

**NATIONAL WEATHER FORECASTING CENTRE**  
**MONTHLY WEATHER SUMMARY (CABINET SUMMARY)**  
**FOR THE PERIOD 01.10.2024 TO 31.10.2024**

**1. Updated Long Range Forecast for the Southwest Monsoon Season 2024 (June-September) Rainfall and Monthly Rainfall and Temperature Outlook for October 2024:**

IMD released the Long Range Forecast for the Rainfall during Post-monsoon Season 2024 and Rainfall and Temperature during October 2024 on 1 Oct 2024.

- a) Rainfall averaged over the South Peninsular India consisting of five meteorological subdivisions (Tamil Nadu, Puducherry and Karaikal, Coastal Andhra Pradesh, Rayalaseema, Kerala and Mahe, and South Interior Karnataka) **is most likely to be above normal (>112% of Long Period Average (LPA)) during post-monsoon season (October-December, 2024)**. Normal to Above-normal rainfall is likely over many areas of central India, south peninsular India, and some parts of northeast India during the same period. However, most parts of northwest India, and some parts of northeast India and southernmost parts of India are likely to receive below-normal rainfall.
- b) During October 2024, most parts of India are likely to receive normal to above normal rainfall in October 2024. However, some parts of northeast and Northwest India and a few pockets in the south peninsula are likely to experience below normal rainfall. Monthly rainfall over the country as a whole during October 2024 **is most likely to be above normal >115 % of LPA**.
- c) In October, above-normal maximum temperatures are likely over most parts of the country except some parts from central India and adjoining south peninsula where normal to below normal maximum temperatures are likely. During October above-normal minimum temperatures are likely over most parts of the country.
- d) Currently, neutral El Niño-Southern Oscillation (ENSO) conditions are observed over the equatorial Pacific Ocean with below average sea surface temperatures in the east equatorial Pacific Ocean. The probability forecast indicates a higher chance of development of La Niña conditions during Post-Monsoon season, 2024.
- e) Above-average sea surface temperatures (SSTs) are currently seen across most of the Indian Ocean. Currently, neutral Indian Ocean Dipole (IOD) conditions prevail over the Indian Ocean. The latest MMCFS forecast indicates that the neutral IOD conditions are likely to continue during post-monsoon season, 2024.

**2. Major Weather systems during the month and Forecast performances**

A total of four Low Pressure Systems formed during the month. Out of which, two became depression, one Severe Cyclonic Storm and one Low pressure Area. A total of 19 LPS days was observed during the month. During the month, it was back to back depressions over Arabian Sea (13-15 Oct) and Bay of Bengal (15-17 Oct) and formed and moved during the withdrawal phase of southwest monsoon. Both systems moved nearly northwestwards movement and crossed coasts. Both systems were well predicted by IMD 2 weeks in advance.

**2.1 Depression over Central Arabian Sea (13th – 15th October)**

A cyclonic circulation lay over South Kerala & neighbourhood in the morning (0830 hours IST) of the 7th October, 2024. Under its influence, a Low Pressure Area formed over Lakshadweep and adjoining southeast & eastcentral Arabian Sea in the morning (0830 hours IST) of the 9th October, 2024. It lay as a Well Marked Low Pressure Area over eastcentral Arabian Sea off Karnataka-Goa coasts in the morning (0830 hours IST) of the 10th October 2024. It intensified into a Depression in the evening (1730 hours IST) of the 13th October, 2024 over central Arabian Sea. It moved northwestwards and crossed Oman coast near latitude 19.35°N and longitude 57.7°E, close to Duqm (Oman) between 2230 hours IST and 2330 hours IST. It then weakened and lay as a Well Marked Low Pressure Area over coastal Oman in the same midnight (2330

hours IST), the 15th October, 2024. India Meteorological Department monitored the system since 10<sup>th</sup> October. The formation of the system was first indicated in the extended range outlook issued on 10th October (3 days prior to formation of depression). With High probability (67-100%), it was indicated that the Well Marked Low Pressure over eastcentral Arabian Sea would intensity into a Depression over central Arabian Sea and would move nearly west-northwestwards. Actually, depression formed on central Arabian Sea on 13th October. No adverse weather was observed in association with this system. Observed track of the depression is presented in Fig.1.

