



Weather in India

POST MONSOON SEASON (October-December 2021)[†]

1. Introduction

Post monsoon season 2021 witnessed the formation of four intense low-pressure systems in the north Indian ocean (NIO) comprising of the Bay of Bengal and the Arabian sea. The four systems included three Depressions (all 3 in the month of November) and one Cyclonic Storm “JAWAD” (2 December - 5 December) over the Bay of Bengal, which gradually weakened into a low-pressure area over the northwest Bay of Bengal on 6 December encountering unfavourable conditions.

The southwest monsoon withdrew from the entire country on 25 October 2021 (normal date 15 October) and the northeast monsoon season commenced over the south peninsula on the same day against normal date of 20 October and ceased on 22 January 2022.

Northeast monsoon rainfall over the five core regions was *large excess* in Rayalaseema, Kerala & Mahe and South Interior Karnataka, *excess** in Tamil Nadu, Puducherry and Karaikal and *normal* in Coastal Andhra Pradesh and Yanam.

The maximum temperatures were generally *normal* over major parts of the country during the season and *below normal* over some pockets of Northwest India. The minimum temperatures were *normal* over most parts of the country except over Central India and adjoining East India where they were *above normal*.

Severe cold wave / cold wave conditions were observed from the last fortnight of December over parts of Central and Northwest India in the meteorological sub-divisions of Punjab, Haryana, Chandigarh, Delhi, Rajasthan, west Madhya Pradesh, Saurashtra and Kutch, Himachal Pradesh, Chhattisgarh and Odisha.

Very dense fog was observed at isolated places over Punjab, Vidarbha and northwest Madhya Pradesh in the last week of December. Dense to very dense fog was observed from the first week of December at isolated places over Punjab, Haryana, north Rajasthan and

(* Definitions of terms in italics (other than subtitles) are given in Appendix.)

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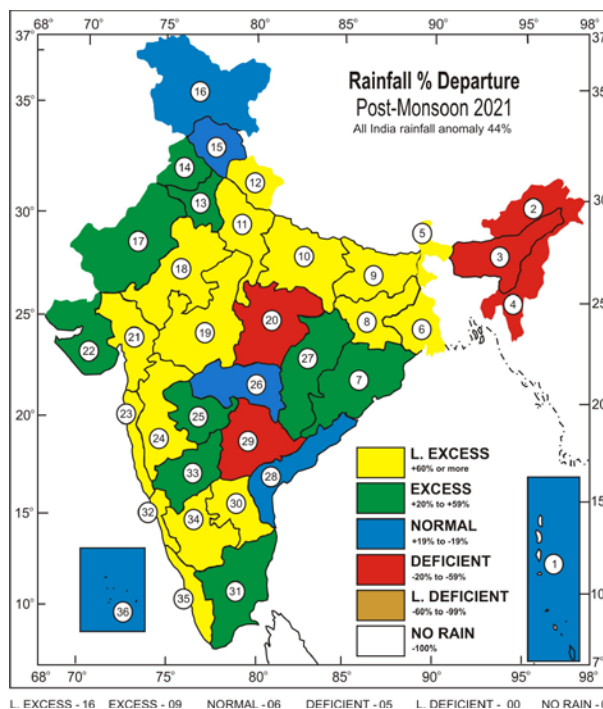


Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for post monsoon season (October to December 2021). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1 15	7 39	13 43	19 83	25 20	31 59
2 -41	8 76	14 32	20 -22	26 -4	32 117
3 -23	9 176	15 -18	21 106	27 20	33 25
4 -31	10 96	16 -8	22 35	28 7	34 145
5 73	11 187	17 28	23 90	29 -24	35 109
6 81	12 263	18 163	24 79	30 110	36 17

northwest Madhya Pradesh. Dense fog was observed at isolated places over east Uttar Pradesh, Himachal Pradesh, Madhya Maharashtra, west Rajasthan, Bihar, Punjab, Jammu-Kashmir and Ladakh.

2. Seasonal rainfall (October-December)

The meteorological sub-division wise rainfall percentage departure from normal are given in Fig. 1 and Table 1.

TABLE 1
Sub-divisionwise rainfall (mm) for each month and season as a whole (October-December, 2021)

S. No.	Meteorological Sub-divisions	October			November			December			Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A. & N. Islands	413.1	282.4	46%	265.7	239.0	11%	95.5	154.4	-38%	774.4	675.8	15%
2.	Arunachal Pradesh	124.6	184.9	-33%	13.9	45.5	-69%	16.8	37.0	-55%	157.2	267.4	-41%
3.	Assam & Meghalaya	137.9	157.6	-12%	3.0	28.0	-89%	10.8	10.9	-1%	151.7	196.5	-23%
4.	Naga., Mani., Mizo. and Tri.	88.9	165.5	-46%	10.6	43.7	-76%	53.5	11.8	353%	152.9	221.0	-31%
5.	Sub-Himalayan West Bengal & Sikkim	291.6	151.5	92%	7.1	17.9	-60%	11.8	10.0	18%	310.6	179.4	73%
6.	Gangetic West Bengal	189.9	127.6	49%	25.9	21.4	21%	67.3	7.4	810%	283.1	156.4	81%
7.	Orissa	80.4	100.2	-20%	53.7	24.5	119%	48.8	6.6	639%	182.9	131.3	39%
8.	Jharkhand	111.7	74.7	50%	24.0	9.0	167%	23.5	6.6	256%	159.3	90.3	76%
9.	Bihar	189.6	61.6	208%	0.0	6.0	-100%	12.0	5.4	123%	201.7	73.0	176%
10.	East Uttar Pradesh	87.4	37.3	134%	0.0	4.1	-99%	6.2	6.3	-1%	93.6	47.7	96%
11.	West Uttar Pradesh	92.0	22.2	315%	0.3	3.8	-91%	1.5	6.7	-77%	93.9	32.7	187%
12.	Uttarakhand	203.2	35.3	476%	1.0	7.2	-86%	15.4	18.0	-14%	219.6	60.5	263%
13.	Haryana, Chandigarh & Delhi	26.1	9.9	164%	0.0	3.8	-99%	2.8	6.5	-57%	28.9	20.2	43%
14.	Punjab	34.6	8.9	288%	0.1	5.2	-97%	0.1	12.2	-99%	34.8	26.3	32%
15.	Himachal Pradesh	56.7	27.5	106%	1.1	20.3	-95%	17.6	43.8	-60%	75.4	91.6	-18%
16.	Jammu & Kashmir and Ladakh	101.0	35.7	183%	4.9	33.4	-85%	16.6	64.4	-74%	122.6	133.5	-8%
17.	West Rajasthan	11.1	6.9	61%	0.9	2.7	-66%	2.8	2.0	42%	14.8	11.6	28%
18.	East Rajasthan	33.3	14.0	138%	26.2	8.0	228%	8.3	3.8	118%	67.8	25.8	163%
19.	West Madhya Pradesh	76.2	29.7	157%	7.1	13.0	-45%	9.9	8.2	21%	93.2	50.9	83%
20.	East Madhya Pradesh	28.7	34.2	-16%	3.0	12.0	-75%	13.0	11.2	16%	44.7	57.4	-22%
21.	Gujarat Region	19.5	17.9	9%	21.8	10.1	116%	19.9	1.8	1008%	61.2	29.8	106%
22.	Saurashtra & Kutch & Diu	28.6	15.8	81%	5.7	10.6	-47%	2.8	1.1	155%	37.0	27.5	35%
23.	Konkan & Goa	116.2	110.5	5%	75.9	23.7	220%	73.8	5.4	1266%	265.8	139.6	90%
24.	Madhya Maharashtra	92.3	73.3	26%	37.7	23.5	61%	50.9	6.3	709%	181.0	103.1	76%
25.	Marathawada	95.9	71.7	34%	16.3	20.5	-20%	7.7	7.8	-1%	120.0	100.0	20%
26.	Vidarbha	56.5	57.6	-2%	5.7	14.8	-61%	15.9	9.1	75%	78.1	81.5	-4%
27.	Chhattisgarh	39.5	59.4	-34%	23.0	10.2	126%	29.4	7.1	314%	91.9	76.7	20%
28.	Coastal Andhra Pradesh & Yanam	98.8	191.3	-48%	245.3	117.3	109%	16.5	29.5	-44%	360.6	338.1	7%
29.	Telangana	59.1	92.4	-36%	33.6	24.2	39%	1.5	6.7	-77%	94.2	123.3	-24%
30.	Rayalaseema	146.4	129.8	13%	302.0	70.2	330%	21.4	23.3	-8%	469.7	223.3	110%
31.	Tamil Nadu, Pudcherry & Karaikal	228.6	177.6	29%	425.3	179.5	137%	60.4	92.6	-35%	714.3	449.7	59%
32.	Coastal Karnataka	289.1	186.0	55%	227.3	59.7	281%	41.0	11.1	269%	557.4	256.8	117%
33.	North Interior Karnataka	87.9	105.9	-17%	72.4	26.0	179%	12.6	6.2	104%	173.0	138.1	25%
34.	South Interior Karnataka	266.1	141.6	88%	211.6	50.6	318%	23.1	11.9	94%	500.8	204.1	145%
35.	Kerala & Mahe	589.5	303.4	94%	394.5	153.4	157%	42.3	34.8	22%	1026.3	491.6	109%
36.	Lakshadweep	160.1	142.3	12%	165.1	125.3	32%	51.1	54.2	-6%	376.3	321.8	17%

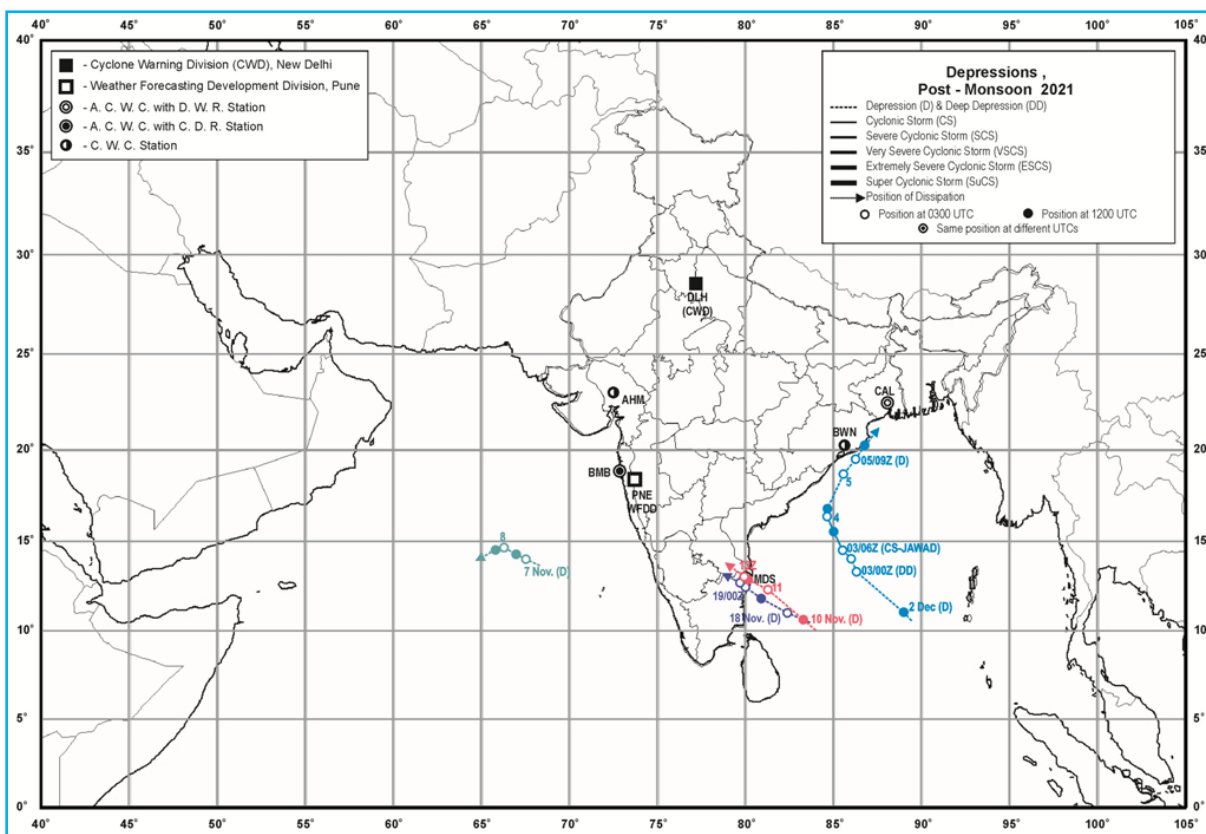


Fig. 2. Cyclones and depressions during post-monsoon season 2021

The post monsoon 2021 season was an unusually wet one; during the season, rainfall over the country and all the homogenous regions too were above normal. The rainfall over the country was 144% of long period average (LPA), while over the homogeneous regions of south Peninsula it was a whopping 160% of LPA, the highest ever since 1901, over northwest India it was 144% of LPA, central India 140% of LPA; east and northeast India it was 113% of LPA. Out of the 36 meteorological sub-divisions 25 sub-divisions or 71% area of the country recorded *excess/large excess* rainfall in the season.

3. Monthly features

3.1. October

3.1.1. Withdrawal of southwest Monsoon

In view of the establishment of an anti-cyclonic circulation in the lower tropospheric levels over western parts of Northwest India and substantial reduction in moisture content and rainfall, the southwest monsoon withdrew from some parts of west Rajasthan and Punjab on 6 October, 2021 against its normal date of 17

September. Further withdrawal was swift and monsoon retreated from major parts of the country by 14 October. After this there was a hiatus of 8 days, on 23 October monsoon withdrew from some more parts of India and it withdrew from the entire country on 25 October.

3.1.2. Commencement of northeast monsoon rains

Simultaneously, with the setting in of northeasterly winds in the lower tropospheric levels, the northeast monsoon rains commenced over extreme south peninsular India on 25 October 2021 against its normal date of 20 October.

3.1.3. Storms and depressions

In October, Severe Cyclonic storm “Shaheen” (30 September - 4 October 2021) formed over northeast Arabian Sea and adjoining Kutch, which formed from the remnant of Cyclonic storm, “GULAB”, which has been discussed in the chapter ‘Weather in India’ Monsoon season (June to September 2021). The southwest monsoon circulation did not weaken in October and the result was a stronger vertical shear along with a weak / disorganised

TABLE 2

Details of the weather systems during October 2021

S. No.	System	Duration	Place of initial Location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Well marked Low Pressure area/Low Pressure area						
1.	Low pressure area	14-16	Eastcentral and adjoining southeast Arabian sea off Lakshadweep area	South	Southeast Arabian sea off Kerala coast	Initially it lay as a cyclonic circulation over central parts of south Bay of Bengal on 1 October. L. P. became less marked on 17. However, a trough of low at mean sea level lay over southeast, adjoining eastcentral Arabian Sea off north Kerala - Karnataka coasts on 17 morning, which became less marked on 18
2.	Low pressure area	14-18	Eastcentral Bay of Bengal and neighbourhood	Northwest	Central parts of Madhya Pradesh	Initially it lay as a cyclonic circulation over north Andaman sea and neighbourhood on 9. The LP became less marked on 19. However, associated cyclonic circulation became less marked on 20
3.	Low pressure area	18-19	West Bengal and adjoining north Odisha	North	Bihar and neighbourhood	Initially it lay as a cyclonic circulation lay over Gangetic West Bengal and neighbourhood which extended up to 5.8 km above m. s. l. on 18 morning. The low pressure became less marked on 20. The associated cyclonic circulation became less marked on 21
(B) Western Disturbances/Eastward moving Systems						
<i>(i) Upper air cyclonic circulation</i>						
1.	At 5.8 km above m.s.l.	13-16	North Pakistan and neighbourhood	Northeast	Punjab and neighbourhood	Initially it lay as a trough with its axis roughly along Long. 70°E to the north of Lat. 32°N on 11. It moved away northeastward
2.	Between 1.5 and 3.1 km above m.s.l.	17-21	Southern parts of Afghanistan and neighbourhood	Do	East Uttar Pradesh and neighbourhood	Initially it lay as a trough in mid-tropospheric westerlies with its axis at 3.1 km above m.s.l. roughly along Long. 62 °E to the north of Lat. 28 °N on 15. The cycir became less marked on 22
3.	At 5.8 km above m.s.l.	26-27	Long. 67 °E to the north of Lat. 32 °N	Do		It moved away on 28
4.	At 3.1 km above m.s.l.	22-25	East Afghanistan and neighbourhood	East northeast	North Pakistan and neighbourhood	Initially it was a trough in mid-tropospheric westerlies with its axis at 5.8 km above m.s.l. on 22. It moved away on 26
<i>(ii) As a trough</i>						
1.	Between 3.1 and 5.8 km above m.s.l.	1-5	Roughly along Long. 62 °E to the north of Lat. 30 °N	East	Roughly along Long. 71 °E to the north of Lat. 32 °N	It moved away east-northeastwards on 6
2.	Upto 3.1 km above m.s.l.	7	From the cycir over eastcentral Arabian sea to westcentral Bay of Bengal, adjoining Andhra Pradesh coast	Stationary	<i>In situ</i>	Became less marked on 8

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TABLE 2 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
3.	Between 3.1 & 5.8 km above m.s.l.	20-22	From the cyclonic circulation over northwest Uttar Pradesh and neighbourhood to eastcentral Arabian sea	Southeast	From Jharkhand to east Vidarbha across Chhattisgarh	Became less marked on 23
4.	Upto 1.5 km above m.s.l.	21-22	From the cyclonic circulation over Comorin area and neighbourhood to eastcentral Arabian sea off Karnataka coast	Stationary	<i>In situ</i>	Became less marked on 23
<i>(iii) As an Induced cyclonic circulation</i>						
1.	Up to 1.5 km above m.s.l.	22-24	Central Pakistan and neighbourhood	East	Central Pakistan, adjoining Punjab and northwest Rajasthan	Became less marked on 25
<i>(C) Other upper air cyclonic circulations</i>						
1.	Up to 1.5 km above m.s.l.	1	Central Pakistan and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 2
2.	Up to 1.5 km above m.s.l.	5-12	Central Pakistan and neighbourhood on 5	Do	Do	Merged with the western disturbance as a cyclonic circulation over north Pakistan and neighbourhood on 13
3.	Up to 3.1 km above m.s.l.	3-5	Southeast Arabian Sea off Kerala coast which extending on 3	Northeast	Eastcentral Arabian sea	Became unimportant on 6
4.	Upto 0.9 km above m.s.l.	7	East Bangladesh and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 8
5.	At 5.8 km above m.s.l.	12	North interior Tamil Nadu and neighbourhood			Merged with the east-west trough running roughly along Lat. 13 °N on 13
6.	Up to 1.5 km above m.s.l.	20-24	South Tamil Nadu coast and neighbourhood	West	Lakshadweep area and neighbourhood	Became less marked on 25
7.	Do	24	Coastal Tamil Nadu and neighbourhood	Stationary	<i>In situ</i>	Do
8.	At 3.1 km above m.s.l.	23	Southeast Bangladesh and neighbourhood	Do	Do	Became less marked on 24
<i>(D) Other troughs/Wind Discontinuity</i>						
1.	Upto 4.5 km above m.s.l.	3	From the low pressure area over central parts of Bihar and neighbourhood to north interior Odisha	Stationary	<i>In situ</i>	Became less marked on 4
2.	Between 1.5 and 3.1 km above m.s.l.	6	From the cyclonic circulation over Tamil Nadu coast to southeast Arabian sea on 6	Do	Do	Became less marked on 7
3.	Upto 3.1 km above m.s.l.	7	From the cyclonic circulation over eastcentral Arabian sea to westcentral Bay of Bengal, adjoining Andhra Pradesh coast	Do	Do	Became less marked on 8

