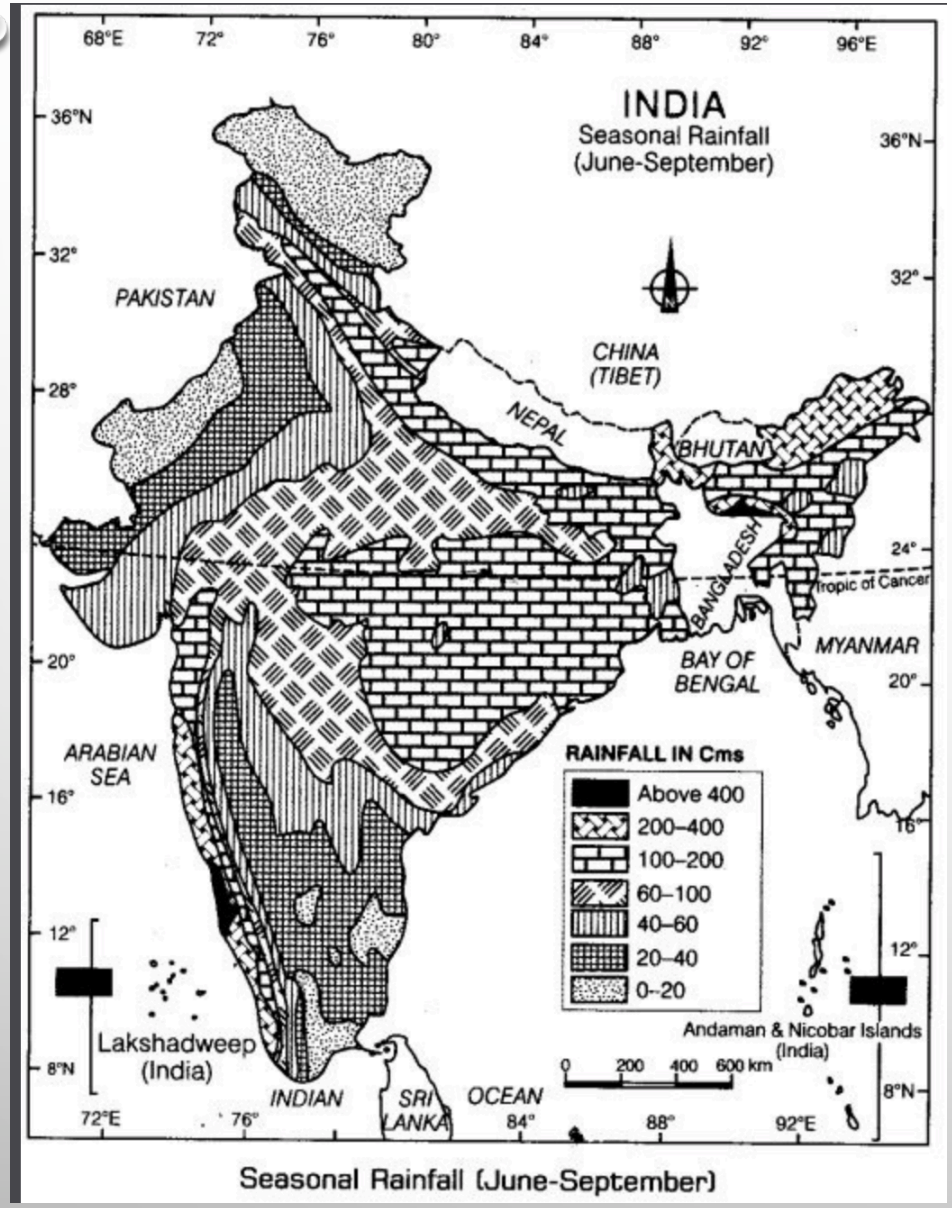
THE LOW-PRESSURE AREA OVER THE NORTHERN PLAINS INTENSIFIES BY MID-JUNE AND ATTRACTS THE TRADE WINDS. THESE TRADE WINDS ORIGINATE OVER THE WARM TROPICAL OCEAN IN THE SOUTHERN HEMISPHERE. AFTER CROSSING THE EQUATOR, THESE BLOW IN THE SOUTH-WEST DIRECTION, ENTERING THE PENINSULA AS THE SOUTH-WEST MONSOON. IN JUST OVER A MONTH, THE MONSOON SYSTEM COVERS THE ENTIRE SUB-CONTINENT, EXCEPT THE EXTREME NORTH-WEST. .