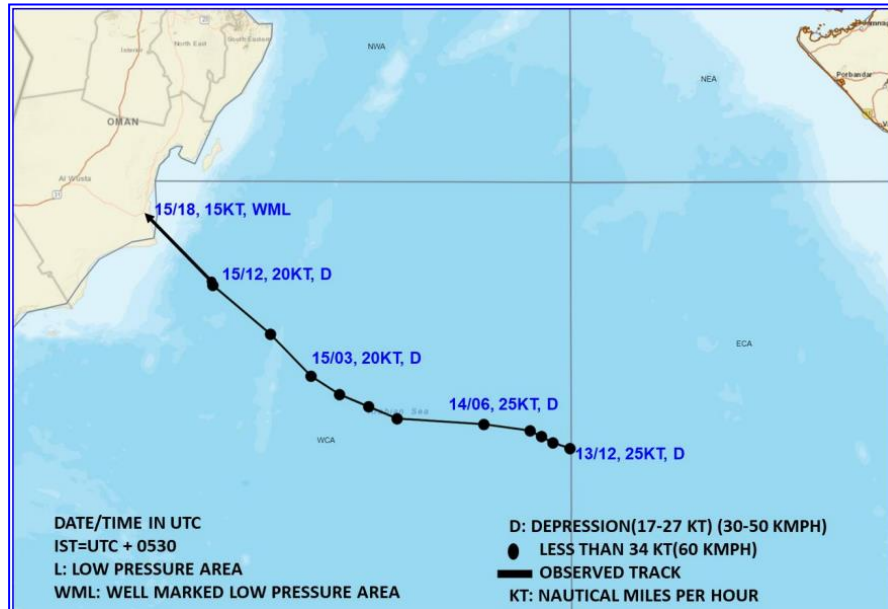


Fig. 1: Observed Track of Depression over Central Arabian Sea during 13<sup>th</sup> to 15<sup>th</sup> October, 2024

## 2.2 Depression over southwest Bay of Bengal (15th – 17th October)

A cyclonic circulation lay over southeast Bay of Bengal and adjoining North Equatorial Indian Ocean in the morning (0830 hours IST) of the 12th October, 2024. It moved west-northwestwards. Under its influence, a Low Pressure Area formed over southeast Bay of Bengal in the early morning (0530 hours IST) of the 14th October 2024. It lay as a Well Marked Low Pressure Area over the central parts of south Bay of Bengal in the early morning (0530 hours IST) of 15th October 2024. It intensified into a Depression over southwest Bay of Bengal in the same evening (1730 hours IST). It moved west-northwestwards and crossed north Tamil Nadu - South Andhra Pradesh coasts between Puducherry and Nellore, close to north of Chennai, near latitude 13.5N and longitude 80.2E around 0430 hrs IST of today, the 17th October. Subsequently, it weakened into a Well Marked Low Pressure Area and lay over South coastal Andhra Pradesh and adjoining North coastal Tamil Nadu in the early morning (0530 hrs IST) of today, the 17th October, 2024. India Meteorological Department monitored the system. The extended range outlook issued on 10th October (5 days prior to formation of the depression) indicated likely formation of an upper-air cyclonic circulation over central parts of south Bay of Bengal around 12th October. The system caused intense rainfall activity over Tamil Nadu, Puducherry & Karaikal, Rayalseema, Coastal Andhra Pradesh & Yanam, South Interior Karnataka and parts of Kerala on 15<sup>th</sup> and 16<sup>th</sup> October. The observed track of the depression is presented in Fig.2.