TABLE 2 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
4.	At 5.8 km above m.s.l.	8-10	Roughly along Long. 88 °E to the north of Lat. 22 °N	North	Roughly along Long. 90 °E to the north of Lat. 22 °N at 3.1 km above m.s.l.	Became less marked on 11
5.	At 1.5 km above m.s.l.	10-13	From the cyclonic circulation over north Andaman sea and neighbourhood to cyclonic circulation over eastcentral Arabian sea	West	From the cyclonic circulation over eastcentral Arabian sea off Karnataka coast to the cyclonic circulation over eastcentral Bay of Bengal	Became less marked on 14
6.	Up to 0.9 km above m.s.l.	13	From the cyclonic circulation over eastcentral Arabian Sea off Karnataka coast to Telangana which extended	Stationary	<i>In situ</i>	Became less marked on 14
7.	Upto 1.5 km above m.s.l.	19	Central Uttar Pradesh to the cyclonic circulation associated with the low pressure area over Bihar and neighbourhood	Do	Do	Became less marked on 20
8.	At 0.9 km above m.s.l.	19	South interior Karnataka to south Tamil Nadu coast	Do	Do	Became less marked on 20
9.	Upto 1.5 km above m.s.l.	21-22	From the cyclonic circulation over Comorin area and neighbourhood to eastcentral Arabian sea off Karnataka coast	Do	Do	Became less marked on 23
(E) Trough in easterlies						
1.	Upto 1.5 km above m.s.l.	2-6	From the cyclonic circulation over southwest Bay of Bengal to interior Maharashtra	West	From cyclonic circulation over Tamil Nadu coast to north Konkan	Became less marked on 7
2.	Between 1.5 and 5.8 km above m.s.l.	15-17	From Gulf of Martaban adjoining north Andaman sea to the cyclonic circulation associated with the low pressure area over westcentral and adjoining northwest Bay of Bengal off north Andhra Pradesh - south Odisha coasts	North	From Gulf of Martaban to the cyclonic circulation associated with the low pressure area over north Telangana and neighbourhood	Became less marked on 18
3.	Up to 1.5 km above m.s.l.	26-29	From cyclonic circulation over southeast Bay of Bengal and neighbourhood to north Bay of Bengal	West	From the cyclonic circulation associated with the low pressure area over southwest Bay of Bengal, adjoining Sri Lanka off Tamil Nadu coast to north coastal Andhra Pradesh	Became less marked on 30
4.	At 0.9 km above m.s.l.	26-28	From southeast Arabian sea off Kerala coast to eastcentral Arabian sea off Karnataka coast	Stationary	<i>In situ</i>	It lay as a cyclonic circulation over southeast Arabian sea on 28 and became less marked on 29

TABLE 3

Details of the weather systems during November 2021

S. No.	System	Duration	Place of initial Location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Cyclonic storm						
1.	Depression	7 (0300 UTC) - 9 morning	Eastcentral Arabian Sea	West	Central parts of Arabian sea	Initially it lay as a cyclonic circulation over southeast Bay of Bengal and neighbourhood on 26 October morning. Under its influence, a low-pressure area formed over central parts of south Bay of Bengal on 27. It weakened into a well marked low pressure area over central parts of Arabian sea on 9 November morning. Details are given in the article on Storms & Depressions over the north Indian Ocean-2021
2.	Depression	10-11 (0000 UTC)	Central parts of south Bay of Bengal	Northwest	North coastal Tamil Nadu near Lat. 13.0 °N / Long. 80.2 °E	Initially it lay as a cyclonic circulation over southeast Bay of Bengal and adjoining equatorial Indian Ocean off Sumatra coast on 6. Merged with the cyclonic circulation over eastcentral Arabian Sea and adjoining southeast Arabian sea off Karnataka - north Kerala coasts on 15. Details are given in the article on Storms & Depressions over the north Indian Ocean-2021
3.	Depression	18-19	Southwest Bay of Bengal off north Tamil Nadu coast	West	North Tamil Nadu, near Lat. 12.7 °N / Long. 79.7 °E	Initially it lay as a cyclonic circulation over Gulf of Thailand and neighbourhood. It became less marked on 20. Details are given in the article on Storms & Depressions over the north Indian Ocean-2021
(B) Well marked Low Pressure area/Low Pressure area						
1.	Well marked Low Pressure	16-23	Eastcentral Arabian sea off Karnataka coast	Southwest	Southwest and adjoining westcentral Arabian sea	It formed from the remnant cyclonic circulation of the depression. It intensified into well marked low pressure area on 19. It weakened into a low-pressure area on 23 and became less marked the same day
(C) Western Disturbances /Eastward moving Systems						
(i) As a trough						
1.	At 5.8 km above m.s.l.	1-3	Roughly along Long. 69 °E to the north of Lat. 30 °N	East-northeast	Roughly along Long. 78 °E to the north of Lat. 32 °N	Moved away east-northeastwards on 4
2.	Do	5	Roughly along Long. 68 °E to the north of Lat. 33 °N	Do		Moved away east-northeastwards on 6
3.	Do	17-18	Roughly along Long. 55 °E to the north of Lat. 30 °N	Do	Roughly along Long. 62 °E to the north of Lat. 30 °N	Moved away east-northeastwards on 19
4.	Do	29 Nov - 1 Dec	Roughly along Long. 58 °E to the north of Lat. 20 °N	Do	Roughly along Long. 63 °E to the north of Lat. 15 °N	It lay as a cyclonic circulation over north Pakistan and neighbourhood at 3.1 km above m.s.l. on 2 December. Became less marked on 4 December

TABLE 3 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(D) Other upper air cyclonic circulations						
1.	At 1.5 km above m.s.l.	1-4	North Pakistan and neighbourhood	Stationary	Haryana and neighbourhood	Became less marked on 5
2.	Up to 3.1 km above m.s.l.	5-7	Southwest and adjoining westcentral Bay of Bengal off North Tamil Nadu-south Andhra Pradesh coasts	West	Westcentral and adjoining southwest Bay of Bengal off south Andhra Pradesh-north Tamil Nadu coast	Became less marked on 8
3.	Do	24-25	North Pakistan and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 26
4.	Upto 3.1 km a.s.l.	21 Nov - 7 Dec	South Andaman Sea and neighbourhood	West	Eastcentral Arabian sea off Maharashtra coast	Became less marked on 8 December
5.	Between 3.1 and 4.5 km above m.s.l.	27	Northwest Uttar Pradesh and neighbourhood which extended	Stationary	<i>In situ</i>	Became less marked on 28
(E) Trough in easterlies						
1.	Up to 0.9 km above m.s.l.	2-7	From Lakshadweep area to eastcentral Arabian Sea off Karnataka coast	West	From the cyclonic circulation associated with the Depression over eastcentral Arabian sea to northeast Arabian sea off south Gujarat coast	Became less marked on 8
(F) Other Troughs						
1.	At mean sea level	1-3	From the low-pressure area over Comorin area and adjoining north Sri Lanka coast to westcentral Bay of Bengal off south Andhra Pradesh coast	Oscillatory	From the low-pressure area over Comorin area and neighbourhood to westcentral Bay of Bengal off south Andhra Pradesh coast	Became less marked on 4
2.	Up to 5.8 km above m.s.l.	8-9	From the cyclonic circulation over southeast Bay of Bengal and adjoining south Andaman sea to southwest Bay of Bengal off Tamil Nadu coast	Do	From the well-marked low pressure area over southeast and adjoining southwest Bay of Bengal to Gulf of Mannar	Became less marked on 10
3.	Do	14-17	From the cyclonic circulation over southeast Arabian sea to southwest Bay of Bengal	Do	From the cyclonic circulation associated with the low-pressure area over southeast and adjoining south west Bay of Bengal to south Tamil Nadu	Became less marked on 18
4.	Up to 0.9 km above m.s.l.	12-13	From the cyclonic circulation associated with a low-pressure area over north interior Tamil Nadu and neighbourhood to north coastal Odisha	Do	From the cyclonic circulation over north interior Tamil Nadu and neighbourhood to Gangetic West Bengal across Andhra Pradesh and Odisha	Became less marked on 14

TABLE 3 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	At 0.9 km above m.s.l.	15-22	From the eastcentral and adjoining southeast Arabian sea off Karnataka-north Kerala coasts to north Konkan	West	From the cyclonic circulation associated with the well marked low pressure area over westcentral and adjoining southwest Arabian sea to north Maharashtra coast	Became less marked on 23
6.	Up to 3.1 km above m.s.l.	22-34	From the cyclonic circulation over southeast Bay of Bengal and neighbourhood to Tamil Nadu coast	East	From the cyclonic circulation over southwest and adjoining southeast Bay of Bengal to south Tamil Nadu	Became less marked on 25
7.	At 0.9 km above m.s.l.	19	From the cyclonic circulation associated with the Depression over north Tamil Nadu to interior Odisha	Stationary	<i>In situ</i>	Became less marked on 20
8.	Up to 1.5 km above m.s.l.	29 Nov - 3 Dec	From southeast Arabian sea to eastcentral Arabian sea off Karnataka coast	Oscillatory	From southeast Arabian sea to northeast Arabian sea off south Gujarat-north Konkan coast	Became less marked on 4 December

Madden Julian Oscillation (MJO) index; they together inhibited the intensification of the lows, therefore though low-pressure areas were formed, they did not strengthen into cyclones.

3.1.4. Other synoptic features and associated weather

Table 2 provides a summary of the synoptic features for the month of October 2021. The sub-divisional percentage departures of rainfall from normal and significant amounts of rainfall are given in Tables 1 and 5, respectively.

In October anomalous easterlies were observed in the midtropospheric levels over the southern Peninsular India and adjoining Bay of Bengal. These easterlies/north easterlies over the Bay of Bengal brought moisture into peninsular India, enhancing rainfall activity in the region.

A cyclonic circulation in the lower tropospheric levels which lay over central parts of south Bay of Bengal on 1 October, subsequently progressed westwards and emerged into Arabian Sea and lay over eastcentral Arabian Sea off Karnataka coast on 7, extending up to mid tropospheric levels along with southwestward tilt with height. Under the influence of this cyclonic circulation, a

low pressure area formed over eastcentral and adjoining southeast Arabian Sea off Lakshadweep area on 14 morning, which became less marked on 18. The system in its formation and advancement across the peninsular India caused rainfall / thunderstorm over Tamil Nadu, Puducherry, Karaikal, Kerala, Mahe, south Interior Karnataka and coastal areas of Maharashtra. This low-pressure area along with an east-west trough in mid tropospheric levels aligned across south peninsula caused fairly widespread to widespread rainfall / thunderstorm over Kerala, Lakshadweep and scattered to fairly widespread rainfall / thunderstorm over other parts of extreme south peninsula, isolated heavy / very heavy rainfall also occurred over these areas on two to three days and isolated extremely heavy rainfall occurred over Kerala - Mahe on one day. A cyclonic circulation lay over Comorin area and neighbourhood in the lower tropospheric levels, which subsequently moved over to Lakshadweep area and neighbourhood in the third week and persisted over that area for two days before getting less marked. In addition to that, a trough ran from the cyclonic circulation over Comorin area and neighbourhood to eastcentral Arabian sea, off Karnataka coast in the lower tropospheric level. The influence of all these systems culminated in the monthly rainfall for October 2021 over Kerala to be the highest (94% departure from LPA) since 1901. Another low pressure

TABLE 4

Details of the weather systems during December 2021

S. No.	System	Duration	Place of initial Location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Cyclonic Storm						
1.	Cyclonic storm, "JAWAD"	2-5 (UTC)	Southeast Bay of Bengal near Lat. 11.0°N / Long. 89.0°E	Northwest	Northwest Bay of Bengal close to Odisha coast near Lat. 19.5°N / Long. 86.2°E	Initially it was a low pressure area over south Thailand and neighbourhood. Details are given in the article on Storms & Depressions over the north Indian Ocean-2021
(B) Low Pressure area						
1.	Well Marked Low Pressure area	17-20	Southeast Bay of Bengal and adjoining equatorial Indian ocean	Southeast	Northern parts of Malacca strait and neighbourhood	Initially it lay as a cyclonic circulation over equatorial Indian ocean to the south of Sri Lanka. Became unimportant for the Indian region on 21 evening
(C) Western Disturbances /Eastward moving Systems						
<i>(i) Upper air cyclonic circulation</i>						
1.	At 3.1 km above m.s.l.	8-9	North Pakistan and adjoining Punjab	East	Northeast Rajasthan and neighbourhood	Initially it lay as a trough roughly along Long. 57°E to the north of Lat. 27°N
2.	Upto 3.1 km above m.s.l.	5-7	North Pakistan	Northeast	West Uttar Pradesh and neighbourhood	The trough aloft in mid and upper tropospheric westerlies with its axis at 5.8 km above m.s.l. The trough moved away east-northeastward on 7 afternoon. However, the western disturbance as a cyclonic circulation over west Uttar Pradesh and neighbourhood became less marked on 8 morning
3.	Between 3.1 and 5.8 km above m.s.l.	15-23	Afghanistan and neighbourhood	East	Southeast Bangladesh and neighbourhood	Became less marked on 24
4.	Between 3.1 and 4.5 km above m.s.l.	14-15	North Pakistan and neighbourhood	Northeast	Jammu and neighbourhood merged with the western disturbance as a cyclonic circulation over north Pakistan and neighbourhood	Initially it lay as a trough in mid-tropospheric westerlies with its axis at 5.8 km above m.s.l. ran roughly along Long. 62°E to the north of Lat. 32°N on 12. With a trough aloft in mid-tropospheric westerlies with its axis at 5.8 km above m.s.l. which became less marked on 25. Western disturbance as a cyclonic circulation moved away northeastwards on 15. Jammu and neighbourhood merged with the western disturbance as a cyclonic circulation over north Pakistan and neighbourhood on 16
5.	Up to 3.1 km above m.s.l.	21-23	North Pakistan and neighbourhood	Do	Jammu-Kashmir and Ladakh	Moved away east-northeastward on 24 Morning
6.	At 3.1 km above m.s.l.	28-30	North Pakistan and neighbourhood	East	Bihar	Initially it lay as a trough in mid & upper tropospheric westerlies with its axis at 5.8 km above m.s.l. ran roughly along Long. 68°E to the north of Lat. 30°N on 27. Moved away northeastwards on 31
7.	Do	26-27	east Afghanistan and adjoining Pakistan	Northeast	North Haryana and neighbourhood	Initially it lay as a trough roughly along Long. 57°E to the north of Lat. 27°N at 3.1 km above m.s.l. on 23. The cyclonic circulation moved away east-northeastwards on 28

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TABLE 4 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(ii) As a Trough/Trough in westerlies						
1.	At 5.8 km a.s.l	11	Roughly along Long. 87°E to the north of Lat. 27°N on 11	Northeast	-	Moved away northeastwards on 12
2.	Between 1.5 and 3.1 km above m.s.l.	24	Roughly along Long. 88°E to the north of Lat. 24°N	East	-	Moved away eastwards on 25
(iii) As an induced cyclonic circulation						
1.	Upto 1.5 km a.s.l.	28	Southwest Rajasthan and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 2 January evening
2.	Do	26	Southwest Rajasthan and neighbourhood	Do	Do	Became less marked on 27
3.	Do	23-24	Northwest Rajasthan and neighbourhood	Do	Northeast Rajasthan and neighbourhood	Became less marked on 25
(D) Other upper air cyclonic circulations						
1.	Up to 0.9 km above m.s.l.	4-6	Gulf of Mannar and neighbourhood	East	Comorin area	Became less marked on 7
2.	Up to 1.5 km above m.s.l.	13-15	West Rajasthan and neighbourhood	North	North Haryana and neighbourhood	Became less marked on 16
3.	Up to 2.1 km above m.s.l.	12	Northwest Uttar Pradesh and neighbourhood	Stationary	<i>In situ</i>	Became less marked on 13
4.	At 1.5 km above m.s.l.	8	Central parts of Uttar Pradesh	Do	Do	Became less marked on 8 evening
5.	Do	28-29	Central parts of Uttar Pradesh	Southwest	East Uttar Pradesh and adjoining Bihar	Merged with the western disturbance as a cyclonic circulation over east Uttar Pradesh and adjoining Bihar on 30
6.	Do	25-27	Southeast Uttar Pradesh and neighbourhood	Do	Southwest Bihar and neighbourhood	Became less marked on 28
7.	At 3.1 km above m.s.l.	25	West Assam and neighbourhood	-	-	It lay as a trough at 3.1 km above m.s.l. roughly along Long. 92 °E to the north of Lat. 20 °N on 26, which moved away east northeastwards on 27
8.	At 5.8 km a.s.l	31 Dec 2021 morning to 3 Jan 2022	Southwest Bay of Bengal off Sri Lanka coast	Stationary	<i>In situ</i>	Became less marked on 3 January 2022
(E) Trough in Easterlies						
1.	Upto 0.9 km a.s.l.	8-9	From southwest Bay of Bengal off north Sri Lanka coast to central parts of north Bay of Bengal	West	From Sri Lanka to westcentral Bay of Bengal off Andhra Pradesh coast	Became less marked on 10
(F) Other Troughs						
1.	At 3.1 km a.s.l.	3	From northeast Arabian Sea off Gujarat coast to Haryana	Stationary	<i>In situ</i>	Became less marked on 4

TABLE 4 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.	Upto 1.5 km a.s.l.	28 evening	From southwest Madhya Pradesh to south Bihar	East	East Uttar Pradesh and adjoining Bihar to Telangana	Became less marked on 30
3.	At 0.9 km above m.s.l.	26-27	From the cyclonic circulation over southwest Rajasthan and neighbourhood to Vidarbha	Oscillatory	From the cyclonic circulation over southwest Rajasthan and neighbourhood to north Telangana	Became less marked on 28

formed from a cyclonic circulation over north Andaman sea and neighbourhood on 14 October and moved to central parts of Madhya Pradesh. A third low pressure area originated over West Bengal and adjoining north Odisha leading to convergence of moist southerlies / south easterlies over the region and caused fairly widespread to widespread rainfall / thunderstorm over parts of northeast and east India.

Trough in easterlies, movement of western disturbances and cyclonic circulations in the lower tropospheric levels caused isolated to scattered rainfall / thunderstorm over western Himalayan Region and adjoining plains of Northwest India. All the 9 subdivisions from the homogenous region, northwest India recorded *large excess* rainfall in the month of October.

Some of Stations received record of 24-hour rainfall. A list of stations is given below with their previous record and date:

Station	24 hr. record rainfall in October 2021 (mm)*	Date	Previous rainfall record (mm)	DD-MM-YYYY
Forbesganj	257.4	20	176.8	18-10-1985
Palam	56.1	18	52	03-10-2004
Car Nicobar	103	8	98.4	15-10-2017
Pahalgam	67.8	24	67.2	28-10-1982
Jammu Aero	122	24	63.8	20-10-2006
Udhampur (Iaf)	139.6	24	64.2	13-10-2013
Mangaluru Ap Obsy	192.3	13	161.6	09-10-1993
Karipur Ap.	254.9	12	167.6	25-10-2008
Washim	54.2	17	29.3	03-10-2008
Kannod-Arg	52	18	39.4	08-10-1975
Gangtok	129.7	20	129.5	12-10-2001
Sukinda	41	18	33.2	10-10-1974

Bhatinda	78	5	31.2	04-10-1978
Jalandhar	32.6	24	0.2	02-10-1978
Bhilwara	53	18	47.6	01-10-1970
Bundi	48	18	39	14-10-2014
Sriganganagar Tehsil Sr	42	24	33	04-10-1996
Erode	96	1	75	29-10-2006
Mahabalipuram	60.4	6	23.2	24-10-1978
Arakonam	94.4	6	36	12-10-1998
Azamgarh	200	2	81	11-10-1958
Bareilly Pbo	178	19	92.6	02-10-1998
Bulandshahar	105	18	62.8	18-10-1971
Gorakhpur	192.9	2	160	11-10-1956
Kanpur Obsy	127.6	19	109.2	07-10-1927
Rampur	98.3	19	47.5	15-10-2014
Chandigarh	29.7	25	18.6	11-10-2018
Chamoli	101.2	19	61	16-10-1985
Joshimath	185.6	19	108	18-10-1998
Roorkee	40	17	21	11-10-2013
Mukteshwar	340.8	19	182.4	02-10-1910
Nainital	401	19	300.7	09-10-1956
Pauri	112	19	26	01-10-2019
Dharchula	196	19	84	06-10-2009

Source : IMD Diagnostics Bulletin of India Oct 2021

3.1.5. Temperature

The maximum temperatures were *below normal* over northwest India, *above normal* over east and northeast India and normal over the rest of the country.

The minimum temperatures were generally *above normal* in the month over north India, *viz.*, over parts of

Jammu-Kashmir and Ladakh, Punjab, Haryana, Chandigarh, Delhi, Uttar Pradesh, Sikkim, east Madhya Pradesh, South Rajasthan, Nagaland, Manipur, Mizoram and Tripura.