- **RAINFALL IN THE WESTERN GHATS AND DECCAN PLATEAU**
  A TOTAL CHANGE IN WEATHER IS BROUGHT ABOUT BY THE INFLOW OF THE SOUTH-WEST MONSOON IN INDIA. THE WINDWARD SIDE OF THE WESTERN GHATS RECEIVES VERY HEAVY RAINFALL; MORE THAN 250 CM IN THE EARLY SEASON. DESPITE LYING IN A RAIN-SHADOW AREA, THE DECCAN PLATEAU AND PARTS OF MADHYA PRADESH ALSO RECEIVE SOME AMOUNT OF RAINFALL.

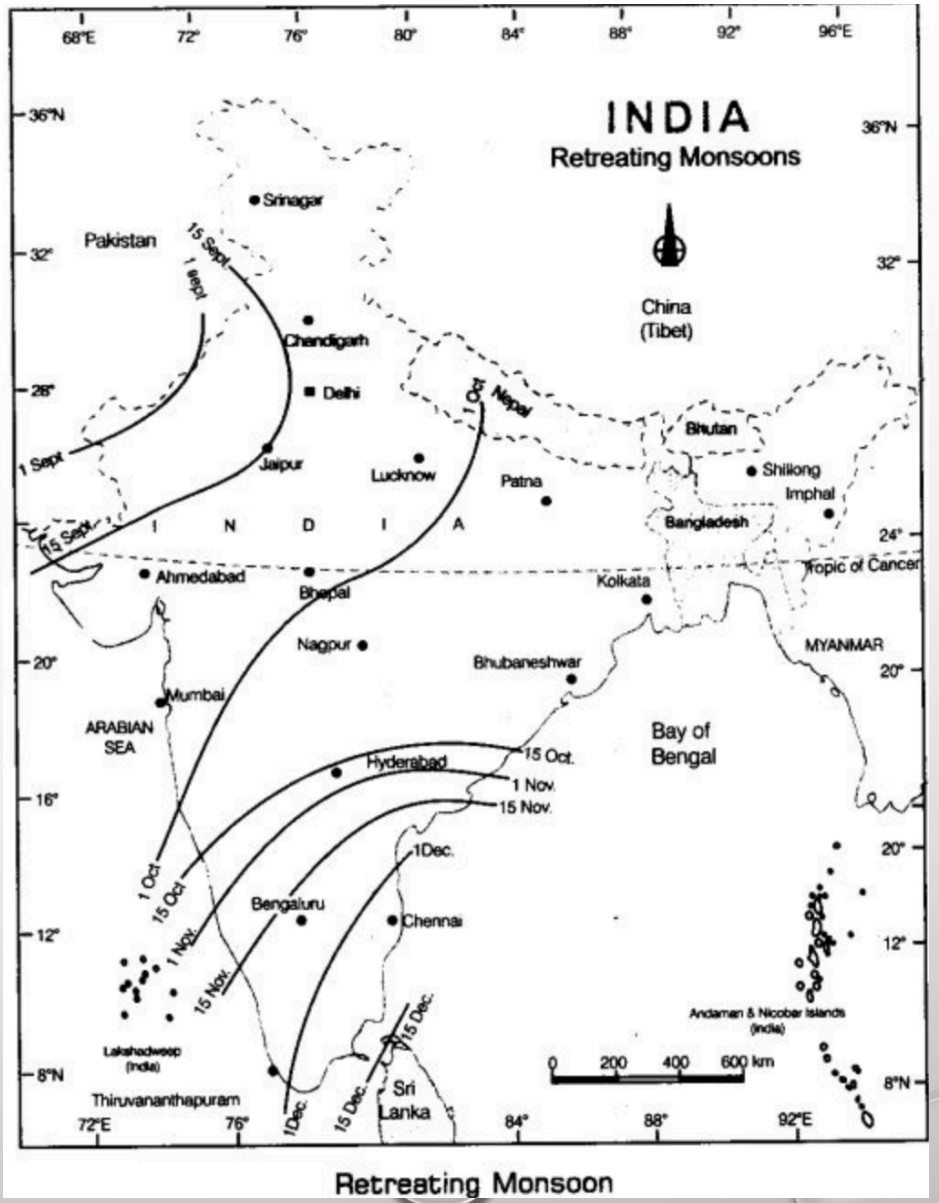
- **AREAS OF MAXIMUM AND LEAST RAINFALL**
  THE MAXIMUM RAINFALL OF THIS SEASON IS RECEIVED BY THE NORTH-EASTERN PART OF THE COUNTRY. THE HIGHEST AVERAGE RAINFALL IN THE WORLD FALLS AT MAWSYNRAM IN THE SOUTHERN RANGES OF THE KHASI HILLS IN MEGHALAYA.
  IN THE NORTHERN PLAINS PRECIPITATION DECREASES FROM EAST TO WEST, WITH THE WESTERN PARTS OF RAJASTHAN AND THE NORTHERN PARTS OF GUJARAT GETTING THE LEAST RAINFALL.