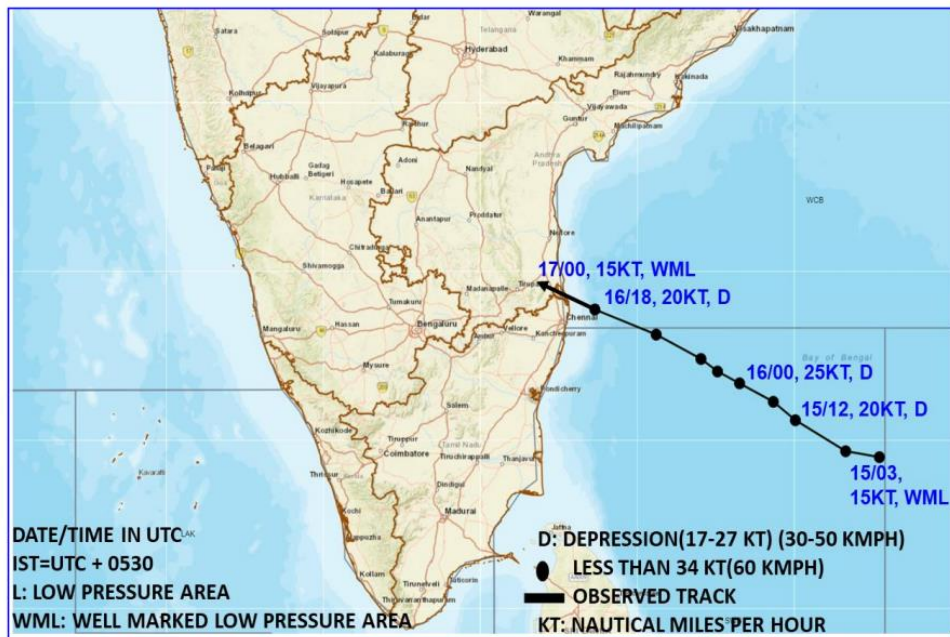


Fig. 2: Observed Track of Depression over Southwest Bay of Bengal during 15<sup>th</sup> to 17<sup>th</sup> October, 2024

### 2.3 Severe Cyclonic Storm “DANA” over Eastcentral Bay of Bengal during 22-26 October, 2024

The severe cyclonic storm “DANA” developed over eastcentral Bay of Bengal (BoB) and adjoining North Andaman Sea as a **Low-Pressure Area**. It moved nearly north-northwestwards, intensified into a **depression** over eastcentral BoB on 22<sup>nd</sup> October, **cyclonic storm “DANA”** on 23<sup>rd</sup> October and into a **severe cyclonic storm** over central & adjoining northwest BoB in the mid-night (2330 hours IST/1800 UTC) of 23<sup>rd</sup> October, 2024. It reached its peak intensity on 24<sup>th</sup> October and **crossed north Odisha coast close to Habalikhati Nature Camp (Bhitarkanika) and Dhamara during 0130 hrs IST to 0330 hrs IST of 25<sup>th</sup> October (2000 to 2200 UTC of 24<sup>th</sup> October) as a severe cyclonic storm with a wind speed of 100-110 kmph gusting to 120 kmph**. It moved slowly during and after landfall. The landfall process continued for 9 hours during midnight of 24<sup>th</sup> till morning of 25<sup>th</sup> October. After landfall, it weakened rapidly into a cyclonic storm over north coastal Odisha in the forenoon of 25<sup>th</sup> and into a well marked low pressure over interior Odisha in the early morning of 26<sup>th</sup> October. India Meteorological Department (IMD) provided 1<sup>st</sup> information about the likely development of depression around 23<sup>rd</sup> October and its intensification into a cyclonic storm over eastcentral BoB in the extended range outlook issued on 17<sup>th</sup> October (about 7.5 days ahead of landfall). There was almost zero error in cyclone landfall point, landfall time and landfall intensity prediction for all lead periods of forecast upto 3.5 days. The operational track and intensity forecast errors were markedly less than the long period average (LPA) errors based on last five years (2019-2023) for all lead periods of forecast. The track forecast errors were 20-30 km and the intensity forecast errors were 2-5 kt (3-10 kmph) upto 72 hours lead periods. The observed track of the system is given in Fig. 3.