Some stations broke their previous records of maximum temperatures for this month. A list of stations is given below:

Station name	Previous record (°C)	MM/DD/YY	New record (°C)	Date (Oct. 2021)
Cherrapunji*	30	10/17/2016	30.8	14
Guwahati AP	37	10/01/2009	37.7	14
Passighat	36.2	10/01/1983	36.2@	18
Shillong*	37.8	10/01/2009	28.3	15
Cooch Behar AP	35.5	10/06/2007	36.9	14
Motihari	36.9	10/12/1976	38	16
Dehra Dun	34	10/01/2015	34.7	16
Mukteshwar**	25.5	10/07/1974	26.4	16
Ferozepur	37.4	10/01/1980	39.8	09
Shimla	25.6	10/03/2009	26.8	15
Kanyakumari	35.2	10/13/1983	35.2@	03
Medikeri*	30.3	10/26/1997	31	22

*Based on real – time available data @ mean extreme occurred more than once

Source : IMD Diagnostics Bulletin of India Oct 2021

No *heat wave/cold wave* conditions occurred during October. The month's and the season's highest maximum temperature was 39.4 °C at Jalgaon (Madhya Maharashtra) on 14 October and the lowest minimum temperature of the month was 8.2 °C Pachmari (west Madhya Pradesh) on 31 October in the plains of the country.

3.1.6. Damages associated with disastrous weather events

As per media reports, heavy rains in West Bengal led to floods which affected above 22 lakh people in several areas and killed 2 persons in rain related incidents. Heavy rains in several districts of Saurashtra took a toll of 6 persons in different rain related incidents. Heavy downpour caused havoc in Trissur district, as a result low lying areas were inundated; many trees were uprooted which led to disruption of power supply in many areas, many houses were flooded as temporary bund breached, house wall collapsed in two different incidents, more than 300 poultry birds died as poultry farm was flooded. Kham and Sukhana rivers in Aurangabad, Marathwada were

flooded due to heavy rain that led to damage to 5 bridges and rainwater entering in more than 300 houses. Heavy rains lashed most parts of Bengaluru city flooding 100 of homes and uprooting trees; four persons died and 6 cattle washed away in different parts of Karnataka. Heavy rain caused damage to crops, viz., onion, soybean, maize, grapes, tomato, groundnut etc. in Ahmednagar and Nasik districts of Maharashtra. Heavy rain pounded large parts of Thiruvananthapuram, flood water inundated low-lying areas, damaged houses and disrupted road traffic in several districts taking the life of three individuals. Incessant rains wreaked extensive damage in some districts of Tamil Nadu, many houses were damaged, crops worth lakhs of rupees were destroyed and three persons died in different rain related incidents. Disastrous flash floods caused by heavy rain and series of landslides in hilly areas of five central Kerala districts took toll of more than 53. Extremely heavy rain caused landslides in many places in Uttarakhand in which 75 persons were killed.

According to media reports, lightning strikes killed seven persons and one bull in Maharashtra, one person and one child were injured in Karnataka, a fisherman died in Thoothukudi, Tamil Nadu. The Gopuram (temple tower) of Sri Vedanarayana Swamy Temple at Tirupati, was slightly damaged in a lightning strike.

3.2. November

3.2.1. Storms and depressions

In the month of November, a total of three depressions and one well marked low pressure area formed over the north Indian ocean. The first intense system was a Depression over eastcentral Arabian Sea during 7 - 9 November. It gradually weakened and lay as a Low Pressure Area over central parts of south Arabian Sea on 12 November morning and then became less marked but the associated cyclonic circulation persisted and moved to eastcentral Arabian Sea and adjoining southeast Arabian Sea off Karnataka - north Kerala coasts and then intensified into a Low Pressure Area. It then further strengthened into a Well Marked Low Pressure Area on 19 November. It weakened into a Low Pressure Area on 23 and became less marked on the same day. This system and its associated cyclonic circulation extending up to mid tropospheric levels and a trough in the lower tropospheric levels from the system towards Bay of Bengal across South Peninsula significantly contributed towards the rainfall over the region. Another depression formed under the influence of the cyclonic circulation over southeast Bay of Bengal and neighbourhood. It crossed north Tamil Nadu and adjoining south Andhra Pradesh coasts close to Chennai. This system caused heavy to very heavy rainfall

at a few places with extremely heavy rainfall at isolated places and heavy to very rainfall at a few places over Tamil Nadu, Puducherry and Karaikal. It also caused heavy rainfall at a few places over Rayalaseema. The next system of this month was a Depression over Bay of Bengal (18 - 19 November, 2021), which formed as a Low Pressure over south Andaman sea and adjoining Thailand coast on 13 November. Under favourable environmental conditions, it concentrated into a Depression over southwest Bay of Bengal off North Tamil Nadu coast in the forenoon of 18 November. It moved west-northwestwards and crossed north Tamil Nadu coast between Puducherry and Chennai which gradually became less marked on 20 November. It generated heavy to very heavy rainfall at few places with *extremely heavy* rainfall at *isolated* places over Tamil Nadu, Puducherry, Karaikal and Rayalaseema.

3.2.2. Weather and associated synoptic features

A summary of the synoptic systems for the month of November 2021 are given in Table 3. The subdivisionwise percentage departure of rainfall from normal and the significant amounts of rainfall during the month are given in Tables 1 and 5, respectively.

Movement of western disturbances and their induced systems caused isolated to scattered rainfall / thunderstorm over Western Himalayan Region and isolated rainfall over adjoining areas of northwest India during the first and fourth week of the month. The remnants of western disturbances caused isolated rainfall / thunderstorm over parts of northeast and adjoining areas of east India during the week. A cyclonic circulation lay over south Andaman sea and neighbourhood in the lower tropospheric levels on 21 November it progressed westwards and reached over southeast Arabian Sea and adjoining Lakshadweep area on 30 November, this system caused fairly widespread to widespread rainfall / thunderstorm over parts of south Peninsula and Lakshadweep islands.

Some of Stations received record of 24-hour rainfall. A list of stations is given below with their previous record and date:

Station	24 hr. record rainfall in November 2021(mm)*	Date	Previous rainfall record (mm)	DD-MM-YYYY
Asansol	78	14	0.7	1-11-1960
Ranchi Aero	55.8	14	49.4	13-11-1979
Tbia (Thane Dist.) Imd Part Time	50	22	6.8	2-11-2007
Panjim-Imd Obsy	121.3	21	109	06-11-1922

Durg	70.2	22	59.6	26-11-1972
Anantpur	101.1	19	99.3	05-11-1948
Cuddapah	112.8	19	104.6	22-11-1943
Mahabalipuram	181.1	27	71.2	02-11-1979
Bengaluru Kial Obsy	90.6	19	57	03-11-2015
Chamaarajanagar	67.2	5	65.2	10-11-2015
Mangaluru	161.2	20	112.1	23-11-1958
Kolar Pwd	149.4	19	112.6	01-11-1975
Chikkanahalli Aws	97	19	86.6	01-11-2013
Tumakuru	148.8	19	73	24-11-1997
Kochi Cial	189.8	14	145.8	05-11-2015

*Based on real – time available data

Source :IMD Diagnostics Bulletin of India Nov 2021

3.2.3. Temperature

Cold day and *cold wave* conditions were not observed in this month.

The minimum temperatures in this month over north India were generally *normal*, while, they were above *normal to appreciably above normal* over central India and adjacent Peninsula. The night temperatures were *appreciably above normal* over sub-divisions of Chhattisgarh and Vidarbha.

The month's lowest minimum temperature was 5.2 °C reported at Sikar (east Rajasthan) on 17 November over the plains of the country.

3.2.4. Damages associated with Disastrous weather events

As per media reports lightning strike took toll of four persons, two in Tamil Nadu and two in Karnataka. Heavy rain led to floods in Kerala, Tamil Nadu, Andhra Pradesh and Maharashtra in this month. One person died and two were injured in rain related incidents in Tamil Nadu. Rain affected over 500 small and medium enterprises across Tamil Nadu; nearly 350 units suffered plant and equipment damage in the industrial estate. Heavy rains wreaked havoc in Tirupati; many areas were inundated; cars and cattle's were washed away in the swirling water at various junctions; four women died in rain related incidents. Widespread rain flooded several low-lying areas and triggered landslips in the rural belt in Kozhikode district of Kerala, crops, viz., rice, cotton, banana and rubber plants on thousands of acres were damaged. 4 persons died in different rain related incidents in Maharashtra; due to incessant rain 9 people died each in Andhra Pradesh, Tamil Nadu and another 13 in Rayalaseema; over 2000 hectares of rice fields were

TABLE 5

Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
1 Oct	Manameldudi 19, Aryari 18, Purulia 17, Bagodari and Sheikhpura 15 each, Barbigha, Krishnarajpet and Kauwakol 14 each, Bargur and Burnpur 13 each, Markachou, Jhajha, Sivaganga, Cherwa, Chandan, Gomia, Pulipatti and Chandankiary 12 each, Ponnamaravathi, Seoni, Kalyanpur, Vathalai Anaicut and Natham 11 each, Madhupur, Kamatchipuram, Bhavani, Pachrukhi, Kodumudi, Erode, Nandadih and Sikatia 10 each, Barhiya, Sono, Barkisuraya, Alangudi, Perambalur, Pudukottai, Koner, Najibabad (t), Jamtara Fmo, Satgaon, Jamui, Putki, Ballia, Siswan, Tiruchengode, Sama and Mahua 9 each, Deoghar, Narhat, Thogamalai, Arimalam, Lakhisarai, Vaishali, Simula, Avudayarkoil, Perungalur, Mimisal, Dindigul, Gaighat (Bla Fmo), Maharajganj and Jalalpur 8 each, Kangra AP, Multai, Darauli, Rasipuram, Marsrakh, Sitamau, Kumarapalayam, Dehri, Chapra, Makrana SR, Khambhalia, Sholavandan, Madurai South, Chittampatti, Gannavaram AP, Vijayawada AP, Manapparai, Aravakurichi, Vedasandur, Loharkhet, Chothkabarwara SR, Tundi, Bhore, Tekari, Bargaon, Palganj, Saraiya, Nawada, Hisua, Dinara and Ghosi 7 each, Chandil, Ramgarh Bdo, Ramgarh, Perundurai, K.paramathi, Viraganur Dam, Tarari, Jamnagarvkaws, Lakhpat, Chotila, Musiri, Ulhasnagar, Tirupathur, Mysuru PTO, Karaikudi, Tonk Vanasthali, Daudnagar, Paramakudi, Kaniha, R.s.mangalam, Katoria, Bodh Gaya, Parsa, Badarwas, Pachmarhi, Goraul/Doli, Garhi, Marhaura/Amnaur, Mettupatti, Devala, Barh and Halsi 6 each, Tallakulam, Devakottai, Tiruvadana, Tirupuvanam, Peravurani, Ennore AWS, Vadipatti, Madurai Airport, Pudukhatram, Usilampatti, Dwarka, Melur, Sinner, Palmanganj, Deo, Uniara/Aligarh, Mandana SR, Sargur, Krishnarajasagara, Sanguem, Barauli, Malvan, Devgad, Chintalapudi, Tiruvuru, Kaikalur, Thangadh, Mandvi (k), Barauni, Gaya AP, Kharsama, Raipur, Mohanpur, Tenughat, Phusro, Koksara, Ichhawar, Nasrullahganj, Hussainganj, Gopalganj, Indrapuri, Harnaut, Rewaghat, Suryagadha, Kataiya, Jahanabad, Hathwa and Jandhaha 5 each,
2 Oct	Azamgarh and Ghazipur CWC 20 each, Gorakhpur 19, Nidige, Chanpatia, Mahua and Narhat 15 each, Chatia 14, Birdghat, Padrauna and Hathwa 13 each, Kelvarkop, Gopalganj and Buxar 12 each, Minapur, Itarahi, Mushari, Muzaffarpur, Hisua, Chandauli and Mahedi/Mehshi 11 each, Khandwa, Kudulu, Dangs (ahwa) and Paithan 10 each, Gautampura, Sahebganj, Kataiya, Udaipur-wati, Bilara, Belpada, Barauli, Mohammedabad (Y), Harapanahalli, Sonpeth, Davanagere, Hata, Amraoti, Shevgaon and Pusa 9 each, Gadag PBO, Bhore, Deoria, Gadag AWS, Parbhani , Simri, Markachou, Ballia, Uthangarai, Vilupuram and Manvi 8 each, Mangrulpir, Kottayam, Kozhikode, Mahe, Patnagarh, Satgaon, Mandapam, Rameswaram, Khultabad, Kessariah, Jewargi, Saraiya, Salempur and Channagiri 7 each, Turtipar, Indapur, Jandhaha, Bagaha, Umarkote, Jujumura, Seethathode AWS, Suintikoppa, Rewaghat, Davanagere PTO, Konni, Gangapur, Gaighat (Bla Fmo), Tellichery, Pakhanjur, Railmagra SR, Purulia, Motihari, Gyalsing PTO, Barhampur, Hadagali, Rajpur, Musiri, Bhainsdehi, Mohanur, Krishnarayapuram and Goraul/Doli 6 each, Manantoddy, Vadakara, Peringalkuthu AWS, Haveri Apmc, Konni ARG, Karanjalah, Batli, Thirukoilur ARG, Shahpur, Hazaribagh, Mylam AWS, Ajjampura, Kammardi, Mayanur, Vepur, Katikere, Chakradharpur, Bhadgaon, Kheronighat, Mathili, Deogarh, Virajpet, Mohanpur, Boinpalle, Keerampara ARG, Batkuli, Aurangabad Ap-imd, Kannad, Purna, Nichlaul, Patahi, Varanasi/Bab AP, Chakia, Raddewadgi ARG, Ahirwalia, Daryapur, Shirur Kasar, Sengaon, Chand, Risod, Paratwada, Malshiras, Phoolpur Teh, Pachora, Vaishali, Depalpur, Khaknar, Malegaon, Nagari, Ramnagar, Gaganbawada, Siswan, Ekangersarai, Piprahi, Hirekerur, Dinara, Rajauli, Barshi, Nawada, Madha and Pamban 5 each
3 Oct	Thakurganj 21, Darauli 17, Taibpur 14, Saulighat and Belsand 13 each, Ballia, Pusa, Nirmali, Falakata and Kozhikode 12 each, Gossaigaon and Mathabhanga 11 each, Jaley, Hathwa, Jaipur Tehsil SR, Benibad, Minapur, Barobhisha, Bahadurganj, Vellarikkundu AWS, Cooch Behar and Kanyakumari 10 each, Dhubri CWC, Bindki, Pasighat AP, Siswan, Padinjarathara Dam AWS, Cheruthazham ARG, Baltara, Mattannur ARG, Taliparamba, Konni, Muvattupuzha ARG, Piprahi, Manapparai, Turtipar, Domohani, Jalpaiguri and Kothagiri 9 each, Fatehpur Tehsil, Mahedi/Mehshi, Karipur Ap., Konni ARG, Motihari, Dhubri IMD, Sheohar, Alipurduar (CWC), Alipurduar PTO, Sahebganj and Pattembi 8 each, Sonbarsa, Dumri, Manameldudi, D/Mohanbari AP, Bargarh, Matijuri, Dhengraghat, Mahua, Saraiya, Rewaghat, Muzaffarpur, Mushari, Avinasi, Vellanikkara, Chalakudi, Chargharia, Birdghat, Kakkayam AWS, Thogamalai, Hosdurg, Mannarkkad, Kishanganj, Chakia, Madhipura and Nagercoil 7 each, Kochi C.i.a.l., Ponnampet PWD, Mul, Goraul/Doli, Kadavur, Radhapuram, Panniyoor ARG, Virajpet, Sargur, Kessariah, Rasra, Barauli, Tariyani, Vepur, Sangod, Kamtaul, Mettupalayam, Begu SR, Azamgarh, Amfu Pundibari and Maduranthagam 6 each, Musiri, Kurudamannil, Supaul, Annur, Thuraiyur, Tuting, Vedasandur, Cheyyur, Tikrikilla, Karimganj, Manantoddy, Annavasal, Coonoor PTO, Sathyamangalam, Gharmura, Viralimalai, Thiruthuraiipoondi, Umerpada, Ottapalam, Champasari, Hayaghat, Buxar, Sikti, Raniganj, Lalganj Aara, Mohammedabad (Y), Gyalsing PTO, Chepan, Bagdogra IAF, Patahi, Suintikoppa, Hudakere, Madikeri PTO, Kushalnagar, Bandipura, Mani, Karmala, Parola, Ahirwalia, Katihar North, Mahe, Dhengbridge, Kanjirappally, Always PWD, Kannur, Ratlam Kumbhraj, Tribeniganj, Birpur, Hussainganj, Baigania, Khagadia, Amalner, Parsa, Samastipur, Maheshi, Phulparas, Jhanjharpur, Udai Kishanganj, Singheshwar, Galgalia and Coonoor 5 each
4 Oct	Veerapandi 12, Jamshedpur Mo and Jnanabharathi Bu Campus 11 each, Sangli, Umerpada, Tikrikilla and Mohammedabad (Y) 10 each, Amfu Pundibari and Pipalkhunt SR 9 each, Panposh, Dhubri IMD, Dhubri CWC, Cherrapunji, Rajgangpur, Mandira Dam, Cherrapunji (rkm), Tura AWS, Depalpur and Tura 8 each, Lathikata, Hasanganj, Mathili, Ankleshwer, Mawsynram, Cooch Behar, Khliehriat, Kodaikanal and Vaibhavwadi 7 each, Williamnagar AWS, Jowai, Balimundali, Karanjia, Chand, Itarsi, Godadongri, Benibad, Osmanabad, Alipurduar (CWC), C N Halli, Nawabganj Tehsil, Hardoi, Bengaluru HAL AP, Bengaluru City, Kagal, Neemsar, Itarahi and Alipurduar PTO 6 each, Hirekerur, Kiphire Nsdma AWS, Parvathipuram, Channagiri, Tyagarthi, Komarada, Tiptur, Mathabhanga, Dehri, Williamnagar, Tribeni/Balmikinagar, Kharagpur (L.i.t), Fatehpur Tehsil, Ramnagar, Lahunipara, Hardoi Teh, Joda, Erimayur ARG, Rae Bareli CWC, Bhatpurwaghat, Aurangabad, Timarni and Kalyani Smo 5 each
5 Oct	Manash Nh Xing 17, Goalpara CWC 16, Aie Nh Xing 13, Panbari 12, Kokrajhar 11, Pilibanga SR 10, Kumargram, Cherrapunji, Khandala Bavda, Barpeta, Kalaktang and Poonjar AWS 9 each, Sathyamangalam, Dhubri IMD, Dhubri CWC, Bhatinda, Sri Niketan and Thenmala ARG 8 each, Beky Rly. bridge, Jaisinagar, Bathinda AWS, Mawsynram, Konni, Seethathode AWS, Purandar Sasvad, Kadur, B P Ghat, Karimganj, Gossaigaon and Chittar 7 each, Beki Mathungari, Amaravati, Sangamner, Gaganbawada,