- **FEATURES OF ADVANCING MONSOON:**
  WET AND DRY SPELLS, THE MONSOON TROUGH, AND TROPICAL DEPRESSIONS.

THE MONSOON



Seasonal Rainfall (June-September)



Retreating Monsoon

HANDOUT FOR CLIMATE
MODULE 2 (P1/2)

- MONSOONS ARE PULSATING IN NATURE AND ARE AFFECTED BY DIFFERENT ATMOSPHERIC CONDITIONS. THEY ARE ABOUT 100-120 DAYS IN DURATION, AND OCCUR JUNE-SEPT.
- THE ARABIAN SEA BRANCH AND BAY OF BENGAL BRANCH ARE ***THE TWO BRANCHES OF SOUTH-WEST MONSOON*** IN INDIA.
- THE ***ARABIAN SEA BRANCH*** OF THE MONSOON CAUSES RAINFALL IN THE WESTERN GHAT, MUMBAI, GUJARAT AND CENTRAL INDIA.
- THE ***BAY OF BENGAL BRANCH*** OF THE MONSOON CAUSES RAINFALL IN NORTH-EAST INDIA AND THE GANGA PLAIN.
- AROUND THE TIME OF THE ARRIVAL OF THE MONSOON, A SUDDEN AND CONSTANT RAINFALL, ALONG WITH VIOLENT THUNDER AND LIGHTNING IS CALLED THE ***BURST*** *OF THE MONSOON*.
- THE ***FOUR-MAIN SEASONS IN INDIA*** ARE: THE COLD WEATHER SEASON (WINTER), THE HOT WEATHER SEASON (SUMMER), THE ADVANCING MONSOONS (THE RAINY SEASON), AND THE RETREATING/POST MONSOONS (THE TRANSITION SEASON).
- THE **COLD WEATHER SEASON *IS MARKED BY*** A CLEAR SKY, LOW TEMPERATURES, LOW HUMIDITY AND A FEEBLE, VARIABLE WIND.
- DUE TO THE MODERATING INFLUENCE OF THE SEA, **THE PENINSULAR REGION** DOES NOT HAVE A WELL-DEFINED COLD SEASON, NOR ANY NOTICEABLE CHANGE IN TEMPERATURE.
- THE SMALL AMOUNT OF WINTER RAINFALL, DUE TO AN INFLOW OF CYCLONIC DISTURBANCES FROM THE WEST AND THE NORTH-WEST, IS LOCALLY KNOWN AS '***MAHAWAT***,' AND IS USEFUL IN THE CULTIVATION OF THE RABI OR WINTER CROPS.
- THE ***MAIN FEATURES OF THE*** **HOT WEATHER SEASON** ARE: SUBSTANTIALLY HIGH TEMPERATURES IN THE NORTH, A LOWERING OF ATMOSPHERIC PRESSURE, DUST STORMS, AND HOT, GUSTY, DRY WINDS; LOCALIZED THUNDERSTORMS ALSO OCCUR.
- ***DUST STORMS*** IN NORTH INDIA OCCUR IN THE MONTH OF MAY AND CAN BRING TEMPORARY RELIEF FROM THE HEAT BY *LOWERING THE TEMPERATURE* AS THEY CAN BRING LIGHT RAIN AND A COLD BREEZE.