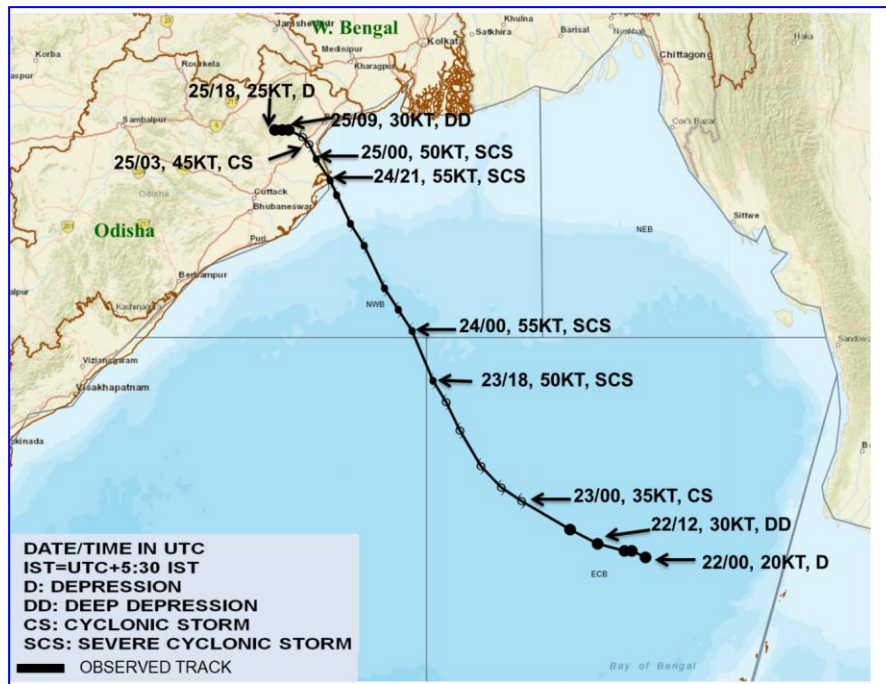


Fig. 3: Observed track of severe cyclonic storm “DANA)” over eastcentral Bay of Bengal during 22-26 October, 2024

### 3. Withdrawal of southwest monsoon from the country:

Southwest monsoon withdrew from entire country on 15<sup>th</sup> October against the normal date of 15<sup>th</sup> October. While withdrawal from the country normally starts on 17 September, this year it commenced on 23<sup>rd</sup> September. Northeast Monsoon rainfall activity has commenced over southeast Peninsula on 15<sup>th</sup> October, 2024. The withdrawal dates of the Southwest monsoon season 2024 with its normal dates are shown in Fig. 4.

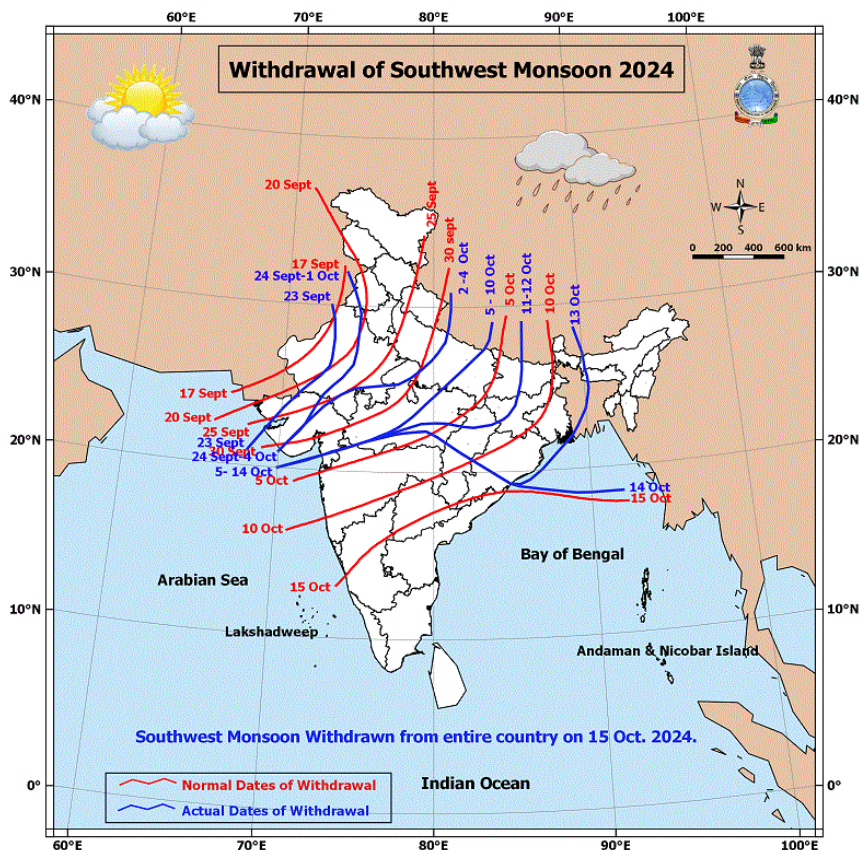


Fig.4: Isochrones of withdrawal of Southwest Monsoon 2024.