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	Anakayam ARG, Chiplun, Raisingnagar, Mohol, Goalpara, Bhatinda IAF, Ambejogai/Mominabad, Chauldhowaghat, Belthangadi and Williamnagar 6 each, Tiring, Cherrapunji (rkm), Emerald, Pechiparai, Amraghat, Chakradharpur, Palsana, Bichhia, Konni ARG, Gheropara, Prakasam Barrage, Pathapatnam, Vaibhavwadi, Savlivivir ARG, Ashti, Vaijapur, Ghansawangi, Jagalbet, Athni, Yargatti, Jewargi, Santhebennur, Barobhisha, Labpur, Kurudamanni, Karnal, Bhatinda AMFU, Mallaoit, Bahraich, Kakerdarighat, Tokapal, Umreth, Sattenapalle, Palera, Cherthala AWS, Aryankavu, Ponnani, Ottapalam and Chaibasa 5 each
6 Oct	Sullurpet and Kancheepuram 18 each, Thenmala ARG 16, Ottapalam 15, Satyabama Uty ARG, Kelambakkam, Vellayani AWS, Venkatagiri, Vembakkam and Kvk Kattukuppam ARG 11 each, Cooch Behar, Cheyyar, Kodur and Bastanar 10 each, Vepur, Gudalur, Sriperumbudur, Ponneri, Tiruvallur, Paramakudi, Arakonam and Thiruvallangadu 9 each, Cholavaram, Ramnagar, Airport Chakka ARG, Tambaram, Sholinganallur, Tirupuvanam, Jagalbet, Thottambedu and Karkala 8 each, Sholingur, Perunchani Dam, Cheranmahadevi, Suralacode, Enamakal, Pechiparai, Poondi, Ambathur, Kashinagar, Taramani ARG, Walajabad, Cheyyur, Uthiramerur, Nilakottai, Kalavai AWS, Gudur, Thamaripakkam, Adampur, Tada, Valpoi, Virinjipuram AWS, Melalathur, Kottigehara, Konanur, Uthukottai, Manamadurai, Bodla and Haldwani 7 each, Arkalgud, Gummidipoondi, Neyyattinkara, Periyakulam, Palasamudram, Wallajah, Srikalahasti, Marakkanam, Pullampeta, Trivandrum AP, Pernem, Vellore, Thiruvananthapuram, Mauganj, Arabhavi ARG, Sargur, Mahabalipuram, Lalgari, Poonamallee, Valparai PTO, Maya Bandar, R.k.pet, Hebburu and Nidige 6 each, Tiruthani, Ammundi, Gudiyatham, Vadapudupattu, Chembarabakkam, Tiruttani PTO, Ponnai Dam, Ettayapuram, Arani, Chengalpattu, Manjalaru, Bhairamgarh, Satyavedu, Tirupati AP, Pandharpur, Dharmasthala, Mangaluru, Castle Rock, Haliyal, Londa, Ksndmc Campus, Somwarpet, Tyagarthi, Tantloi, Taoru, Alapuzha, Tirupathur, Keerampara ARG, Pattembi, Vilangankunnu ARG, Pallahara, Betanati, Lumding, Mangkolemba, Arundhutinagar, Thirupporur, Chittar, R.s.mangalam, Kaveripakkam, Sivaganga and Agumbe 5 each
7 Oct	Panjim 18, Malvan 15, Mormugao - Pmo IMD 14, Quepem, Chitradurga and Mapusa 13 each, Sanguem and Akole 11 each, Vengurla - IMD Pt, Ulhasnagar and Anavatti 10 each, Pernem, Valpoi, Hosadurga, Lepakshi, Margao and B Durga 9 each, Banavasi, Londa, Chilamathur and Devala 8 each, Kalyan, Pavagada, Karwar, Pimpalgaonbaswant ARG, Amarapuram, Ambernath, Canacona, Sawantwadi, Hindupur, Madakasira and Karjat ARG 7 each, Janmane, Ajjampura, Gowribidanur, Bidi, Chiplun, Hiriya HMS, Tbia IMD Part Time, Jagalbet and Mulde ARG 6 each, Perinthalamanna, Davanagere, Ukhrul, Vadakkancherry, Angadipuram, Ottapalam, Mannarkkad, Haflong AWS, Lonavala ARG, Yagati, Kelvarkop, Yellapur, Mundgod, Kiravatti, Kadra, Castle Rock, Vadgaon Maval, Bathalapalle, Chandgad, Kudal, Dodamarg, Tadimarri, Dharmavaram and Lalgudi 5 each
8 Oct	Pallipattu and Nambulipulikunta 15 each, Malkangiri 14, Car Nicobar IAF and Gyalsing PTO 12 each, Car Nicobar 10, Thambalapalle, Chintamani PTO, Hut Bay, Koppal and Nagari 9 each, Tirla, Pennagaram, Hindupur, Sira and Chikkanahalli AWS 8 each, Pavagada, Sambepalle and Bathalapalle 7 each, Sabroom, Silvassa, Vapi, Pakala, Rayalpadu and Madanapalle 6 each, Valsadkavkaws, Kalakada, Sholingur, Kuppam, Jharnapani, Tezpur, Lakkireddipalle, Cuttack, Madhugiri, Dhar Dharmasagar, Perur, Chiplun, Port Blair, Belthangadi, Hukkeri and Madhugiri ARG 5 each
9 Oct	Long Island 28, Saroornagar 15, Gundagurthi and Car Nicobar IAF 13 each, Pattembi 12, Shriramsag.pocha, Kochi IAF, Karipur Ap., Poonjar AWS, Royachoti and Lakkireddipalle 11 each, Shadnagar, Port Blair, Palluruthy ARG, Peermade To, Maganoor, Simhadripuram, Kalwakurthy, Agaram Seegoor, Konni, Karur and Srimushnam 10 each, Kondapuram, Car Nicobar, Ibrahimpatnam, Kadiri AP, Vakkad AWS, Ernakulam South, Osmanabad, Thrithla and Anakayam ARG 9 each, Asansol, Hayathnagar, Jangaon, Golkonda, Enamakal, Thodupuzha and Seethathode AWS 8 each, Keerampara ARG, Kochi C.i.a.l., Punalur, Bhuvanagiri, Kayamkulam ARG, Thodupuzha ARG, Kottayam, Alapuzha, Atmakur Wnp, Muvattupuzha ARG, Perambalur, Neeleswaram ARG, Peringalkuthu AWS, Thanjai Papanasam, Thenmala ARG, Valod, Makthal, Bachhanpet, Kadiri, C Belagal, Gonegandla, Owk, Maya Bandar, Bumpur, Vempalle, Cherthala, Manopad and Chinna Chinta Kunt 7 each, Raichur PTO, Sendurai, Padinjathara Dam AWS, Kozha, Vellanikkara, Kottarakkara AWS, Kozhikode, Achampeta, Vaikom, Sethiathope, Kakkayam AWS, Marpalle, Kurnool, Manjeri, Irinjilakuda, Ottapalam, Mannarkkad, Kodungallur, Hyathnagar (ARG), Idukki, Mohkheda, Yadagirigutta, Khanitar, Devala and Alwaye PWD 6 each, Gudur, Obuladevaracheruvu, Samayapuram, Musiri, Valangaiman, Vallam, Tiruvaiyaru, Vadakkancherry, Nallamada, Maheswaram, Labbaikudikadu, Chettikulam, Pelandurai, Sirkali, Chinnakalar, Sholayar, Valparai PTO, Valparai Taluk Office, Devanakonda, Chittar, Nandavaram, Manthralayam, Kohir, Gandhari, Sira, Vicarabad, Ghattu, Khila Ghanpur, Pebbair, Wanaparthi, Multai, Alampur, Aiza, Kayamkulam, Mavelikara, Kannur, Yacharam, Pakyong, Waddepalli, Kottigehara, Konni ARG, Mohol, Orvakal, Pattikanda, Yemmiganur, Perinthalamanna, Vallur, Kanjirappally, West Kallada AWS, Kollegal, Ghansawangi, Brahmavar AWS, Aryankavu, Kalgi, Saidapur, Piravam and Utukuru AP 5 each
10 Oct	Golkonda (ARG) and Ahmednagar - IMD Pt 12 each, Trimbakshwar 11, Dgp Office 10, Hyderabad AP, Amadagur, Gondal, Ankleshwer and Renapur 9 each, Hosapete, Sudhagad Pali, Munirabad ARG, Ankola and Malshiras 8 each, Kottasangani, Jajireddigudem, Tavaragera, Athni, Basagod, Eraiyur, Chinchwad - ARG, Kavathe Mahakal and Bhor 7 each, Tasgaon, Prathipadu, Obuladevaracheruvu, Devala, Valsad, Munirabad, Dharamtull, Tozhudur and Kallamb 6 each, Vakkad AWS, Barapani, Tirumalagiri (ARG), Labbaikudikadu, Saroornagar, Mudhole, Suigam, Devarakonda, Bazarhathnoor, Shidlaghatta, Saidapur, Kurdi, Bhalki, Ilkal, Gokarna, Sangola, Pune, Poladpur, Kambadur and Rabbkavi 5 each
11 Oct	Vaikom 11, Ariyalur 10, Tirla 9, Rayadurg, Mannargudi, Veeraganoor, Puducherry, Eraniel, Chandgad and Sholinganallur 7 each, Vedaranniyam, Nagar Kurnool, Perumkadavila ARG, Durgachack, Thenparanadu, Thalaigayyer, Kayamkulam ARG and Muthupet 6 each, Orthanad, Padegaon ARG, Osmanabad, Gingee, Subramanya, Alapuzha, Grand Anaicut, Haliyal, Hosadurga, Madikeri PTO, Hogenekal, Nedumangad, Kollam Rly and Perungalur 5 each
12 Oct	Karipur Ap. 25, Mannarkkad 24, Kozhikode 22, Anakayam ARG 19, Vadakara, Bengaluru Kial and Quilandi 18 each, Pattembi, Peringalkuthu AWS and Kannur 17 each, Mahe 15, Punalur and Tellichery 14 each, Parumbikulam, Vadakkancherry, Chinnakalar

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TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	and Keerampara ARG 13 each, Mattannur ARG, Sira, Bargur and Thodupuzha ARG 12 each, Thrithla, Thodupuzha, Vellarikkundu AWS, Cheruthazham ARG, Valparai PTO, Vyanthala ARG, Nilambur and Angadipuram 11 each, Ariyalur, Thenmala ARG, Perinthalamanna and Hindupur 10 each, Irikkur, Manjalaru, Thanjavur, Labbaikudikadu, Konni, Madhugiri, Bukkapatna, Kakkayam AWS, Devala, Aryankavu, Sholayar, Kottigehara and Hosdurg 9 each, Nannilam, Palakkad, Manalmedu, Valpoi, Kuppam, Pechiparai, Valparai Taluk Office, Tozhudur, Chittar, Peermade To, Kottarakkara AWS, Valangaiman, Muvattupuzha ARG and Mannargudi 8 each, Perumpavur, Alathur, Kayamkulam ARG, Cherthala, Badnawar, Manjeri, Ponnani, Pavagada, Vakkad AWS, Nippani, Seethathode AWS, Hoskote, Thirumanur, Channagiri, Vallam, Perunchani Dam, Annigere Ars, Ottapalam, Ketti, Poonjar AWS, Neeleswaram ARG, Kanjirappally, Kumbakonam and Perungalur 7 each, Thiruvudaimaruthur, Chalakudi, Enamakal, Vellankkara, Maddur, Suralacode, Tirukoilur, Jayamkondam, Rolla, Panchapatti, Thirukoilur ARG, Shidlaghatta, Srimushnam, ITC Jala, Hogenekal, Kudulu, Yercaud, Panniyoor ARG, Anchal ARG, Kurudamannil, Mani, Thuraiyur, Manapparai, Chiplun, Sangameshwar Devrukh, Ksndmc Campus, Nagapattinam, Thanjai Papanasam, Uthagamandalam and Erimayur ARG 6 each, Kodavasal, Needamangalam, Sirkali, Mercara, Lagudi, Tiruvaiyaru, Thanjavur PTO, Thuckalay, Marakkanam, Talala, Natham, Siddapura ARG, Bherya, Bhagamandala, Hiriyyur HMS, Gowribidanur, Empri, Kelvarkop, Siddapura, Chikkanahalli AWS, Kota, Brahmavar AWS, Mangaluru AP, Panambur, Belthangadi, Gaganbawada, Channapatna, Kayamkulam, Pelandurai, Chittur, Maduranthagam, Amini, Irinjalakuda, Neyyattinkara, Nedumangad, Kollamkode, West Kallada AWS, Mavelikara, Kollam Rly, Idukki, Munnar Kseb, Kochi C.i.a.l., Alwaye PWD, Taliparamba and Agati 5 each
13 Oct	Udupi and Brahmavar AWS 23 each, Mangaluru AP 19, Belthangadi 18, Mangalore/P.bur and Mudubidre 17 each, Dharmasthala, Mangaluru and Mani 14 each, Kota 13, Puttur HMS 12, Sulya ARG and Karkala 11 each, Bellur, Cheruthazham ARG, Taliparamba and Chintamani 10 each, Vitla ARG, Davanagere, Hosdurg, Panniyoor ARG, Mattannur ARG, Kannur and Vellarikkundu AWS 9 each, Kakkayam AWS, Kudulu, Maya Bandar, Jayapura and Subramanya 8 each, Hiriyyur HMS, Vadakara, Quilandi, Iगतपुरी, Bellatti, Rasipuram, Sringeri HMS, Irikkur, Kanakapura, Chengalpattu and Koyyalagudem 7 each, Manjeri, Sirkali, Enamakal, Koratur, Vadakkanchery, Vellankkara, Thamaraiyarkkalam, Melalathur, Sondwa, Kozhikode, Kottigehara, Dindori, Kelvarkop, Kolar G.f. and Hole Honnur 6 each, Devala, Karjat ARG, Ambemath, Ulhasnagar, Cheyyar, Ernakulam South, Ichangi, Budalur, Kochi IAF, Anavatti, Kammardi, Kozha, Sholayar, Sholinganalur, Thirukalukundram, Atmakur, Channapatna and Thali 5 each
14 Oct	Kansabati Dam 10, Vembakkam, Electronic City ARG, Uthiramerur and K.m.koil 8 each, Sirkali, Anchal ARG, Chintapalle, Long Island, Empri and Chintamani PTO 7 each, Jhargram PTO, Palluruthy ARG, Rampurhat (DRMS), Manalmedu, Erimayur ARG and Bankura (CWC) 6 each, Uthukottai, Tiruvallur, Thottambedu, Penucondapuram, Thenmala ARG, Maya Bandar, Magadi, Mavelikara, Kayamkulam ARG, Midnapore, Srikalahasti, Manteswar, Sri Niketan, Labpur, Narayanpur, Gheropara and Ernakulam South 5 each
15 Oct	Tekkali 7, Paradeep Cwr 6, Kalingapatnam, Channagiri, Hut Bay, Srimushnam and Vepur 5 each
16 Oct	Palasa 14, Hassan, Berhampur, Nedumangad, Burgampadu and Ichchapuram 11 each, B'chalam/Kothagu, Konni, Mulakalpalte and Palawancha 10 each, Mandasa and Gopalpur 9 each, Tenughat, Tekkali, Sompeta and Thenmala ARG 8 each, Konni ARG, Aryankavu, Kottarakkara AWS, Dharmapuri PTO, Aswapuram, Dharmapuri, Pandherikawara, Hut Bay and Jnanabharathi Bu Campus 7 each, Kanyakumari, Yanam, Vellayani AWS, Thiruvananthapuram, Neyyattinkara, Ponnai Dam, Cholavaram, Nagercoil, Paralakhemundi, Belthangadi, Bengaluru HAL AP, Barrackpur (Iaf), Zarizamni and Mahendragarh 6 each, Digapahandi, Kottaram, Hazaribagh, Barhi, Nuagada, Sriperumbudur, Masulipatnam Cdr, R.udaigiri, Tamsi, Kalingapatnam, Pathapatnam, Koyyalagudem, Kukulnora, Polavaram, Ponda, Konanur, Gundala, Mohana, Dummugudem, Kothagudem, Balkonda, Kayamkulam, Kurudamannil, Airport Chakka ARG, Trivandrum AP and Anchal ARG 5 each
17 Oct	Peermade To 29, Papanasam and Kanjirappally 27 each, Pechiparai 22, Chittar and Thodupuzha ARG 20 each, Periyar, Aryankavu, Poonjar AWS and Idukki 17 each, Seethathode AWS, Mahe, Gangadhara and Panambur 15 each, Irikkur and Panniyoor ARG 14 each, Kochi C.i.a.l., Thekkadi, Muvattupuzha ARG, Neeleswaram ARG and Perumpavur 13 each, Palakkad and Taliparamba 12 each, Thenmala ARG, Punalur, Angadipuram, Perunchani Dam, Pattedmi and Mandasa 11 each, Irinjalakuda, Suralacode, Vyanthala ARG, Ponnampet PWD, Saroornagar, Konni, Konni ARG, Mangaluru, Kakkayam AWS, Manimitharu, Tekkali, Dharmasthala, Kurudamannil and Alathur 10 each, Jadcherla, Cheveilla, Balasore, Mehkar, Lonar, Perinthalamanna, Kodungallur, Chinnakalar, Mettur, Alwaye PWD, Hulsoor, Ernakulam South and Kathlapur 9 each, Peringalkuthu AWS, Vaikom, Varkala, Kottayam, Khaknar, Nedumangad, Tellichery, Myladumpara ARG, Piravam, Mannarkkad, Manchal, Narsapur, Sholayar, Kabi, Devala, Hingoli - Hydromet, Manora, Gudalur and Risod 8 each, Munnar Kseb, Neapanagar, Alapuzha, Cheruthazham ARG, Mylaudy, Sargur, Kochi IAF, Sulya, Sonpeth, Kollam Rly, Thodupuzha, Vellarikkundu AWS, Valparai Taluk Office, Billoli, Kozha, Kottarakkara AWS, Ambasamudram, Vadakara, Kallamnuri, Jamner, Husnabad (ARG), Balajipeta, Parumbikulam, Bhograi, Bapatla, Ranjal, Medchal, Tekmal, Chhatrapur, Balipatna, Konaraopeta, Nandipet, Tamsi, Valparai PTO, Khanpur and Venkatapur 7 each, Himaytnagar, Alladurg, Mangrulpir, Chegunta, Bhokar, Anchal ARG, Nilanga, Dharmabad, Kannur, Bhokardan, Gopalpur, Metpalle, Darwha, Vepada, Santhapur, Erimayur ARG, Parvathipuram, North Paravur AWS, Garugubilli, Bondapalle, Thrithla, Kandhar, Mukhed, Gangakhed, Jaipur, Peddamandadi, Malegaon, Kondapak, Maya Bandar, Makloor, Bhadrak, Bodhan, Bengaluru Kial, Jaleswar, Thenkasi, Ayikudi and Manvat 6 each, Nh5 Gobindpur, Buldana, Bhoothapandy, Kottaram, Padinjaraathara Dam AWS, Vytthiri, Nagercoil, Thiruvananthapuram, Neyyattinkara, Thuraiyur, Jajpur, Vepur, Kuppady, Chandikhol, Tirtol, Dhannagar, Coimbatore AWS, G Bazar, Deogarh, Shencottah, Aska, Akhuapada, Kayamkulam ARG, Kollamkode, Humnabad, Sindkhed Raja, Shegaon, Khamgaon, Chikhli, Telhara, Patur, Digha, Suri PTO, Port Blair, Magadi, Krishnarajpet, Manthala, Siddapura ARG, Digras, Siddapura, Vitla ARG, Sulya ARG, Hadgaon, Partur, Manjlegaon, Raver, Muktainagar/Edalabad, Salur, Seethanagaram, Merakamudidam, Chintapalle, Ballarpur, Pusad, Ottapalam, Jagadevpur, Nilambur, Quilandi, Kumarakam, Palluruthy ARG, Mattannur ARG, Mavelikara, Paleru Bridge, Jhirnya, Gogawan, Hatpiplaya, Bhainsdehi, Vicarabad, Jogipet, Umerkhed, Shadnagar, Ibrahimpatnam, Chandurthi, Navipet, Bheemgal, Bhainsa (ARG), Uppal (ARG), Chigurumamidy, Banswada (ARG), Banswada, Mallial, Mallapur, Yeotmal and Washim 5 each