HANDOUT FOR CLIMATE
MODULE 2 (P2/2)

- THE "***LOO***" IS HOT, DRY, AND STRONG WIND THAT CAN CAUSE DEATH IN CASES OF PROLONGED EXPOSURE. IT BLOWS DURING THE DAY OVER NORTH AND NORTH-WESTERN INDIA IN THE SUMMER OR HOT WEATHER SEASON.
- ***KAAL BAISAKHI*** IS A LOCALIZED THUNDER STORM IN WEST BENGAL. IT OCCURS IN THE HOT SUMMER SEASON BUT IS ASSOCIATED WITH VIOLENT WINDS, TORRENTIAL DOWNPOURS AND QUITE OFTEN, HAIL.
- THE PRE-MONSOON SHOWER THAT OCCURS TOWARD THE END OF THE SUMMER SEASON IN THE COASTAL AREAS OF KARNATAKA AND KERALA ARE OFTEN CALLED, ***"MANGO SHOWERS"*** BECAUSE THEY HELP IN THE EARLY RIPENING OF MANGOES.
- ***MAXIMUM RAINFALL*** DURING THE MONSOON OCCURS IN THE NORTHEAST, MAINLY MEGHALAYA AND ASSAM, AND THE WINDWARD SIDE OF THE WESTERN GHATS (THIRUVANANTHAPURAM TO MUMBAI).
- ***MINIMUM RAINFALL*** OCCURS IN THE WESTERN PARTS OF RAJASTHAN AND THE NORTHERN PARTS OF GUJARAT.
- FEATURES OF THE ***ADVANCING MONSOON*** *ARE*: MONSOON RAINS OCCUR IN WET AND DRY SPELLS; EFFECTS OF THE MONSOON TROUGH, AND TROPICAL DEPRESSIONS.
- THE RAINLESS INTERVALS INTERSPERSING THE MONSOON ARE CALLED "***BREAKS"*** *IN THE MONSOON.*'
- THE ***MONSOON TROUGH*** IS THE INTENSE AND ELONGATED LOW-PRESSURE AREA, WHICH DEVELOPS OVER NORTH-WESTERN INDIA. IT EXTENDS FROM THE THAR DESERT IN THE WEST TO THE CHOTA NAGPUR PLATEAU IN THE EAST. IT'S MOVEMENT DETERMINES THE SPATIAL DISTRIBUTION OF RAINFALL.
- ***TROPICAL DEPRESSIONS*** FOLLOW THE AXIS OF THE 'MONSOON TROUGH OF LOW PRESSURE' AND DETERMINE THE AMOUNT AND DURATION OF THE MONSOON RAINS BY THEIR FREQUENCY AND INTENSITY.

CLIMATE MODULE 2
WORKSHEET 2

1. EXPLAIN THE FOUR FEATURES OF THE MONSOON RAIN
2. WHAT ARE THE FOUR MAIN SEASONS OF INDIA?
3. DIFFERENTIATE BETWEEN THE COLD WEATHER SEASON AND THE HOT WEATHER SEASON OF INDIA BY EXPLAINING THREE DISTINCTIVE FEATURES OF EACH
4. WRITE IN BRIEF ABOUT THE MECHANISM OF THE MONSOON
5. WHY IS THE SOUTH WEST MONSOON LESS RAINY IN TAMIL NADU?
6. DEFINE & DESCRIBE THE FOLLOWING:

- A. BURST OF MONSOON
- B. MAHAWAT
- C. MANGO SHOWERS
- D. CONTINENTALITY
- E. DUST STORMS
- F. LOO