#### 4. Rainfall Scenario

The Rainfall over the country as a whole for the month of October 2024 was 75.7 mm which is very closed to its Long Period Average (LPA) of 75.4 mm The rainfall statistics for the month of October 2024 for 4 homogeneous regions and the country as a whole is given In the Table-1 below;

**Table 1: The monthly rainfall for October 2024 is given in the table below:**

Regions	Actual Rainfall (mm)	Normal Rainfall (mm)	% Departure from LPA
Country as a whole	75.7	75.4	0.4
Northwest India	5.2	21.6	-75.8
Central India	54.0	57.0	-5.3
South Peninsula	170.3	152.3	11.8
East & northeast India	140.8	123.2	14.3

In terms of Met Sub-division-wise categorized rainfall, out of 36 Met Sub-divisions, 04 in Large Excess (LE), 07 in Excess(E), 08 in Normal (N), 09 in Deficient (D) and 08 in Large Deficient (LD) category of rainfall (refer Table-2 and the figure 5below);

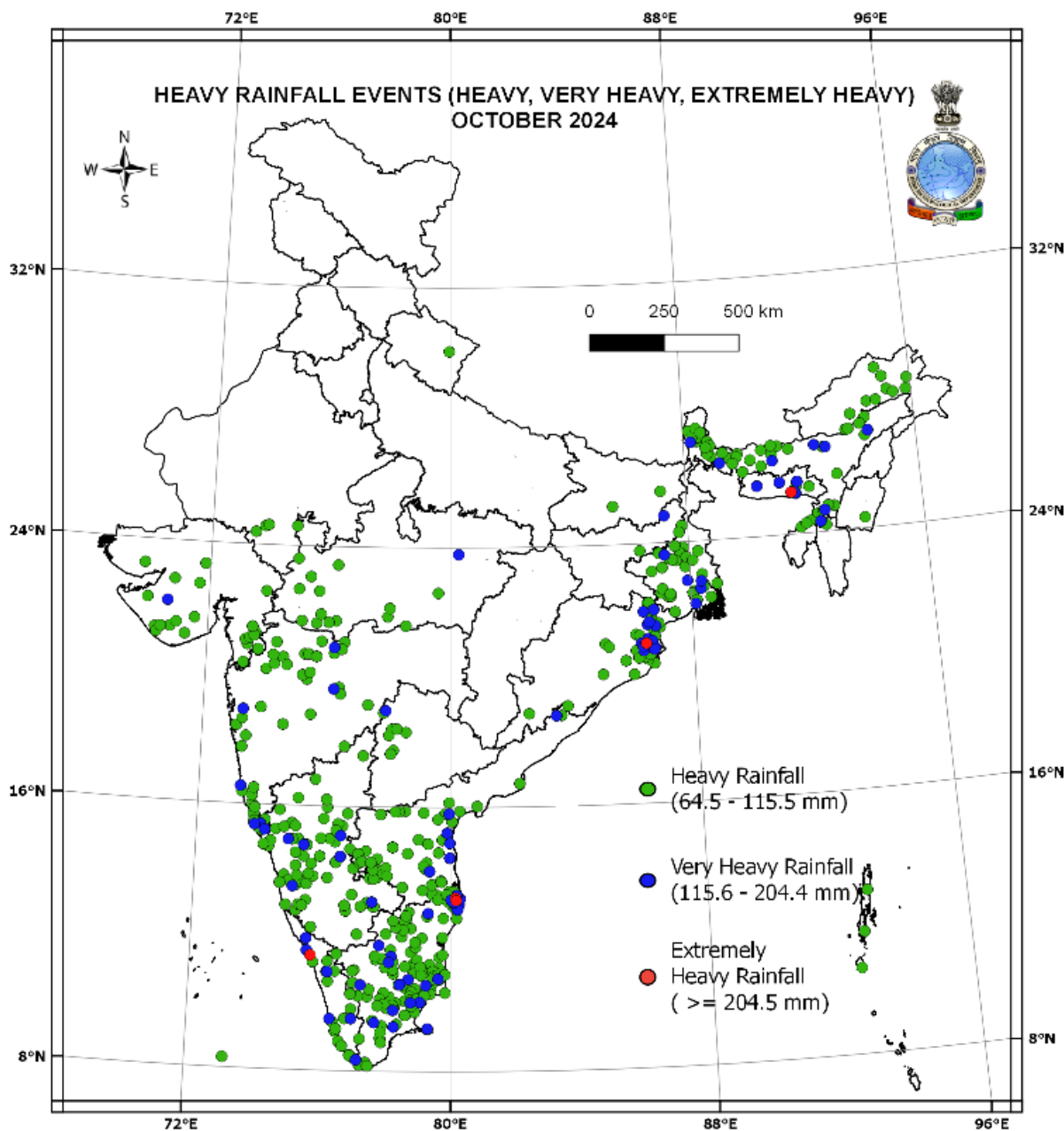
<b>Table-2</b>						
<b>S. NO.</b>	<b>METEOROLOGICAL SUBDIVISIONS</b>	<b>PERIOD:</b>		<b>01.10.2024</b>	<b>TO</b>	<b>31.10.2024</b>
		<b>ACTUAL</b>	<b>NORMAL</b>	<b>% DEP.</b>	<b>CAT.</b>	
<b>EAST &amp; NORTH EAST INDIA</b>		<b>140.8</b>	<b>123.2</b>			<b>14%</b>
1	ARUNACHAL PRADESH	259.6	169.7	53%		E
2	ASSAM & MEGHALAYA	200.3	153.1	31%		E
3	N M M T	102.6	150.7	-32%		D
4	SHWB & SIKKIM	164.5	142.7	15%		N
5	GANGETIC WEST BENGAL	199.3	135.3	47%		E
6	JHARKHAND	60.7	73.4	-17%		N
7	BIHAR	19.5	57.2	-66%		LD
<b>NORTH WEST INDIA</b>		<b>5.2</b>	<b>21.6</b>			<b>-76%</b>
1	EAST U.P.	3.1	33.6	-91%		LD
2	WEST U.P.	0.3	20.7	-99%		LD
3	UTTARAKHAND	2.9	31.0	-91%		LD
4	HAR. CHD & DELHI	0.5	9.6	-95%		LD
5	PUNJAB	2.4	8.1	-70%		LD
6	HIMACHAL PRADESH	0.7	25.1	-97%		LD
7	J & K AND LADAKH	8.7	33.1	-74%		LD
8	WEST RAJASTHAN	4.5	7.6	-41%		D
9	EAST RAJASTHAN	11.4	15.0	-24%		D
<b>CENTRAL INDIA</b>		<b>54.0</b>	<b>57.0</b>			<b>-5%</b>
1	ODISHA	72.2	112.0	-36%		D
2	WEST MADHYA PRADESH	34.9	29.5	18%		N
3	EAST MADHYA PRADESH	16.8	36.6	-54%		D
4	GUJARAT REGION	41.1	22.1	86%		LE
5	SAURASHTRA & KUTCH	49.8	18.1	175%		LE