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
18 Oct	<p>Karhal 31, Kanth 27, Jaleswar 22, Bhandar 17, Badoda, Champawat and Kishanganj 16 each, Narwar 15, Banbasa, Moradabad CWC and Bhind 14 each, Rajghat, Chandanpur, Lohaghat, Sapotra and Peringalkuthu AWS 13 each, Dhampur, Digha, Mirganj, Sambhal and Hindaun 12 each, Khilchipur, Irinjalakuda, Bulandshahr, Sholayar, Neeleswaram ARG, Jhargram PTO, Canning, Chandpur, Karauli, Banki, Jamsolaghat, Shyampur, Susner and Tanda (kasba) 11 each, Niwari, Datia Dabra, Guna Kodungallur, Haldwani, Diamond Harbour, Ichhawar, Amroha, Valparai PTO, Chinnakalar, Hamirpur and Pohri 10 each, Jhansi, Nilgiri, Bijnor, Enamakal, Perumpavur, Chachoda, Moradabad, Khurja, Amalner, Bhitwarwar, Vijaypur (adp), Sarangpur, Moradabad, Nainital, Palwal, Depalpur, Kolaras, Lodi Road, Safdarjung and Pithoragarh 9 each, Kharagpur (I.i.t), Mangrol, Bangiriposi, Veerpur, Midnapore (CWC), Midnapore, Nagina, Sonkatch, Baheri, Gulana, Khatima, Nawana, Remuna, Suar, Mahidpur, Rupbas and Mohanpur 8 each, Jasrana, Hamirpur CWC, Shahjina Fm, Kalaikunda (Iaf), Rampur, Valparai Taluk Office, Contai, Lalitpur, Durgachack, Hathras, Ater, Mawana, Meerut, Vadakara, Moman Badodiya, Niwali, Muzaffarnagar, Muzaffarnagar Teh, Harda, Anupshahr, Badarwas, Punasa Dam, Daitari, Baran, Aya Nagar, Gwalior, Banera SR, Aswapuram, Gautampura, Kashipur, Khategaon, Seodha (seondha), Sikandarabad, Hatpiplaya, Sironj, Orchha, Bareilly CWC, Dwarhat, Narsingarh, Mukteshwar, Nalkhed and Navibagh Aet 7 each, Gohad, Jawar, Nasrullahganj, Roan, New Harsud, Kochi C.i.a.l., Bamori, Mihona, Burhanpur, Lateri, Ghatigaon, Mau, Hoshangbad Peermade To, Narora, Nagar SR, Bijoliya SR, Fatehgarh CWC, Khandar SR, Gheropara, Sangod, Raghunathpur, Devala, Telhara, Balasore, Kotkasim SR, Sama, Palam, Rairangpur, Pantnagar, Dharchula, Patti, Tensa, Raver, Parumbikulam, Chandausi, Vellanikkara, Vadakkancherry, Nawabganj, Chalakudi, Uluberia, Erandol, Budhana, Vyttiri, Ponnani and Dharangaon 6 each, Jarmindi, Chaibasa, Chakradharpur, Ghatsila, Ghatiya, Bairad, Karera, Periyar, Poondi, Ganjbasoda, Asansol, North Paravur AWS, Thodupuzha, Tarana, Bhograi, Thodupuzha ARG, Aryankavu, Kanjirapuzha ARG, Thritla, Seethathode AWS, Varkala, Mattannur ARG, Padinjathara Dam AWS, Jaipur, Tiring, Sohawal, Tigiria, Derabis, Satna (raghurajnar), Marsaghai, Betanati, Vidisha, Samakhunta, Udala, Shirpur, Barod, Shujalpur, Bhilwara, Sps Mayur Vihar, Delhi Ridge, Sports Complex AWS, Kathumer, Atru SR, Anta SR, Pahari SR, Jahazpur, Gangolihat, Bhilwara Tehsil SR, Bundi, Bhainsroadgarh SR, Gangrar, Mandana SR, Gangapur, Tulsipur, Pusa AWS, Berinag, Khairagar, Manteswar, Bhadgaon, Chopda, Muktainagar/Edalabad, Parola, Yaval, Soegaon, Mangalkote, Panagarh (IAF), Betalghat, Barrackpur (Iaf), Dum Dum, Tusuma, Lalgarh, Ballabgarh, Lansdown, Bhagwanpur, Malihabad, Atrauli, Shajapur, Mhow, Mehgaon, Khaknar, Bhopal Arera Hills, Kannod, Tonkhurd, Aron, Khirkiya Suvasara, Lahar, Goharganj, Biaora, Pachore, Tal, Piploda, Budhni, Kalapipal, Gormi, Chachariyapati, Sahaswan, Kalpi Tehsil, Baghpat, Bareilly PBO, Syana, Aliganj, Jalesar, Tundla, Kalpi CWC, Nauganava Sadat, Dummugudem, Sasni, Sadabad, Sikandra Rao, Bilari, Sardhana, Jansath, Milak and Akola 5 each</p>
19 Oct	<p>Baheri 54, Tirwa 41, Pantnagar and Nainital 40 each, Mukteshwar 34, Haldwani 33, Lohaghat 32, Betalghat 27, Nawabganj 26, Jalalabad and Bilaspur 25 each, Dhaurahara, Laharpur and Bareilly CWC 23 each, Almora 22, Pithoragarh and Sama 21 each, Loharkhet and Dharchula 20 each, Joshimath and Champawat 19 each, Bareilly PBO, Fatehgarh CWC and Dwarhat 18 each, Darjeeling, Ranikhet (g), Mirganj and Kashipur 17 each, Majitar, Kapkot, Chaukhtia and Bageshwar (thmo) 16 each, Pedong, Pati and Sukiapokhri 15 each, Kotdwar, Kalimpong, Muhammadi and Someshwar 14 each, Banbasa, Karnaprayag, Srinagar, Ghatampur, Simula, Puranpur, Khanitar, Khatima and Kanpur 13 each, Garud, Gairsain, Rongli, Deoprayag and Dabri Fm 12 each, Kalpi Tehsil, Pauri, Jarmindi, Manihari, Shahjahanpur, Berinag, Munsiyari, Shahjahanpur, Rudraprayag, Maudaha, Dhumakot, Kalpi CWC and Damthang 11 each, Chamoli, Bahadurganj, Narora, Ganganagar, Gangolihat, Didihat, Rampur, Gunnaur, Pakyong, Gyalsing PTO, Canning, Gangtok and Lansdown 10 each, Singheshwar, Palliakalan, Faridpur, Sankalan, Satgaon, Mangan, Amfu Kalimpong, Milak, Monghyr, Ranipool, Dharmanagar/Panisagar, Prithvipur, Sambhal, Kannauj, Pawayan, Tanda (kasba) , Saurbazar, Khagadia, Tadong, Bhagalpur, Tehri (CWC), Diamond Harbour and Durgachack 9 each, Madhipura, Purulia, Tilhar, Jahanabad, Suar, Dentam, Agra (CWC), Sirmari B.pur, Kannauj Teh, Suri PTO, Messenjor, Hayaghat and Yuksom 8 each, Mawana, Galgalia, Lakhisarai, Bagati, Moharo, Pilibhit Tehsil, Sangla, Tehri, Jokihat, Bausi, Kadwa, Barauni, Sahebpur Kanal, Katihar North, Barari, Sabour, Sandesh, Nawana, Sikti, Hasanpur, Amroha, Bankura (CWC), Rajmahal, Nauhatta, Nichloul, Bhuban, Maheshi, Kharagpur (I.i.t), Rosera, Tirupuvanam, Ankinghat, Ajaigarh, Dhamnagar, Thalishain, Kabi, Nowgong, Champasari, BasirhatPTO and Salakhua 7 each, Kursela, Karanjia, Basua, Birpur, Gogri, Balipatna, Champua, Amfu Kakkdwip, Rupouli, Parbatta, Kauwakol, Dhanaulti, Kishanganj, Chandikhol, Udai Kishanganj, Thakurganj, Kumarkhand, Garhi, Baltara, Pipili, Singhik, Mankar, Najibabad (t), Tarva, Raiganj PTO, Ukhimath, Tilpara Barrage, Rajnagar, Mahoba, Nighasan, Bhatwari, Bankura, Uttar Kashi, Fatehpur, Sevoke, Gajoldoba, Dhampur, Cheria B.pur 1, Katoria, Ramnagar, Contai, Kamtaul, Barrackpur (Iaf), Bihpur, Matiyani and Chandankiary 6 each, Gohad, Lavkushnagar, Matijuri, Dumka, Ranganandi Nt Xing, Orchha, Kuru, Rishikesh, Reckong Peo AWS, Putki, Pali, Muvattupuzha ARG, Sikatia, Jaleswar, Jajpur, Kantapada, Godda, Panchet, Banki, Nandadih, Dunda, Kalpa, Suri (CWC), Mohanpur, Kodawanpur/C.b li, Amarpur, Narpatganj, Digha, Buxaduar, Kanth, Sadabad, Chandpur, Jaley, Shipgyar, Atrauli, Sardanagar, Barkot, Kanpur Teh, Tarabganj, Bindki, Kansabati Dam, Colgaon, Hathwa, Bagaha, Amaur, Nirmali, Supaul, Bhimnagar, Siswan, Samastipur, Tusuma, Purnea, Banmankhi, Tarapur, Jhajha, Sangrampur, Dharrhara, Murliganj, Suryagadha, Taibpur, Narendranagar, Uttar Kashi (CWC), Rongo, Balrampur and Bagdogra IAF 5 each</p>
20 Oct	<p>Gajoldoba 34, Sukiapokhri 28, Forbesganj 26, Bagrakote and Nirmali 25 each, Darjeeling, Hasanpur and Amfu Kalimpong 23 each, Neora 22, Sevoke, Rongo and Champasari 21 each, Kalimpong, Bagdogra IAF and Laharpur 20 each, Murti, Bhimnagar, Nagarkata and Pedong 18 each, Hasimara and Buxaduar 17 each, Rongli 16, Majitar, Basua, Pakyong, Jalpaiguri and Champawat 15 each, Bahadurganj, Taibpur and Falakata 14 each, Sikti, Tribeniganj, Damthang and Gangtok 13 each, Chargharia, Thakurganj, Kunda, Lohaghat, Cheria B.pur 1, Dhengraghat, Chengmari/Diana, Tadong and Domohani 12 each, Alipurduar (CWC), Alipurduar PTO, Kishanganj, Supaul, Gyalsing PTO, Jhanjharpur and Saulighat 11 each, Yuksom, Neemsar, Palliakalan and Samastipur 10 each, Narpatganj, Bhabhua, Shipgyar, Sankalan, Barobhisha, Barbigha, Balrampur, Mangan, Ranipool, Galgalia, Singheshwar, Kumarkhand, Madhwapur, Phulparas, Nh31 Bridge, Mukteshwar, Munsiyari, Dhaurahara, Singhik, Khatima and Pithoragarh 9 each, Kumargram, Sahebganj, Dhekiajuli, Maheshi, Guwahati City IMD, Nauhatta and Rosera 8 each, Kodawanpur/C.b li, Sama, Harnaut, Beki Mathungari, Banmankhi, Raiganj PTO, Dentam, Almora, Araria, Purnea, Mathabhanga, Gossaigaon, Aie Nh Xing, Nighasan, Mawsynram, Gangolihat, Didihat, Dharchula, Sheikhpura, Panbari, Amaur, Pusa and Chungthang 7 each, Bhalukpong,</p>

WEATHER IN INDIA

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	Vaishali, Manash Nh Xing, Majbat, Ramanujganj, Sholavandan, Pennagaram, Sabroom, Satankulam, Ranikhet (g), Berinag, Hayaghat, Chakia, Loharkhet, Muhammadi, Jokihat, Barari, Cooch Behar, Colgaon, Kursela, Kabi, Madhipura, Murliganj, Amfu Pundibari and Narhat 6 each, Dhubri IMD, Ramnagar, Ayodhya, Bihta, Banbasa, Cherrapunji (rkm), Chauldhowaghat, Dwarhat, Namthang, Udalguri AWS, Chepan, Beky Rly. bridge, Sitapur, Barpeta, Aryari, Rewaghat, Manihari, Saurbazar, Kadwa, Katihar North, Marsrakh, Marhaura/Amnaur, Sardanagar, Mahedi/Mehshi, Rajpur, Sandesh, Rajgir, Pratappur, Madhabarida, Itanagar and Bobbili 5 each
21 Oct	Halflong 13, Parumbikulam 12, Amfu Majhian, Pandavapura and Palluruthy ARG 11 each, A. P. Ghat 10, Raiganj PTO, Obuladevaracheruvu, Pasighat AP, Honakere, Enamakkal, Manamadurai, Sankarankoil, B. P. Ghat, Kochi IAF and Mannarkkad 9 each, Kokrajhar, Matijuri, Konni ARG, Kayamkulam, Mysuru PTO, Mandya PTO, Sholingur, Lakhipur, Peren Nsdma AWS, Uravakonda and Kayamkulam ARG 8 each, Cherrapunji, Silchar, Mawsynram, Ambalavayal, Bihpur, Basua, Baltara, Nongstein, Cooch Behar, Chottabekra, Naganahalli, Bilikere and R.k.pet 7 each, Cherrapunji (rkm), Gossaigaon, Dholai, Mangalapuram, Coonoor PTO, Amraghat, Vallam, Nallamada, Konni, Coonoor, Ernakulam South, Rayalpadu, Jangipur, Monghyr, Barobhisha, Vellanikkara and Peringalkuthu AWS 6 each, Kanjirapuzha ARG, Krishnarajpet, Puttur, Kayathar ARG, Kota, Nanguneri, Chintamani PTO, Chikkamagaluru PTO, Harangi, Manantoddy, Kothagiri, Ketti, G Bazar, Tamenglongi, Srirangapatna, Ponnani, Tiptur, Mathabhanga, Anini, Gogri, Khagadia, Khliehriat, Kuppady, Thodupuzha, Kanjirappally, Dhubri IMD and Vyttiri 5 each
22 Oct	Amaravathy Dam and Dharmavaram 10 each, Pasighat AP 9, Tuting, Thodupuzha and Bellur 8 each, Gingee, Aravakurichi, Atmakur and Channagiri 7 each, Kottigehara, Kanjirapuzha ARG, Anini, Kamatchipuram and ITC Jala 6 each, Shiralkoppa, Thirthahalli, Nagamangala, Hirekerur, Veerapandi, Vedasandur, Paramathivelur, K. paramathi, Poonjar AWS, Tamenglongi, Karimganj, Sakleshpura and Ariyalur 5 each
23 Oct	Alathur 12, Perundurur 9, North Paravur AWS 8, Erimayur ARG, Chalakudi, Mannarkkad and Kollamkode 7 each, Pakala, Govindpura AWS, Thrithla, Qazi Gund, Sathanur Dam, Khudwani ARG and Anantnag AWS 6 each, Uthukuli, Annur, Vyantthala ARG, Musiri, Edapadi, Anakapalle, Kodungallur, Myladumpara ARG, Always PWD, Udhampur (IAF), Banihal, Awantipur IAF, Kulgam AWS, Kukernag, Mysuru PTO, Belthangadi and Chickmagalur 5 each
24 Oct	Udhampur (IAF) 14, Konni ARG 13, Jammu AP 12, Konni 11, Yercaud 10, Bakore, Katra, Thodupuzha, Kakinada and Nakodar 9 each, Jammu, Hindupur, Thondebhavi and Dalhousi Alha AWS 8 each, Kottarakkara AWS, Punalur, Neyyattinkara, Tibri, Kawa AWS, Awantipur IAF, Chinnakalar, Periyar, Pahalgam, Khudwani ARG, Kapurthala, Qazi Gund, Kadra, Arkalgud, Kushtagi, Udayagiri and Bengaluru HAL AP 7 each, Zainapora ARG, Gowribidanur, Seethathode AWS, Lepakshi, Kota, Gummagatta, Batote, Kheri, Nurpur/Jassur, Kistwar AWS, Magadi, Reasi ARG, Amaravathy Dam, Anandpur Sahib, Phangota, Tiruvannamalai, Chikkanahalli AWS and Konibal 6 each, Kanjirappally, Royachoti, Dhariwal Irr, Kakkayam AWS, Sambepalle, Madakasira, Kodaikanal, Ramanathapuram, Tanuku, Dharapuram, Keelpennathur, Srivilliputhur, Peringalkuthu AWS, Banihal, Hungund, Karamchedu, Bargur, Ludhiana Irr, Pathankot IAF, Anupgarh Tehsil SR, Suratgarh, R L Bbmb, Bangana F, Una Rampur AWS, Kunigal, Una, Kukernag, Krishnarajasagara, Badarwah, Harapanahalli, Kollegal, Hesaraghatta and Bangana R 5 each
25 Oct	Pulipatti 11, Viralimalai, Khanna and Bilikere 10 each, Agarhara Konanduru and Nabha 9 each, Rajgarh, Kadambur, Avinasi, Kelvarkop and Bhagamandala 8 each, Thalaguppa, Kasauli, Bhadson Irr, Partapnagar REV, Nalagarh, Naganahalli, Mysuru PTO, Srirangapatna and Kalghatgi 7 each, Hunchadakatte, Irikkur, Sholayar, Tiruppur, Krishnarajasagara, Haveri Apmc, Mannarkkad and Agumbe 6 each, Keeranur, Annasaval, Needamangalam, Ponnamaravathi, Tiruvarur, Ammundi, Haveri E.e.o., Namakkal, Pakala, Peraiyur, Chittampatti, Krishnarayapuram, Natham, Naina Davi, Punganur, Samana, Samrala, Beri, Ramanagara, Akkialur, Mundgod, Belikeri and Aligarh 5 each
26 Oct	Srivaikuntam and Sathyamangalam 11 each, Mannarkkad, Avinasi and Alapuzha 8 each, Veerapandi, Muvattupuzha ARG and Bhavanisagar 7 each, Bhalukpong, Thodupuzha ARG, Satankulam and Konni 6 each, Londa, Tirumayam, Nedumangad, Vellarikkundu AWS, Peermade To and Agumbe 5 each
27 Oct	Sargur 9, Kanjirappally 6, PTO Koksar, Muvattupuzha ARG and Kurudamannil 5 each
28 Oct	Ponnani 12, Perumpavur and Kadambur 9 each, Muvattupuzha ARG, Piravam, Idukki and Kanjirappally 8 each, Paramakudi, Kayathar, Avinasi, Thenkasi, Mancompu and Kottayam 6 each, Paradeep Cwr, Seethathode AWS, Cheruthazham ARG, Kozhikode and Kayathar ARG 5 each
29 Oct	Nagapattinam 12, Karaikal 10, Tiruvarur 8, Vedaranniyam 7, Thuckalay 6, Anchal ARG, Thenmala ARG and Nannilam 5 each,
30 Oct	Srivaikuntam 18, Tuticorin and Parangipettai 17 each, Kamalapuram 16, Thoothukudi Port AWS and Puducherry 14 each, Tindivanam and Ottapadiram 13 each, Yanam and Varkala 12 each, Karaikal 11, Gingee and Ennore AWS 10 each, Trivandrum AP, Kelambakkam, Valinokam, Kashinagar, Kayalpattinam and Vanur 9 each, Neyyattinkara, Ambathur, Kadambur, Gopalpur and Tambaram 8 each, Vallur, Kayathar, Cuddalore, Palayamkottai, Thirupporur, Veeraghattam, Marakkanam, Cheyyar, Maniyachi, Chhatrapur, Manjalaru, Vaippar, Suralacode and Porumamilla 7 each, Needamangalam, Gummidipoondi, Sirkali, Sankarankoil, Vilupuram, Satyabama Uty ARG, Perunchani Dam, Panruti, Kayathar ARG, Kurinjipadi, Perambur, Atlur, Tirupati AP, Udayagiri, Seetharamapuram, Kandukur and Cholavaram 6 each, Valangaiman, Satankulam, Kodavasal, Tiruchendur, Red Hills, Guntur, Nanguneri, Bandhugaon, Gudivada, Venkatagiri, Seethanagaram, Therlam, Vizianagaram, Chapad, Pulivendla, R. Udaigiri, Digapahandi, Chengalpattu, Thiruvaidaimaruthur, Mahabalipuram, Neyveli AWS, Nagercoil, Repalle, Mayiladuthurai, Ramanathapuram, Wallajah, Kalavai AWS, Tirukattupalli and Pechiparai 5 each
31 Oct	Srungavarapukota, Chintalapudi and Hassan PTO 6 each, Sullurpeta, Kozhikode, Parangipettai, Mayiladuthurai, Manamelkudi, Ramanathapuram, Nannilam and Tiruvarur 5 each