6	KONKAN & GOA	215.6	116.4	85%	LE
7	MADHYA MAHARASHTRA	101.3	77.9	30%	E
8	MARATHWADA	71.7	74.0	-3%	N
9	VIDARBHA	41.6	57.8	-28%	D
10	CHHATTISGARH	25.6	60.4	-58%	D
<b>SOUTH PENINSULA</b>		<b>170.3</b>	<b>152.3</b>	<b>12%</b>	
1	A & N ISLAND	295.1	284.6	4%	N
2	COASTAL A. P. & YANAM	160.8	182.2	-12%	N
3	TELANGANA	60.5	95.8	-37%	D
4	RAYALASEEMA	194.2	132.1	47%	E
5	TAMIL., PUDU. & KARAICAL	214.2	172.0	25%	E
6	COASTAL KARNATAKA	232.9	192.9	21%	E
7	N. I. KARNATAKA	122.3	103.2	19%	N
8	S. I. KARNATAKA	224.3	137.2	64%	LE
9	KERALA & MAHE	239.6	306.4	-22%	D
10	LAKSHADWEEP	169.5	153.0	11%	N
<b>COUNTRY AS A WHOLE</b>		<b>75.7</b>	<b>75.4</b>	<b>0%</b>	



Fig 5: Subdivision-wise rainfall distribution for October 2024.

**Heavy Rainfall Events:** The locations of heavy/very heavy/extremely heavy rainfall events occurred in this month are given in the figure below (**Fig.6**);



**Fig.6 Heavy/Very Heavy/Extremely Heavy Rainfall Events, October2024**

During October heavy rainfall events were confined mainly over East & northeast India and some parts of peninsular Indian region. October 2024 witnessed Extremely very heavy rainfall events ( $\geq 204.4$  mm) mainly over Assam & Meghalaya, Odisha, Tamilnadu, Puducherry&Karaikal and Kerala &Mahe, very heavy rainfall events (115.6 – 204.4 mm) and heavy rainfall events (64.5 – 115.5 mm) were observed mainly over East & northeast India, east central parts, peninsular India and west central parts.