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
1 Nov	Pandavaiyar Head, Sethiathope and Miryalaguda 9 each, Subramanya, Rapur and Tiruvarur 8 each, Vinjamur, Thiruthuraiipoondi, Kampasagar AP, West Kallada AWS, Kurudamannil, Parangipettai and Kurinjipadi 7 each, Chidambaram, Eraniel, Utukuru AP, Kandukur, Cholavaram, Kulasekarapattinam and Bhuvanagiri 6 each, Pullampeta, Cuddapah, Anchal ARG, Thodupuzha, Kayalpattinam, Valangaiman, Red Hills, Mannargudi, Needamangalam, Kodavasal, Bhagamandala, Puzhal ARG, Radhapuram, Grand Anaicut, Adirampatnam, Perungalur, Rasipuram, Kollidam, Neyveli AWS, Cuddalore, Nidamanur and Vedaranniyam 5 each
2 Nov	Marakkanam 20, Konni, Konni ARG and Seethathode AWS 15 each, Berhampur and Gopalpur 14 each, Enamakal and Kanjirappally 13 each, Nannilam, Ichchapuram and Cuddalore 12 each, Kurudamannil 11, Mudubidre, Vedasandur and Kollidam 10 each, Kurinjipadi, North Paravur AWS and Thiruthuraiipoondi 9 each, Kavali and Kottayam 8 each, Needamangalam, Kochi C.i.a.l., Palakonda (ARG), Palasa, Ariyalur, Kumbakonam, Nagapattinam, Panruti, Ramanathapuram, Paramakudi, Puducherry and Avalanche 7 each, Neyveli AWS, Kandukur, Konakanamitla, Thiruvidaimaruthur, Perinthalamanna, Manjeri, Anakayam ARG, Quilandi, Sirkali, Kaikalur, Kalingapatnam, Mattannur ARG, Kamudhi, Bheemavaram, Muthupet, Ayyampettai and Ponneri 6 each, Nellore, Coimbatore South, Raigarh, Mahabalipuram, Kalampur, Ongole, Narsapuram, Cumbum, Thirumanur, Pattembi, Minicoy, Padinjarathara Dam AWS, Vilangankunnu ARG, Kodungallur, Parangipettai, Kamatchipuram, Odanchatram, Angadipuram, Palluruthy ARG, Thalaigayner, Kochi IAF, Rajapalayam, Valangaiman, Ettayapuram, Vandavasi and Kannur 5 each
3 Nov	Peravurani and Adirampatnam 17 each, Bhuvanagiri 14, Nagapattinam 13, Sethiathope and Tozhudur 12 each, Vilangankunnu ARG, Perungalur, Kamalapuram, Kakkayam AWS, Karaikal and Labbaikudikadu 11 each, Agaram Seegoor, Manalmedu and Eraiyur 10 each, R.s.mangalam, Pattukottai and Thodupuzha ARG 9 each, Tiruvarur, Tondi, Tirupoondi, K.m.koil, Kanjirappally, Poonjar AWS, Vellanikkara, Manjalaru and Vallur 8 each, Thalaigayner, Nannilam, Veppanthattai, Vanur, Panchapatti, Virudachalam, Palavidithi, Chidambaram AWS, Devaruppal, Utukuru AP, Cuddapah, Jayamkondam, Mahabalipuram, Kannur, Chidambaram, Vadakara, Kozhikode, Vepur, Tellichery and Kotpad 7 each, Kottayam, Ponnani, Thodupuzha, Thiruvidaimaruthur, Farhatabad, Marakkanam, North Paravur AWS, Veeraganoor, Kalaburgi, Kalaburagi, Namakkal, Parangipettai, Cuddalore, Maduranthagam, Tambaram, Kvk Kattukuppam ARG, Chittar, Kollidam, Mayiladuthurai, Sendurai, Sirkali, Kurinjipadi, Puducherry, Annavasal and Perambalur 6 each, Vedaranniyam, Valparai, Ariyalur, Thirukalukundram, Gundlupet, Muddanur, Proddutur, Malkangiri, Gudur, Chapad, Cheyyur, Panruti, Palakurthi, Kelambakkam, Tiruvadanai, Neyveli AWS, Pandavaiyar Head, Tirupuvanam, Mimal, Gandarvakottai, Kumbakonam, Palayamkottai, Dharapuram, Chembarabakkam, Kodavasal, Maniyachi, Srimushnam, Ottapadiram, Musiri, Aruppukottai, Muvattupuzha ARG, Sankarapuram, Tirumayam, Odanchatram, Pelandurai and Perumpavur 5 each
4 Nov	Cheranmahadevi 13, Vilangankunnu ARG 10, Ambasamudram 9, Mandapam, Mahabalipuram and Palayamkottai 8 each, Markapur, Muvattupuzha ARG, Nanguneri, Manimutharu, Hassan PTO, Perunchani Dam, Jeypore, Dgp Office, Thirupporur and Kelambakkam 7 each, Aryankavu, Rameshwar ARG, Peravurani, Kandukur and Thodupuzha ARG 6 each, Konni ARG, Parumbikulam, Kadambur, Pamban, Cuddalore, Chittar, Mulde ARG, Ayikudi and Seethanagaram 5 each
5 Nov	Bellur 12, Gobichettipalayam 11, Naganahalli, Rasipuram and Bhatinda 8 each, Pelandurai, Salem, Jnanabharathi Bu Campus, Sivakasi, Kanakapura, Mysuru PTO, Srirangapatna, Maddur, Chamarajanagar and Peraiyur 7 each, Kovilpatti, Kayathar, Srivilliputhur, Attur, Tiruchengode, Pennagaram, Empri, Bengaluru City, Virudachalam, Konni, Chinchwad - ARG, Jayapura and Srimushnam 6 each, M. M. Hills, Karkala, Kumarapalayam, Chinnakalar, Magadi, Balehonnur and Agumbe 5 each
6 Nov	Kurinjipadi 16, Chidambaram 11, Thammampatty 10, Udupi, Pelandurai and Neyveli AWS 9 each, Bhuvanagiri 8, Mani, Tarangambadi, Chidambaram AWS, Kallikudi, Chikkanahalli AWS, Channapatna and Kota 7 each, Manamadurai, Kollidam, Bodinaickanur, Kovilankulam, Kollur, Madhugiri, Aduthurai AWS, Kamatchipuram, Tirumangalam and Chinnakalar 6 each, Palani, Mangaluru AP, Jayamkondam, Manjalaru, Maddur, Vadapudupattu, Ajjampura, Aruppukottai, Karkala, Subramanya, Yanam, Panchanahalli and Shirali 5 each
7 Nov	Dgp Office 23, Chennai (n) and Ambathur 21 each, Mgr Nagar 17, Anna Uty ARG 16, Puzhal ARG 15, Tada and Sullurpeta 14 each, Taramani ARG and Anna University 13 each, Chennai AP, Gudur and Venkatagiri 11 each, Belthangadi, Ennore AWS and Satyavedu 10 each, Mohanur, Rapur, Viralimalai, Valinokam, Kollur, Musiri, Peravurani, Tiruvadanai, Madurai/T.south, Gummidipoondi and Cholavaram 9 each, Nellore and Kodur 8 each, Red Hills, Manapparai, Subramanya, Devakottai, Alandur, Tondi, Karaikudi, Kulithalai, Krishnarayapuram, Sulya, Alangudi, Sargur, Rasipuram, Thogamalai and Panchapatti 7 each, Samayapuram, Kavali, Kuzhithurai, Kovilpatti, Surangudi, Koyyalagudem, Palavidithi, Srikalahasti, Tirupati AP, Thottambedu, Illuppur, Paramakudi and Vathalai Anaicut 6 each, Kottigehara, H. D. Kote, Chamarajanagar, Tambaram, Sholinganallur, Penagaluru, Pullampeta, Natham, Puttur HMS, Ponnamaravathi, Thiruchuzhi, Poonamallee, Perungalur, Mimal, Avalanche, Sankarankoil, Sendamangalam, Erumapatti, Chembarabakkam, Ponneri, Kovilankulam, Mayanur, Thamarapakkam, Uthukottai, Ettayapuram, Ottapadiram, Manamelkudi, Karur, Marungapuri and Mercara 5 each
8 Nov	Perambur 14, Cheyyur, Maduranthagam and Cholavaram 13 each, Red Hills, Ambathur, Poonamallee, Pallipattu, Gummidipoondi and Parangipettai 9 each, Alangayam, Marakkanam, Chengam, Uthukottai, Puducherry, Tambaram, Coimbatore South and Dgp Office 8 each, Ponneri, Sathanur Dam, Chengalpattu, Nungambakkam, Anna University, Thirukoilur ARG, Sriperumbudur and Mgr Nagar 7 each, Poondi, Ambur, Tirukoilur, Cuddalore, Chidambaram AWS, Thirukalukundram, Thamarapakkam and Satyabama Uty ARG 6 each, Satyavedu, Puttur, Chittoor, Tindivanam, Karaikal, Anna Uty ARG, Chennai AP, Peelamedu AP, Chembarabakkam, Vadapudupattu, Kvk Kattukuppam ARG and Wallajah 5 each
9 Nov	Cheyyur and Mahabalipuram 12 each, Kanjirappally 10, Marakkanam, Ottapadiram, Vanur, Chittar and Aryankavu 9, Sivagiri, Puducherry, Maduranthagam, Perinthalamanna and Angadipuram 8 each, Mylaudy, Pechiparai, Uthiramerur, Thenmala ARG and Thirukalukundram 7 each, Perambur, Kuzhithurai, Perunchani Dam, Thirupporur, Kelambakkam, Palayamkottai, Tindivanam and

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TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	Suralacode 6 each, Punalur, Konni, Vilupuram, Kurudamannil, Long Island, Kovilpatti, Vandavasi, Tiruvannamalai, Cheyyar, Shencottah, Bhoothapandy, Bhuvanagiri, Chidambaram, Chennai (n), Dgp Office, Mgr Nagar, Anna University, Chengalpattu and Vilangankunnu ARG 5 each
10 Nov	Tirupoondi and Nagapattinam 31 each, Karaikal 29, Vedaranniyam 25, Thalaigayyer 24, Thiruthurai 22, Peravurani 20, Tiruvarur 19, Karambakudi 18, Thanjavur and Tarangambadi 16 each, Madukkur and Pattukottai 15 each, Mayiladuthurai and Mannargudi 14 each, Nannilam, Adirampatnam, Manjalaru, Chidambaram AWS, Sirkali, Muthupet and Parangipettai 13 each, Ayyampettai, K.m.koil, Manalmedu, Kumbakonam and Valangaiman 12 each, Pandavaiyar Head, Kodavasal, Kollidam, Manamelkudi and Needamangalam 11 each, Thanjai Papanasam, Vallam, Cuddalore, Thanjavur, Avudayarkoil and Jayamkondam 10 each, Budalur, Tiruvaiyaru, Thiruvaidaimaruthur, Bhuvanagiri, Puducherry and Chidambaram 9 each, Mimisal, Neyveli AWS, Orthanad and Rasipuram 8 each, Agaram Seegoor, Thirumanur, Tirukattupalli, Panruti, Ariyalur, Sethiathope, Srimushnam, Arantangi and Kurinjipadi 7 each, Marakkanam, Sendurai, Grand Anaicut, Keeranur and Labbaikudikadu 6 each, Pullambadi, Tiruchi.palli AP, Pelandurai, Vepur, Virudachalam, Trp AP, Thuvakudi Imti, Ponmalai, Eraiyyur, Lalgudi, Thammampatty, Padalur, Perambalur, Alangudi, Gandarvakottai, Arimalam, Veeraganoor and Pudukottai 5 each
11 Nov	Tambaram 23, Cholavaram 22, Ennore AWS 21, Gummidipoondi, Aryankavu, Red Hills and Sullurpeta 18 each, Mahabalipuram 17, Dgp Office, Chennai (n) and Perambur 16 each, Thamarapakkam, Mgr Nagar and Ambathur 15 each, Tada, Anna University, Chennai AP and Taramani ARG 14 each, Chembarabakkam and Ponneri 13 each, Kelambakkam, Thirupporur, Satyabama Uty ARG and Thenmala ARG 12 each, Thirukalukundram, Kvk Kattukuppam ARG, Satyavedu and Poonamallee 11 each, Uthukottai, Tiruvallur, Marakkanam, Chengalpattu, Cheyyar, Hindusthan University and Sriperumbudur 10 each, Koratur, Poondi and Maduranthagam 9 each, Tirupati AP and Sholinganallur 8 each, Puttur, Konni ARG, Uthiramerur, Thiruvalangadu and Chittar 7 each, Bhuvanagiri, Nagari, Srikalahasti, Gudur, Thottambedu, Konni, Pallipattu, Sethiathope, Kayathar, Tiruttani PTO, Pechiparai, Thuckalay and Tiruthani 6 each, Punalur, Tindivanam, Satankulam, Kayathar ARG, Nellore, Vandavasi, Venkatagiri, Vembakkam, Cheyyar, Walajabad and Kodur 5 each
12 Nov	Kodur 17, Suralacode 15, Idukki 14, Rajampet and Perunchani Dam 13 each, Puttur and Nagari 12 each, Pullampeta, Perumkadavila ARG, Bhoothapandy, Wallajah, Thodupuzha, Pallipattu and Tada 11 each, Mylaudy, Cholavaram, Royachoti, Kavali and Penagaluru 10 each, Gummidipoondi, Thodupuzha ARG, Kalakada, Sambepalle, Satyavedu and Tirupati AP 9 each, Vembakkam, Uthukottai, Atmakur, Pakala, Dgp Office, Chhatrapur, Utukuru AP, Vempalle, Cuddapah, Thottambedu and Gundlupet 8 each, Peermade To, Neyyattinkara, Purushottampur, Srikalahasti, Kandukur, Alwaye PWD, Red Hills, Rapur, Mgr Nagar, Ponneri, Nagercoil, Katpadi, Venkatagiri, Vinjamur, Kottaram, Chinnamandem, Arakonam, Kalavai AWS, Kancheepuram, Sholingur, Yercaud, Atlur and Kadiri 7 each, Sullurpeta, Nellore, Gurrampakonda, Alandur, Nambulipulikunta, Amalapuram, Kadiri AP, Muvattupuzha ARG, Palamaner, Pulivendla, Lakkireddipalle, Chamarajanagar, Dharmapuri, Chengam, Kochi C.i.a.l., Ambur, Pechiparai, Sriperumbudur, Dharmapuri PTO, Taramani ARG, Chennai (n), Thiruvalangadu, Tiruvannamalai, Rayalpadu and Thirukalukundram 6 each, Walajabad, Tiruthani, Kanyakumari, Thambalapalle, Aska, Kuzhithurai, Pappireddipatti, Kelambakkam, Anna University, Marandahalli, Mahabalipuram, Perambur, Uthagamandalam, Chennai AP, Maduranthagam, Thuckalay, Keerampara ARG, Paramakudi, Poondi, Virinjipuram AWS, Vellore, Ponnai Dam, Ammundi, Irinjalakuda, Kodungallur, Kollegal, Tiruvallur, Gudur, Tiruttani PTO, R.k.pet, R.s.mangalam, Ambathur, Tirupathur PTO, Amadagur, Vadapudupattu, Vaniyambadi, Tirupattur, Obuladevaracheruvu, Tanakal, Madanapalle, Kaveripakkam and Danishpet 5 each
13 Nov	Purushottampur 15, Chhatrapur, Palasa and Berhampur 14 each, Neyyattinkara, Ichchapuram, Mandasa, Suralacode, Thuckalay, Aska and Vellayani AWS 13 each, Digapahandi, Bhanjagar, Perunchani Dam, Belaguntha and Puri 12 each, Banpur and Perumkadavila ARG 11 each, Nagercoil, Nedumangad, Eraniel, Sorada, Gopalpur and Sompeta 10 each, Krishnaprasad, Pechiparai, Kuzhithurai, Nayagarh, Kottaram, Chittar, Kendrapara and Jagannath Prasad 9 each, Mancompu and Trivandrum AP 8 each, Ernakulam South, Thenmala ARG, Mylaudy, Airport Chakka ARG, Bhimadole, Mahendragarh, Balikuda, Bhoothapandy, Odagaon and R.Udaigiri 7 each, Thiruvananthapuram, Pusapatirega, Tiruvuru, G. Udayagiri, Bolagarh, Punalur, Aryankavu, Tangi, Kochi IAF, Kavali, Mohana, Nuagada, Yanam, Badvel, Brahmagiri and Bayyaram 6 each, Ranastalam, Alipingal, Salur, Paralakhemundi, Tekkali, Chintalapudi, Cheepurupalle, Merakamudidam, Tirtol, Anakapalle, Colachel, Binjharapur, Nawana, Chinnakalar, Enkuru, Ranpur, Gania, Daspalla, Alapuzha, Alwaye PWD, Tiruvuru (ARG), Konni, Konni ARG, Marsaghai, Kalinga, Daringibadi, Amalapuram and Perumpavur 5 each
14 Nov	Perunchani Dam 22, Perumpavur, North Paravur AWS and Pandavapura 19 each, Alwaye PWD and Kurdeg 15, Suralacode, Dharmasthala, West Kallada AWS and Konni 14 each, Kanjirappally 13, Kodungallur, Chalakudi and Konni ARG 12 each, Peringalkuthu AWS, Pechiparai and Anchal ARG 11 each, Irinjalakuda, Mylaudy, Lailunga, Denkanikottai and Gheropa 10 each, Kayamkulam ARG, Mavelikara, Enamakkal, Alapuzha, Srirangapatna, Barur, Cherthala, Simdega, Thenmala ARG, Burnpur, Aryankavu, Vellanikkara, Kuzhithurai and Chittar 9 each, Muvattupuzha ARG, Hosdurg, Kottarakkara AWS, Madhabarida, Peermade To, Bhoothapandy, Nagercoil, Asansol, Nayagarh, Thuckalay and Neyyattinkara 8 each, Kurudamannil, Piravam, Pattikanda, Irikkur, Naganahalli, Kayamkulam, Pathalgaon, Uthangarai, Kalingapatnam, Bilikere, Raidih, Kumarakam, Chas, Pennagaram, Garadapur and Vadakkanchery 7 each, Piduguralla, Punalur, Bherya, Peringamala ARG, Perinthalamanna, Belthangadi, Kottaram, Chinnakalar, Keerampara ARG, Sandur, Ranchi, Arki, Maithon and Valparai PTO 6 each, Kakinada, Simula, Minicoy, Luchipur, Sri Niketan, Idukki, Macherla, Aska, Mysuru PTO, Aspari, Krishnarajasagara, Holenarasipura, Kampli, Visakhapatnam, Omalur, Sholayar, Orcha, Palluruthy ARG, Ernakulam South, Cheruthazham ARG, Panchet, Kottayam, Vaikom, Mannarkkad, Thodupuzha ARG, Narayanpur, Kunkuri, Duldula, Nedumangad, Tokapal, Radhapuram and Vakkad AWS 5 each
15 Nov	Mulki 19, Arasalu 14, Mudubidre 13, Punalur 12, Kota 11, West Kallada AWS, Karkala, Kayamkulam ARG and Hosdurg 10 each, Kayamkulam, Mavelikara, Dharmasthala, Kandukur and Bhadravathi 9 each, Konni, Hanamkonda, Koppa, Belthangadi, Shimoga and Tyagarthi 8 each, Cheruthazham ARG, Suralacode, Taliparamba, Konni ARG, Panniyoor ARG, Kujanga, Nedumangad,