**Major heavy rainfall event of Sept which caused severe impacts were:**

- a) Extremely Heavy Rainfall over occurred over Assam & Meghalaya on 4th and 5th October.
- b) Extremely heavy rainfall occurred over Tamil Nadu, Puducherry&Karaikal and Rayalaseema on 16<sup>th</sup> October and North Odisha on 26<sup>th</sup> October.

c) Under the influence of Severe Cyclonic Storm “DANA” which crossed north Odisha coast, very heavy to extremely heavy rainfall was observed at isolated places over Odisha on 25th & 26th October. Heavy to very heavy rainfall was observed over Gangetic West Bengal on 25th & 26th October, Jharkhand on 26th October. Extremely heavy rainfall was observed at isolated places over Odisha on 26th October. Heavy to Very Heavy Rainfall was observed at isolated places over Odisha on 25th, 28 to 30 October; Gangetic West Bengal on 25th and 26th October; Coastal Andhra Pradesh on 28th October; Odisha on 25th October and Coastal Andhra Pradesh on 28th October.

**Meteorological Sub-division wise number of days with Heavy / Very Heavy / Extremely Heavy Rainfall events occurred during the month is given below in Table 3:**

<b>Table 3: Number of Days with Heavy(H), Very Heavy(VH) &amp; Extremely Heavy (EH) Rainfall</b>			
<b>October 2024</b>			
<b>Met. Sub-divisions</b>	<b>HRF</b>	<b>VH RF</b>	<b>EH RF</b>
Andaman & Nicobar Islands	2	0	0
Arunachal Pradesh	5	0	0
Assam & Meghalaya	6	4	1
Nagaland, Manipur, Mizoram & Tripura	4	0	0
Sub-Himalayan West Bengal & Sikkim	9	2	1
Gangetic West Bengal	5	2	0
Odisha	7	2	1
Jharkhand	4	2	0
Bihar	4	0	0
East Uttar Pradesh	0	0	0
West Uttar Pradesh	0	0	0
Uttarakhand	1	0	0
Haryana, Chandigarh & Delhi	0	0	0
Punjab	0	0	0
Himachal Pradesh	0	0	0
Jammu & Kashmir	0	0	0
West Rajasthan	0	0	0
East Rajasthan	1	0	0
West Madhya Pradesh	6	0	0
East Madhya Pradesh	2	1	0
Gujarat Region	7	0	0
Saurashtra & Kutch	5	1	0
Konkan & Goa	6	2	0
Madhya Maharashtra	9	0	0
Marathwada	3	1	0
Vidarbha	2	1	0
Chhattisgarh	1	0	0
Coastal Andhra Pradesh & Yanam	6	3	0
Telangana	4	1	0
Rayalaseema	10	1	1
Tamilnadu, Puducherry & Karaikal	15	11	1
Coastal Karnataka	8	1	0
North Interior Karnataka	7	1	0
South Interior Karnataka	13	2	0
Kerala & Mahe	10	4	1



Lakshadweep	1	0	0
<b>LEGEND</b>			
Heavy Rainfall-226	64.5 mm To 115.5 mm OR $\geq 7$ cm & $\leq 11$ cm		
Very Heavy Rainfall-94	115.6 mm To 204.4 mm OR $\geq 12$ cm & $\leq 20$ cm		
Extremely Heavy Rainfall-27	$>204.4$ mm OR $\geq 21$ cm		

Number of Heavy/Very Heavy Rainfall Events ( $>64.4$ mm) and Warning Skill (correctness in %) for heavy rainfall for the month of **October 2024** is given in Table 4:

<b>Table 4</b>	
<b>Warning issued for</b>	<b>No. of Heavy/Very Heavy Rainfall Events (<math>&gt;64.4</math> mm): 205</b>
	<b>Percentage correct (in %) for Rainfall <math>&gt;64.4</math>mm</b>
Day1/24Hours	83
Day2/48Hours	84
Day3/72Hours	84

## 5. Temperature Scenario

The average maximum, average minimum and mean temperature for the country as a whole during October 2024 were  $32.05^{\circ}\text{C}$ ,  $21.79^{\circ}\text{C}$  and  $26.92^{\circ}\text{C}$  respectively, against the normal of  $31.37^{\circ}\text{C}$ ,  $20.01^{\circ}\text{C}$  and  $25.69^{\circ}\text{C}$  based on data of 1991-2020. Thus, the average maximum, average minimum and mean temperatures were above normal with departure from normal of  $0.68^{\circ}\text{C}$ ,  $1.78^{\circ}\text{C}$  and  $1.23^{\circ}\text{C}$  respectively for the country as a whole.