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	Vilupuram, Shikaripur, Navile AWS, Holalur, Vembakkam, Perunchani Dam, Pechiparai and Vepur 7 each, Chendipada, Mani, Kurudamannil, Tarikere, Kadiri, Airport Chakka ARG, K.m.koil, Manjalaru, Kallakurichi and Chittar 6 each, Neyyattinkara, Thiruvananthapuram, Racherla, Trivandrum AP, Mangaluru, Kadiri AP, Thenmala ARG, Vaikom, Kumarakam, Mogullapalle, Rajapur, Kuchinda, Gurundia, Warangal AP, Jayamkondam, Satyakonda, Satyakonda, Sholayar, Padalur, Viralimalai, Thenparanadu, Kansabel, Anchal ARG, Alapuzha, Derabis, Haripad, Balikuda, Dharmasagar, Peermade To, Vellarikkundu AWS, Reamal and Vanur 5 each
16 Nov	Bhanjagar 14, Kamareddy, Madukkur and Chettikulam 10 each, Karwar and Machareddy 9 each, Ichchapuram and Banarpal 8 each, Domakonda, Ranpur, Yellareddypeta, Sirsilla, Thiruthuraipoondi, Vaikom, Hassan PTO, Kozha and Mancompu 7 each, Siddipet (ARG), Gambhiraopet, Chigurumamidy, Kandukur, Grand Anaicut, Kozhikode, Subramanya, Long Island, Gania, Chikballapura, Sringeri HMS, Vepada, Srungavarapukota, Kotrageda and Kakatpur 6 each, Kavali, Udayagiri, Nedumangad, Cumbum, Ksndmc Campus, Kumarakam, Thambalalalle, Mavelikara, Nugehalli, Thenparanadu, Kodur, Penagaluru, Lalgudi, Krishnagiri, Tirukattupalli, Naga Reddipet, Bengaluru City, Bengaluru HAL AP, Channapatna, Narsinghpur, Kankadahad, Belaguntha, Madhabarida, Daspalla, Tadwai, Tirupuvanam, Huzurabad, Ramgundam, Chittar, Kota, Kallikudi, Thalaignayer, Pudukottai, Veeraganoor, Sivaganga and Panchanahalli 5 each
17 Nov	Lohandiguda 13, Mangalapuram 11, Tellichery 9, Haliyal, Dodamarg and Penu Konda 8 each, Kadra, Harur, Katpadi, Uravakonda and Karwar 7 each, Pavagada, Madakasira, Kannur, Tirupuvanam, Mettur, Chettikulam, Taliparamba, Avanihada, G Udayagiri, Chengam, Vengurla - IMD Pt, Valpoi and Vadakara 6 each, Sutagatti Mattikoppa, Veligandla, Panniyoor ARG, Mahe, Kamudhi, Tirupathur PTO, Tirupattur, Natrampalli, Arimalam, Palacode, Marandahalli, Chandgad, Sawantwadi, Devgad, Guhagarh, Pernem, Kottigehara, Londa, Bailhongal, Manchikere and Dharwar S.f. 5 each
18 Nov	Dharapuram 13, Thanjavur 12, Sankarankoil and Chettikulam 11 each, Ayyampettai, Hirekerur, Sular and Atlur 10 each, Bhavanisagar, Surangudi, Srivaikuntam, Kayathar, Valangaiman, Needamangalam, Palayamkottai, Odanchatram, Tirupati AP and Penagaluru 9 each, Sattur, Atmakur, Palladam, Budalur, Avalanche, Valparai Taluk Office and Kayalpattinam 8 each, Chinnakalar, Kodavasal, Tiruppur, Vallur, Kayathar ARG, Utukuru AP, Avinasi, Ambasamudram, Veerapandi, Gudalur, Palani, Virudhunagar, Thanjai Papanasam, Tiruvaiyaru, Thottambedu, Vinjamur, Rajampet, Tozhudur, Madurai Airport, Cuddapah and Srikalahasti 7 each, Tiruvarur, Thalaignayer, Mannargudi, Thiruthuraipoondi, Thuvakudi Imti, Tirupoondi, Aruppukottai, Maniyachi, Lakkireddipalle, Savanur, Kariyapatti, Vilathikulam, Sivakasi, Emeralad, Peelamedu AP, Kumbakonam, Peermade To, Watrap, Thanjavur PTO, Sullurpeta, Aranmanaipudur, Thiruchuzhi, Uthagamandalam, Cheranmahadevi, Pullampeta, Nanguneri and Agaram Seegoor 6 each, Tada, Rapur, Soundatti (s.f), Kovilankulam, Mundgod, Thenparanadu, Devala, K. R. Nagara, Thirumanur, Pollachi, Valparai PTO, Cuddalore, Vepur, Kodaikanal, Kallikudi, Tirumangalam, Kollidam, Mangalapuram, Labbaikudikadu, Samayapuram, Alangudi, Karambakudi, Perungalur, Attur, Sivagiri, Pattukottai, Tirukattupalli, Uttamapalayam, Nannilam, Muthupet, Kadambur, Vaippar and Karaikal 5 each
19 Nov	Nambulipulikunta 24, Tindivanam 22, Puducherry 19, Marakkanam, Sambepalle, Vilupuram, Pulivendla, Royachoti, Tirukoilur, Vempalle and Gingee 18 each, Kancheepuram, Malur and Bangarpet 17 each, Kalakada, Lakkireddipalle and Vanur 16 each, Tiruvannamalai, Obuladevaracheruvu, Kolar G.f., Chinnamandem, Gubbi and Tumakuru 15 each, Thandampettai, Kadiri, Vembakkam, Cuddalore, Uthangarai, Uthiramerur and Palamaner 14 each, Tirupathur PTO, Keelpennathur, Vaniyambadi, Alangayam, Sankarapuram, Amadagur, Harur, Nallamada, Simhadripuram, Pakala and Thottambedu 13 each, Thambalalalle, Palacode, Utukuru AP, Kodur, Atlur, Dharmavaram, Kalavai AWS, Kadiri AP, Srikalahasti, Natrampalli, Tirupattur, Chittoor, Pallipattu, Penu Konda, Wallajah, Chengam and Electronic City ARG 12 each, Cuddapah, Cheyyar, Rajampet, Barur, Gurrankonda, Vandavasi, Gorantla, Tanakal, Tirupati AP, Srinivasapura, Mulbagal, Pencondapuram, Kandukur and Palasamudram 11 each, Krishnagiri, Shoolagiri, Vadapudupattu, Venkatagiri Kota, Punganur, Hoskote, Cholavaram, Erandol, Kuppam, Ulundurpet, Denkanikottai, Raptadu, Singanamala, Venkatagiri, Arani, Salumber, Thondebhavi, Shidlaghatta, Pullampeta, Chikkanahalli AWS, Cheyyur, Chintamani and Anantpur 10 each, Bengaluru Kial, Ambur, Amalapuram, Bengaluru HAL AP, Hesaraghatta, ITC Jala, Uravakonda, Chenna Kothapalle, Chilamathur, Gowribidanur, Ramagiri, Chikballapura, Atmakur, Santhipuram, Sholingur, Hosur, Devanahalli, Dodbaballapura, Jhadol SR, Kaveripakkam, Pappireddipatti, Jammalamadugu, Kamalapuram, Vepur and Nedungal 9 each, Dharoi Colony, Dharmapuri PTO, Dharmapuri, Sullurpeta, Madhugiri, Ksndmc Campus, Rayalpadu, Puttur, Vellore, Hindupur, Lepakshi, Ganeshpur SR, Arcot, Kambadur, Manasa, Neemuch Sriperumbudur, Poondi, Chhotisadri, Kondapuram and Madanapalle 8 each, Kalyandrug, Madhugiri ARG, Udayagiri, Duvvur, Madakasira, Rapur, Tiruthani, Gudur, Nelamangala, Penagaluru, Vinjamur, Gudibande, Bengaluru City, Bathalalalle, Tilakwada, Idar, Proddutur, Badvel, Vallur, Vadali, Muddanur, Hosadurga, Raju Palem, Nagari, Sarara, Tiruvallur, Bargur, Arakonam, Uthukottai, Dungle SR, Kallakurichi, Badesar SR, Virinjipuram AWS, Ambathur, R.k.pet, Melalathur, Empri, Maduranthagam, Thamaraiappakkam, Pavagada, Tiruttani PTO, Kheralu and Avanihada 7 each, Thiruvalangadu, Pipalda SR, Kavali, Chapad, Paiyur AWS, Walajabad, Kampli, Panruti, Perambur, Malhargarh, Khedbrahma, Tambaram, Chengalputtu, Kotda SR, Hassan, Kvk Kattukuppam ARG, Repalle, Sira, Katpadi, Rayadurg, Polur, Ponnai Dam, Gudiyatham and Brahmasamudram 6 each, Rolla, Panniyoor ARG, Sanjeet, Jawad, Gooty, Kurinjipadi, Agali, Girva SR, Virudachalam, Marandahalli, Chennai AP, Dgp Office, Chennai (n), Dhariabad, Mgr Nagar, Molakalmuru, Anna Uty ARG, Amarapuram, Alandur, Bukkapatna, Mahabalipuram, Srirampura, Jnanabharathi Bu Campus, Vallabhagar, Mavli, Seetharamapuram, Reodar SR, Ramanagara, Rampura, Bari-sadri, Settur, Tiptur, Tadimarri, Tadpatri, Arogyavaram, Uttarahalli, Pamidi, Red Hills, Chembarabakkam, Hiriya HMS, Ongole, Begu SR, Magadi, Kunurpi, Yercaud, Thammampatty, Danishpet, Dunganpur Tehsil SR, Holalkere, Ammundi, Kollidam, Sangod, Guntakal, Ramganjmandi SR, Mandana SR and Dharangaon 5 each
20 Nov	Kelvarkop 19, Mangaluru 16, Hangal, Girva SR and Panambur 13 each, Jhadol SR and Ranebennur HOS 12 each, Amalapuram 11, Banavasi, Udaipur/D-aero and Channagiri 10 each, Akkialur, Anavatti, Bharamsagara, Hirekerur and Long Island 9 each, Danta,

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TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	Piravam, Guttal, Kotda SR, Palanpur, Begu SR, Shidlaghatta, Vellarikkundu AWS and Karamchedu 8 each, Vaikom, Kayamkulam, Tirupuvanam, Quilandi, Davangire T.o., Ichangi, Saraswati, Poshina, Mavli, Palsana, Quepem, Bangarpet, Maddur and Holakere 7 each, Kurudamannil, Vadgam, Savanur, Madhugiri, Kanjirappally, Haveri E.e.o., Patan, Peermade To, Ernakulam South, Cherthala, Vapi, Pallipattu, Uchangidurga, Bhopsalsagar SR, Vaniyambadi, Valsad, Holalur, Sami, Pudukottai, Bapatla and Devihosur Agro 6 each, Molakalmuru, Santhipuram, Kuppm, Car Nicobar IAF, Madhugiri ARG, Tadepalligudem, Tanuku, Janmane, Tiruchengode, Peringalkuthu AWS, Tyagarthi, Vansda, Mangaluru AP, Mundgod, Manchikere, Manki, Shiggaon, Ajjampura, B Durga, Gangrar, Chalakudi, Kapasan SR, Rashmi SR, Natrampalli, Thodupuzha, Kottayam, Perinthalamanna, Ponnani, Pattermbi, Thritla and Kolar G.f. 5 each
21 Nov	Pernem and Panjim 12 each, Puducherry 10, Puttur HMS, Dabolim N.a.s.- Navy and Kudathini 9 each, Sindhanur, Kudulu, Vanur, Ponnai Dam, Veppanthattai, Katpadi, Rampura and Nagarjuna Sagar (ARG) 8 each, Bestavaripeta, Mapusa, Kozhikode, Lalgudi, Kurugodu, Tadpatri, Grand Anaicut, Uravakonda, Maski, Sendurai, Mudgal and Mormugao - Pmo IMD 7 each, Vellore, Addanki, Manjalaru and Sethiathope 6 each, Guntakal, Gooty, Peapally, Muddanur, Palasamudram, Chittoor, Yelburga ARG, Kondapuram, Gurrankonda, Veligandla, Jamakhandi ARG, Santhamaguluru, Mundlamuru, Pulivendla, Mani, Karamchedu, Odanchatram, Bagalkote PTO, Bevoor, Gangavathi, Yelburga, Dhadesugur ARG, Sanguem, Narla, Tirukattupalli, Macherla, Alangayam, Ambur, Vaniyambadi, Pallipattu, Polur, Kumta, Canacona and Bagalkot 5 each
22 Nov	Ksndmc Campus 15, Parasia, Durg, Mana-Raipur-AP and Bapatla 7 each, Hesaraghatta, Belur, Magadi and Matheran 6 each, Racherla, Thane, Gudur, Labhandih, Vijayawada AP, Umreth, Hoskote and Gannavaram A. P. 5 each
23 Nov	Cholavaram, Aska and Red Hills 7 each, Kaprada and Myladumpara ARG 6 each, Seethanagaram, Merakamudidam, Garividi, Sankalan, Udumalpet, Rahuri, Sivagiri, Devala, Kamatchipuram, Sirpuru, Boath, Titlagarh and Phulbani 5 each
24 Nov	Bodinaickanur 13, Kozha 8, Muvattupuzha ARG 7, Sankarankoil, Myladumpara ARG and Palakkad 6 each, Noothankal, Kadaladi, Rameswaram, Ayikudi, Gudalur, Veerapandi, Surangudi, Irinjalakuda and Deodurg 5 each
25 Nov	Rameswaram 8, Tirupoondi and Amini 5 each
26 Nov	Kayalpattinam 31, Tuticorin 27, Tiruchendur 25, Nagapattinam 19, Srivaikuntam 18, Kulasekarapattinam 16, Vaippar 15, Ottapadiram, Satankulam, Tiruvaiyaru, Karaikal and Pelandurai 12 each, Sattur, Labbaikudikadu, Tirupuvanam, Palayamkottai, Peravurani and Srimushnam 11 each, Agaram Seegoor, Sivaganga, Budalur, Dindigul, Vembakottai and Tiruvarur 10 each, Nannilam, Kvk Kattukuppam ARG, Manimutharu, Maniyachi, Cheranmahadevi, Tambaram, Satyabama Uty ARG, Chembarabakkam and Kadambur 9 each, Tirupoondi, Ettayapuram, Veerapandi, Avudayarkoil, Mettupatti, Tirupathur, Ayyampettai, Papanasam, Thanjavur, Tirukattupalli, Ambasamudram, Eraiyur, Palani, Vepur, Odanchatram and Tozhudur 8 each, Virudachalam, Paramakudi, Karaikudi, Sendurai, Kallakurichi, Grand Anaicut, Thanjai Papanasam, Kamatchipuram, Port Blair, Marungapuri, Thiruvananthapuram, Sethiathope, Neyveli AWS, Kurinjipadi, Cuddalore, Pollachi, Chennai AP, Mgr Nagar, Anna Uty ARG, Thirumanur, Aruppukottai, Natham, Vadipatti, Rajapalayam, Pulipatti, K Bridge, Srivilliputhur, Sriperumbudur, Padalur, Sivakasi, Kallikudi, Sholavandan, Perambalur, Chittampatti and Kuzhithurai 7 each, Amaravathy Dam, Nanguneri, Manapparai, Suralacode, Tirumangalam, Annasaval, Dharapuram, Peraiyur, Thiruchuzhi, Pandavaiyar Head, Aravakurichi, Surangudi, Melur, Hindusthan University, Kayathar, Kelambakkam, Taramani ARG, Perunchani Dam, Pullambadi, Thuvakudi Imti, Keeranur, Kovilankulam, Tindivanam, Viralimalai, Tirukoiler, Thirukoiler ARG, Neyyattinkara, Ponmalai, Watrap, Pilavakkal, Pattukottai, Vallam and Andipatti 6 each, Airport Chakka ARG, Marakkanam, Lalgudi, Myladumpara ARG, Tiruchi.palli AP, Thanjavur, Trp AP, Virudhunagar, Ariyalur, Trivandrum AP, Thenparanadu, Thuraiyur, Perumkadavila ARG, Ayikudi, Kovilpatti, Kanyakumari, Avalanche, Tarangambadi, Sirkali, Tallakulam, Madurai Airport, Palavidithi, Pechiparai, Veppanthattai, Bhoopathandy, Kancheepuram, Kodaikanal, Sholinganallur, Chennai (n), Dgp Office, Anna University, Chettikulam, Arimalam, Kadalkudi, Gudalur, Thiruthuraiipoondi, Mannargudi, Muthupet, Udumalpet, Radhapuram, Vaigai Dam, Uttamapalayam, Aranmanaiapur, Mimalal, Kumbakonam, Madukkur, Sivagiri, Devakottai, Kamudhi, Tirumayam, Manamelkudi and Periakulum 5 each
27 Nov	Chengalpattu and Mahabalipuram 18 each, Thirukalukundram 16, Parangipettai, Maduranthagam and Cholavaram 15 each, Tiruvallur 13, Kancheepuram, Tambaram, Ambathur, Ponneri and Chembarabakkam 12 each, Koratur, Red Hills, Chidambaram AWS, Chidambaram, Karaikal and Thirupporur 11 each, Thamarapakkam, Perambur, Dgp Office, Sriperumbudur, Anna Uty ARG, Kelambakkam and Chennai (n) 10 each, Uthiramerur, Sirkali, Gummidipoondi, Poondi, Bhuvanagiri, Chennai AP and Kollidam 9 each, Ennore AWS, Thiruvalangadu, Vembakkam, Cheyyur, Satyabama Uty ARG, Mgr Nagar and K.m.koil 8 each, Cuddalore, Poonamallee, Gingee, Tiruvarur, Nannilam, Anna University, Walajabad and Nagapattinam 7 each, Marakkanam, Kodavasal, Vandavasi, Uthukottai, Mayiladuthurai, Manalmedu and Manjalaru 6 each, Arakonam, Tindivanam, Tarangambadi, Puducherry, Valangaiman, Rameswaram, Muthupet, Pandavaiyar Head, Panruti, Ayyampettai, Kurinjipadi, Thiruvidaimaruthur, Cheyyar, Papanasam, Chittar, Taramani ARG, Sethiathope, Srimushnam and Satyavedu 5 each
28 Nov	Mahabalipuram, Atmakur, Pamban and Mandapam 11 each, Nannilam 10, Nellore 9, Karaikal, Chidambaram AWS and Sirkali 8 each, Chengalpattu, Thanjavur, Kelambakkam, Manjalaru, Parangipettai, K.m.koil and Thirupporur 7 each, Satyavedu, Manapparai, Ponneri, Mayiladuthurai, Thiruvidaimaruthur, Thanjavur PTO, Thodupuzha, Bhuvanagiri, Budalur, Viralimalai and Kodavasal 6 each, Hindusthan University, Piravam, Cherthala, Sullurpeta, Kayamkulam, Tada, Venkatagiri, Marakkanam, Kancheepuram, Anna University, Needamangalam, Red Hills, Vallam, Thanjai Papanasam, Chidambaram, Kumbakonam, Ayyampettai, Tondi, Cuddalore, Thalaigayyer, Tirupoondi and Cholavaram 5 each
29 Nov	Gudur 19, Atmakur 18, Cuddalore 17, Alapuzha 15, Chittar 13, Uthukottai 12, Rapur, Parangipettai, Vinjamur, Thottambedu, Thuckalay and Puducherry 11 each, Srikalahasti, Tada, Sullurpeta, Mahabalipuram and Kuzhithurai 10 each, Sirkali, Tirupoondi, Pechiparai, Cholavaram, Kaveripakkam, Papanasam, Nellore, Vepur, Peringamala ARG, Kurinjipadi, Perumkadavila ARG, Atlur

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
	and Kodur 9 each, Manimutharu, Wallajah, Poondi, Kottarakkara AWS, Penagaluru, Nagapattinam, Kollam Rly, Manalmedu, Karaikal, Neyyattinkara and Vedaranniyam 8 each, Tiruvarur, Anchal ARG, Red Hills, Nedumangad, Ponneri, Gummidipoondi, Venkatagiri, Chengalpattu, Ulundurpet, Kalavai AWS, Suralacode, Chennai AP, Neyveli AWS, Panruti, Kollidam, Bhuvanagiri, Tarangambadi, Mayiladuthurai and Thalaigayyer 7 each, Perunchani Dam, Vanur, Sethiathope, Satyavedu, K.m.koil, Kancheepuram, Arakanam, Maduranthagam, Tambaram, Chidambaram AWS, Arcot, Marakkanam and Chidambaram 6 each, Srimushnam, Nagari, Vallur, Tirupati AP, Pullampeta, Rajampet, Badvel, Kamalapuram, Virudachalam, Chembarabakkam, Thirukoilur ARG, Ponnai Dam, Pallipattu, Chettikulam, Thamaripakkam, Thiruvallur, Agaram Seegoor, Vandavasi, Ammundi, Tindivanam, Udayagiri, North Paravur AWS, West Kallada AWS, Kozha, Kumarakam, Konni, Eraniel, Kavali, Uthiramerur and Poonamallee 5 each
30 Nov	Veerapandi 12, Seetharamapuram 11, Veligandla 10, Tirupuvanam, Vinjamur, Kayalpattinam, Papanasam, Porumamilla and Uthiramerur 9 each, Ayikudi, Mandapam, Paramakudi, Manimutharu and Ambasamudram 8 each, Kovilankulam, Sivakasi, Rameswaram, Mulbagal and Madurai Airport 7 each, Cholavaram, Kavali, Cheranmahadevi, Uttamapalayam, Gudalur, Thenkasi, Kayathar, Kaveripakkam, Valinokam, Tiruvadanai, R.s.mangalam, Maduranthagam, Orvakal, Usilampatti, Badvel and Watrap 6 each, Virudhunagar, Kallikudi, Mgr Nagar, Thirukalukundram, Srivilliputhur, Nanguneri, Marakkanam, Vaippar, Tiruchendur, Satankulam, Kvk Kattukuppam ARG, Cheyyar, Ponneri, Melur, Kamudhi, Kadaladi, Viraganur Dam, Peraiyur and Bharamsagara 5 each
1 Dec	Vandavasi 9, Sholingur and Vaikom 7 each, Srikalahasti and Kottayam 6 each, Diu, Kundapur, Car Nicobar, Veerapandi, R.k.pet, Tiruvannamalai, Katpadi and Shirali 5 each
2 Dec	Kottigehara 18, Umerpada and Malvan 15 each, Khandala Bavda 13, Palghar ARG, Daman ARG and Dahanu 11 each, Daman, Chinchwad - ARG, Valsad, Talasari, Bor, Panjim and Margao 10 each, Gokarna, Santacruz, Purandar Sasvad, Colaba, Satara, Tbia IMD Part Time, Akole, Mahabaleshwar, Hut Bay, Pardi, Wada, Vapi, Panvel ARG, Javali Medha, Khergam, Vikramgad and Khanvel 9 each, Kaprada, Murud, Silvassa, Dhule, Umergam, Mahalaxmi AWS, Mahuva, Padegaon ARG and Madhbn 8 each, Alathur, Ambeagaon Ghodegaon, Pune, Roha, Ambernath, Tala, Mangaon, Mokheda - Fmo, Khalapur, Ankola, Karjat ARG, Alibag - IMD Part Time, Haliyal, Daman Fmo, Shriwardhan, Velhe, Dangkvkaws, Waghai, Chikhli, Navsari, Palsana, Valsadkvkaws, Matheran, Junnar, Vadgaon Maval, Uran, Panhala, Kolhapur/Karvir IMD and Hatkanangale 7 each, Mormugao - Pmo IMD, Vandsa, Dangs (ahwa), Pen, Ukai, Nashik, Mhasla, Trimbakshwar, Jalalpor, Navasari AWS, Kamrej, Dabolim N.a.s. - Navy, Dharampur, Chandgad, Sangli, Kumta, Karwar, Talegaon AWS, Canacona and Devla 6 each, Guhagarh, Khed Rajgurunagar, Chiplun, Shirur Ghodnadi, Vaibhavwadi, Baramati, Sudhagad Pali, Lanja, Subir, Gandevis, Bardoli, Surat City, Suratkvkaws, Dolvan, Songadh, Valod, Vyara, Mapusa, Khed, Pernem, Poladpur, Mulde ARG, Quepem, Ajra, Akkalkuwa, Kalvan, Malegaon Camp - IMD Pt, Pimpalgaonbaswant ARG, Kavathe Mahakal, Mundgod, Erode, Bhira - IMD Part Time, Mahad and Nanipalson 5 each
3 Dec	Yagati 12, Ayikudi 8, Cheranmahadevi and Srivilliputhur 7 each, Kanyakumari, Sivagiri, Seethathode AWS and Vaibhavwadi 6 each, Ausa, Port Blair, Periyar, Vengurla - IMD Pt and Hosadurga 5 each
4 Dec	Aryankavu 11, Mohanur and Edapadi 9 each, Vembakottai 8, Mettur and Paradeep Cwr 7 each, Karur and Sankaridurg 6 each, Sompeta, Kalingsapatnam, Salem, Gopalpur, Rasipuram, Nanjanagud, Rahuri, Puri, Astaranga and Tiruchengode 5 each
5 Dec	Kodumudi and Chhatrapur 9 each, Purushottampur and Banpur 8 each, Coimbatore South 7, Nimpara, Digapahandi, Gopalpur, Paradeep Cwr, Ettayapuram, Nayagarh and Berhampur 6 each, Mohanur, Kantapada, Nanguneri, Peermade To, Tekkali, Astaranga, Chinnakalar, Channapatna, Alamatti HMS, Garadapur, Chandikhol, Balikuda and Vembakottai 5 each
6 Dec	Paradeep Cwr 20, Balikuda 15, Kujanga 14, Bagati, Garadapur, Veerapandi, Marsaghai and Burdwan PTO 13 each, Kakatpur and Kalyani Smo 12 each, Astaranga, Barrackpur (Iaf), Kharagpur (I.i.t), Tirtol and Mohanpur 11 each, Dum Dum, Vepur, Niali and Bodinaickanur 10 each, Midnapore, Midnapore (CWC), Mo Salt Lake, Uttamapalayam, Uluberia, Kalaikunda (Iaf), Raghunathpur and Derabis 9 each, Kendrapara, Agaram Seegoor, Mettupatti, Harinkhola, Myladumpara ARG, Alipingal and Pattamundi 8 each, Udumalpet, Perunchani Dam, Thenmala ARG, Srivilliputhur, Jagatsinghpur, Lalgargh, Chittar, Jhargram PTO, Canning, Durgachack, Manteswar, Alipore and Watrap 7 each, Nh5 Gobindpur, PTO Koksar, Andipatti, Labbaikudikadu, Chettikulam, Nimpara, Gudalur, Debagram, Jamsolaghat, Bishalgarh and Basirhat PTO 6 each, Chittur, Peringamala ARG, D.p.ghat, Chandbali, Tiruppur, Peermade To, Pipili, Banki, Kantapada, Adirampatnam, Pechiparai, Suralacode, Contai, Sankarapuram, Tozhudur, Sonamura, Belonia, Diamond Harbour, Baripada, Kaptipada, Digha and Nilgiri 5 each
7 Dec	Aryankavu 13, Sonamura and Udaipur 12 each, Arundhutinagar, Gokulpur AWS, Bishalgarh, Amarapur and Lembuchhera 11 each, Ayikudi and Agartala AP 10 each, Thenmala ARG and A D Nagar AWS 9 each, Periyar and Kvk South 8 each, Kvk Dhalai 7, Punalur, Khowai, Aizawl, Karimganj, Belonia, Kanchanpur, Dharmannagar/Panisagar, Kamalpur, Chhamonu and Lengpui 6 each, Mohanur, Viralimalai, Kailashahar AP, Shencottah, Thenkasi, Konni ARG and Gharmura 5 each
8 Dec	Amraghat 7, Dholai, Valparai PTO and Pilavakkal 5 each
9 Dec	Atmakur 5
10 Dec	Bhuban, Hassan PTO and Atmakur 5 each
11 Dec	Majuli 5
12 Dec	Cheyyar and Kavali 7 each, Mahabalipuram 6, K.m.koil 5

TABLE 5 (Contd.)

Date	Some representative amounts of rainfall in cm for October, November and December 2021 (5 cm and above)
13 Dec	Kancheepuram and Satyabama Uty ARG 5 each
14 Dec	Arcot and Marakkanam 5 each
15 Dec	Nil
16 Dec	Nil
17 Dec	Nil
18 Dec	Nil
19 Dec	Nil
20 Dec	Nil
21 Dec	Nil
22 Dec	Nil
23 Dec	Patsio 100
24 Dec	Nil
25 Dec	Patsio 100
26 Dec	Nil
27 Dec	Nil
28 Dec	Mavli 5
29 Dec	Ambabhona 11, Chas 8, Raipur, Jujumura and Kawardha 7 each, Gharghoda, Tirodi and Lormi 6 each, Takhatpur, Rajnandgaon, Labhandih, Mana-Raipur-AP, Mahasamund, Pandharia, Patan, Dhamdha, Bhatapara, Marwahi, Koner, Chanderdeepghat, Tirora, Goregaon, Arjuni Morgaon, Sindewahi, Malanjkhanda, Lahuni para, Burla, Reamal, Atabira and Bhayathan 5 each
30 Dec	Durg 10, Saraipali, Basana and Patan 7 each, Bijepur, Padampur, Bagbahara and Sambalpur 6 each, Bargarh, Baramkela, Mahasamund, Rajim, Chhura, Birmaharajpur, Balod, Sonapur, Ambabhona, Nawapara, Khairamal, Sohela, Paikmal, Jharbandh, Barpalli, Atabira and Mana-Raipur - A. P. 5 each
31 Dec	Dgp Office 24, Nungambakkam, Poonamallee, Mgr Nagar and Ambathur 20 each, Chembarabakkam and Anna University 19 each, Chennai AP, Anna Uty ARG and Perambur 15 each, Sholinganallur and Koratur 12 each, Sirkali 11, Red Hills, Poondi and Kollidam 10 each, Sriperumbudur, Kelambakkam, Cholavaram and Thamaraiykkam 9 each, Satyabama Uty ARG, Mayiladuthurai, Tambaram and Chidambaram AWS 7 each, Kvk Kattukuppam ARG, Chidambaram, Tiruvallur and Hindusthan University 6 each, Kalavai AWS, Arakonam, Cuddalore, Thuvakudi Imti, Satyavedu and Puttur 5 each

submerged under-water in Tamil Nadu. As a result of heavy rain, the Annamayya dam in Kadappa district of Andhra Pradesh breached around 5.30 am on November 19 submerging 10 villages and taking a toll of at least 38 lives. Flooding due to heavy rain caused damage to 1316 villages and damage to crops over 6.33 lakh hectares in Andhra Pradesh.

3.3. December

3.3.1. Storms and depressions

Cyclonic Storm, "Jawad" over Bay of Bengal was the first cyclone that formed over the north Indian ocean during the post monsoon season, the chief cyclone season. It formed over westcentral Bay of Bengal under the influence of a Low Pressure area over south Thailand and

neighbourhood, it concentrated into a Depression over southeast Bay of Bengal in the evening of 2 December (Fig.2). It encountered unfavorable conditions and gradually weakened into a Low Pressure area on 6 December, as this system attained intensity of cyclone and weakened before coming close to the coast; hence did not cause adverse weather associated with cyclones over Indian region. However, under the influence of this system fairly widespread to widespread rainfall / thunderstorm were reported over Odisha during 4 - 6 December, over Gangetic West Bengal during 5 - 7 December and over Nagaland, Manipur, Mizoram and Tripura during 6-8 December; it also caused heavy to very heavy rainfall over Odisha on two to three days and over Gangetic West Bengal on one day. In its initial stages, it also caused widespread rain / thunderstorm over Andaman and Nicobar Islands along with heavy rainfall on one day.

3.3.2. Weather and associated synoptic features

Table 4 gives a summary of the synoptic systems during the month of December 2021. The sub-division wise percentage departure of rainfall from normal and the significant amounts of rainfall during the month are given in Tables 1 and 5, respectively.

A Well Marked Low Pressure Area formed over south Andaman sea, off north Sumatra coast on 20 December, this low pressure system along with its associated cyclonic circulation caused *isolated to scattered* rainfall / thunderstorm over Andaman and Nicobar islands on two to three days and *isolated* rainfall / thunderstorm over South Peninsula on one or two days.

In the first week of the month a cyclonic circulation in the lower tropospheric levels over northeast and adjoining eastcentral Arabian sea, off south Gujarat-north Maharashtra coasts and its interaction with the high amplitude trough associated with an approaching western disturbance caused *fairly widespread to widespread* rainfall / thunderstorm activity over parts of Maharashtra and Gujarat region and *isolated to scattered* rainfall / thunderstorm occurred over Saurashtra-Kutch and southwest Madhya Pradesh; it also caused isolated heavy to very heavy rainfall over Konkan-Goa, Madhya Maharashtra and Gujarat region.

Under the influence of western disturbances, *fairly widespread to widespread* precipitation / thunderstorm activity was reported over Western Himalayan Region on two to three days during the first and fourth week of the month which caused *isolated to scattered* rainfall / thunderstorm over adjoining plains of northwest India on one-two days.

Movement of easterly waves caused *isolated to scattered* rainfall / thunderstorms over parts of south Peninsular India and Lakshadweep islands. Under its influence, *isolated heavy* rainfall also reported over Coastal Andhra Pradesh, Yanam, Tamil Nadu, Puducherry and Karaikal on three to four days and over adjoining areas of east India on one-two days.

Some of Stations received record of 24-hour rainfall. A list of stations is given below with their previous record and date:

Station	24 hr. record rainfall in December 2021 (mm)*	Date	Previous rainfall record (mm)	DD-MM-YYYY
Lengpui	57.4	7	35	10-12-2010
Agartala Aero	104.3	7	69.3	25-12-1991

Bagati	130.2	6	80.6	29-12-1977
Digha	46.9	6	27.5	14-12-1997
Dumdum	96.8	6	94.1	11-12-1981
Canning	67	6	27.8	12-12-2012
Kalaikunda (Iaf)	89.6	6	75.4	12-12-2012
Midnapore	92.2	6	62	21-12-1914
Paradeep Cwr	200.5	6	98	09-12-2017
Baripada	51	6	27.1	10-12-1973
Mahuva	81	2	15	22-12-1980
Bharuch	42.4	2	4	06-12-2017
Valsad	96	2	62	06-12-2017
Mandvi	37	2	20.1	16-12-1967
Surat City	48	2	42.2	20-12-1933
Akole	91	2	58.1	16-12-1967
Colaba-Imd Obsy	90.2	2	82.2	06-12-2017
Alibag – Part Time	71.2	2	62.7	13-12-2014
Matheran	71	2	21	06-12-2017
Kolhapur/ Karvir Imd	69	2	51.7	06-12-1962
Nashik-Imd Obsy	63.8	2	31	16-12-1967
Pune Ap Lohegaon Imd Pt	86.2	2	58.8	02-12-2008
Pune City- Imd Obsy	75.4	2	53.1	13-12-2014
Sangali -Imd Obsy	57.8	2	16	06-12-1993
Mahabaleshwar-Imd Obsy	92	2	70.2	12-12-1965
Satara- Imd Obsy	92.5	2	65	12-12-1987
Tbia Imd Part Time	90.2	2	20.2	06-12-2017
Nandurbar	42	2	25.8	23-12-1980
Santacruz- Imd Obsy	91.2	2	53.8	06-12-2017
Dahanu- Imd Obsy	114.4	2	104.7	06-12-2017
Panjim - Imd Obsy	102.9	2	100.8	11-12-1965
Bilaspur	20	29	18.6	09-12-2010
Mana – Raipur Ap	50	29	29.9	09-12-2010
Raipur	66.6	29	64.1	09-12-2010
Rajnandgaon	53	29	29.4	18-12-1997
Valparai Pto	51	8	47.6	01-12-2008
Chikkanahalli-Aws	17.5	5	3.2	06-12-2012
Durg	99.6	30	41	02-12-1978

*Based on real – time available data

Source : IMD Diagnostics Bulletin of India Dec 2021

3.3.2. Temperature

Under the influence of dry northwesterly winds, *Cold day to Severe Cold* day conditions at *isolated / few places* had occurred over Madhya Pradesh, Uttar Pradesh, Punjab and Himachal Pradesh. *Cold day* conditions at a

few places with *Severe Cold* day conditions at *isolated* places had occurred over Madhya Pradesh on one each during last week of December. *Cold day* conditions at isolated places had occurred over Chhattisgarh on one day during last week of December.

Severe Cold wave conditions were observed at some places over Punjab, Haryana, Chandigarh, Delhi, Rajasthan, Madhya Pradesh, Saurashtra and Kutch on 1 to 3 days in the second fortnight of the month. *Cold wave* conditions were observed in the last fortnight of the month on a few days and were experienced in all the sub-divisions of Northwest India. They were also observed in the other sub-divisions of Bihar, Jharkhand, Gangetic West Bengal, Odisha, Vidarbha and Telangana.

The lowest minimum temperature recorded was -2.6 °C at Churu (west Rajasthan) on 19 December 2021 over the plains of the country.

Minimum temperatures were generally *normal* over the country but were *above normal* over pockets of Maharashtra, Chhattisgarh and east and northeastern sub-divisions.

3.3.3. Damages associated with the Disastrous weather events

As per media reports, due to unseasonal rain *rabi* crops, viz., maize, cotton, wheat, gram, strawberries, grapes, pomegranates, cashew and onion crops at ready to harvest stages were damaged in Goa and Maharashtra. Unseasonal rain along with cold weather led to death of more than 2000 sheep and goats in Satara, Ahmednagar and Pune district. A lightning strike led to death of a farmer in Amravati district and a bullock in Jalna district. Cyclone, "Jawad" caused the death of two persons in Srikakulam district of Andhra Pradesh due to falling of coconut tree. One farmer in Odisha (Ganjam district) committed suicide due to damage caused to his rice crops because of the storm.

The inputs received from the office of the Director General of Meteorology (Hydromet), New Delhi is duly acknowledged. Thanks are due to Smt. P. P. Kulkarni, S.A., Weather Forecasting Division, Pune for her assistance.

Appendix

Definitions of the terms given in 'Italics'

(A) Rainfall

(i) Percentage departure from normal

Large Excess : + 60 % or more

Excess : +20% to +59%

Normal : -19% to +19%

Deficient : -20% to -59%

Large Deficient : -60% to -99%

No Rain : -100%

(ii) Intensity (during the past 24 hours period ending at 0300 UTC)

Extremely heavy rainfall - 20.5 cm and above

Very heavy rainfall - 11.6 cm to 20.4 cm

Heavy rainfall - 6.5 cm to 11.5 cm

Heavy snowfall - 64.5 cm to 115.5 cm

(iii) Spatial distribution (percentage of the stations in a meteorological sub-division reporting a 24 hour rainfall of 0.1 mm or more)

At most places (Widespread) - 76% of stations gets rainfall

At many places (Fairly widespread) - (51-75)% of stations gets rainfall

At a few places (Scattered) - (26-50)% of stations gets rainfall

At isolated places (Isolated) - ≤25% of stations gets rainfall

(B) Monsoon activity

(i) Southwest monsoon

Vigorous - Rainfall exceeding 4 times the normal with, at least two stations reporting rainfall more than or equal to 8 cm along the west coast and 5 cm elsewhere. Rainfall in that sub-division should be fairly widespread or widespread

Active - Rainfall more than 1½ to 4 times the normal, with at least two stations reporting rainfall more than or equal to 5 cm along the west coast and 3 cm elsewhere. Rainfall in that sub-division should be fairly widespread or widespread

(ii) Northeast monsoon

Vigorous - Rainfall exceeding 4 times the normal with at least two stations

reporting rainfall more than or equal to 5 cm in coastal Tamil Nadu and south coastal Andhra Pradesh and 3 cm elsewhere in the northeast monsoon region. Rainfall in that sub-division should be fairly widespread or widespread

Active - Rainfall more than 1½ to 4 times the normal, with at least two stations reporting rainfall more than or equal to 3 cm in coastal Tamil Nadu and south coastal Andhra Pradesh and 2 cm elsewhere in the northeast monsoon region. Rainfall in that sub-division should fairly widespread or widespread

(C) Temperatures

(i) Maximum / Day temperature

Markedly above normal - When departure from normal is +5 °C or more

Appreciably above normal - When departure from normal is +3.1 °C to +5.0 °C

Above normal - Departure from normal is +1.6 °C to +3.0 °C

Normal - When departure from normal is +1.5 °C to -1.5 °C

(ii) Minimum / Night temperature

Based on the revised criteria which came into practice with effect from 2016, cold waves are declared based on the actual minimum temperatures. Cold wave is considered when the minimum temperature of a station is 10 °C or less for plains and 0 °C or less for hilly regions. Also to declare cold wave, the criteria should

be met at least in 2 stations in a met sub-division for at least 2 consecutive days.

Severe cold wave conditions - When the negative departure of minimum temperature from Normal is more than 6.4°C or when the actual minimum temperature is ≤ 2 °C over the plains

Cold wave conditions - When the negative departure of minimum temperature from normal is 4.5°C to 6.4°C or when the actual minimum temperature is ≤ 4 °C over the plains. For stations located over the coastal areas, when the minimum temperature departure is -4.5°C or more, 'Cold Wave' may be described if the actual minimum temperature is 15 °C or less

Cold day to severe cold day conditions - When the minimum temperature is 10 °C or less for plains and 0°C or less for hilly regions. Cold day may be described if the departure of maximum temperature is -4.5 °C to -6.4 °C and severe cold day when it is less than 6.4°C

Markedly below normal - When the departure from normal is -5°C to or less

Appreciably below normal - When the departure from normal is between -3.1 °C to -5.0 °C

Below normal - When the departure from normal is -1.6 °C to +3.0 °C

Normal - Departure from normal is -1.5 °C to +1.5 °C