Over the country during October, the average maximum temperature was  $32.05^{\circ}\text{C}$  with departure from normal of  $0.68^{\circ}\text{C}$  (7th highest since 1901). The average minimum temperature was highest at  $21.79^{\circ}\text{C}$  since 1901 against the earlier record of  $21.28^{\circ}\text{C}$  in 1951. The mean temperature was highest at  $26.92^{\circ}\text{C}$  since 1901 against the earlier record of  $26.71^{\circ}\text{C}$  in 1951.

The highest maximum temperature of  **$41.3^{\circ}\text{C}$**  had been recorded at **Pokhran (West Rajasthan)** on **28<sup>th</sup>October 2024** and the lowest minimum temperature of  **$15.2^{\circ}\text{C}$**  had been recorded at **Delhi Ridge (New Delhi), Hissar(Haryana) and Bhopal(West Madhya Pradesh)** on **26<sup>th</sup> October 2024** over the plains of the country during the month.

## 6. Thunderstorm activity during the month in Table 5 (Reported by RMCs/RFCs/MCs):

<b>Table 5</b>		
<b>S. No.</b>	<b>Met Sub-Division</b>	<b>Thunderstorms Days</b>
1.	Andaman & Nicobar Islands	6
2.	Arunachal Pradesh	3
3.	Assam & Meghalaya	11
4.	Nagaland, Manipur, Mizoram & Tripura	13
5.	Sub-Himalayan West Bengal & Sikkim	7
6.	Gangetic West Bengal	22
7.	Odisha	21
8.	Jharkhand	11
9.	Bihar	3
10.	East Uttar Pradesh	4
11.	West Uttar Pradesh	0
12.	Uttarakhand	0
13.	Haryana Chandigarh & Delhi	2
14.	Punjab	1
15.	Himachal Pradesh	2
16.	Jammu & Kashmir And Ladakh	2
17.	West Rajasthan	3

18.	East Rajasthan	2
19.	West Madhya Pradesh	7
20.	East Madhya Pradesh	3
21.	Gujarat Region	13
22.	Saurashtra & Kutch	12
23.	Konkan & Goa	10
24.	Madhya Maharashtra	16
25.	Marathawada	3
26.	Vidarbha	8
27.	Chhattisgarh	12
28.	Coastal Andhra Pradesh & Yanam	26
29.	Telangana	18
30.	Rayalaseema	18
31.	Tamilnadu Puducherry & Karaikal	26
32.	Coastal Karnataka	11
33.	North Interior Karnataka	21
34.	South Interior Karnataka	21
35.	Kerala & Mahe	21
36.	Lakshadweep	0

## **7. Bulletins/Warnings/Press Releases Issued:**

- All India Weather Bulletins:-124
- All India inference and severe weather warnings:-124
- All India Weekly Weather Reports:-5
- Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 31
- Daily Warnings for Fishermen in North Indian Ocean for next 5 days: 31
- Fleet Forecast for Indian Navy for next 12 hours: 62
- Bulletins for ships in deep sea under Global Maritime Distress Safety System for next 36 hours: 62
- Mountain weather bulletins issued for western and central Himalayan region: 62
- Expedition Forecast bulletins issued for Mt. Satopanth expedition by Army Adventure Wing: 07
- Expedition Forecast bulletins issued for Mt. Nanda Ghunti expedition by Indian Navy: 15
- Expedition Forecast bulletins issued for Mt Khangchengyao Expedition by Indian Army: 04
- Nowcast Guidance Bulletins for Severe Weather: 31
- FDP STORM Bulletins: 31
- Current Temperature Status and Heat Wave Warning bulletins: 31
- Press Releases issued during the month: 42
- Daily Tropical Weather Outlook with cyclogenesis forecast for next 7 days: 21
- Daily Severe Weather Guidance for next 5 days under Severe Weather Forecasting Programme: 31
- Weekly Extended Range Outlook for Cyclogenesis for next 2 weeks: 5
- Daily Warnings for Fishermen in North Indian Ocean for next 5 days: 45
- Fleet Forecast for Indian Navy for next 12 hours: 58
- Bulletins for ships in deep sea under Global Maritime Distress Safety System for next 39 hours: 58