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Weather in India

HOT WEATHER SEASON (March-May 2021)†

1. Chief features

(*i*) The first depression of the season and the year 2021 was the depression over north Andaman Sea (2-3 April), followed by extremely severe cyclonic storm (ESCS) "TAUKTAE" over the Arabian Sea (14-19 May) and very severe cyclonic storm (VSCS) "YAAS" over the Bay of Bengal from 23 to 27 May.

(*ii*) The hot weather season 2021 was mild with *severe* heat wave*/ *heat wave* conditions manifesting in the last week of March, appearing intermittently in April and nearly absent in the month of May.

(*iii*) Rainfall in the month of March for the country was subdued, in April though deficient, the precipitation improved than March and unusually high in the month of May neutralizing the seasons deficiency.

(*iv*) Thunderstorms were observed from the second week of March over the country and were present throughout the season, being most frequent in the month of May.

(*v*) Southwest Monsoon advanced into some parts of south Bay of Bengal, Nicobar Islands, entire south Andaman sea and some parts of north Andaman sea on 21st May, 2021. It reached Kerala on 3rd June, two days behind its normal date, *i.e.*, 1st June.

2. Seasonal rainfall

The sub-division wise rainfall and its departure from *normal* for each month and season as a whole are given in Table 1. The sub-divisional rainfall departures for the season March-May 2021 are also depicted in Fig. 1.

The seasonal rainfall for the country was 118% of long period average (LPA), while the rainfall in the months of March (55% of LPA) and April (79% of LPA) were *deficient*. At the end of April, the cumulative departure from normal of March and April was about -30% of LPA which became +18% of LPA by the end of the season. Thus, rainfall in the month of May was the major contributor at 174% of LPA when all the homogenous regions received unusually high rainfall.

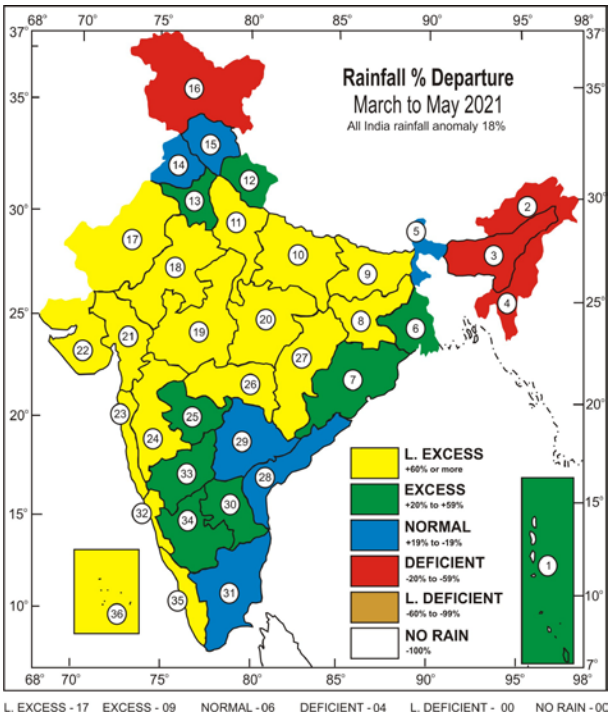

Fig. 1. Sub-divisional rainfall percentage departures (based on Operational data) for the season Mar-May, 2021. Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1	29	**7**	47	**13**	40	**19**	264	**25**	35	**31**	-4
2	-25	**8**	189	**14**	-10	**20**	311	**26**	62	**32**	194
3	-30	**9**	226	**15**	-12	**21**	802	**27**	137	**33**	43
4	-55	**10**	255	**16**	-26	**22**	1013	**28**	-1	**34**	28
5	6	**11**	124	**17**	75	**23**	435	**29**	12	**35**	107
6	53	**12**	57	**18**	287	**24**	92	**30**	39	**36**	153

The rainfall over 17 sub-divisions amounting to 52% area of the country recorded *large excess* rainfall, 9 sub-

**Definitions of terms in italics other than sub-titles are given in Appendix*

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TABLE 1

Sub-division rainfall (mm) for each month and season as a whole (March-May, 2021)

S. No.	Meteorological Sub-divisions	March			April			May			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	38.3	27.9	37%	150.2	74.2	102%	414.1	364.7	14%	602.6	466.8	29%
2.	Arunachal Pradesh	98.4	182.0	-46%	183.7	303.6	-39%	296.5	287.3	3%	581.5	772.9	-25%
3.	Assam & Meghalaya	43.5	77.3	-44%	102.1	193.9	-47%	272.5	316.6	-14%	414.0	587.8	-30%
4.	Naga., Mani., Mizo. and Tri.	36.4	66.2	-45%	41.5	148.0	-72%	138.8	268.8	-48%	216.7	483.0	-55%
5.	S.H.W.B.& Sikkim	57.5	55.6	3%	103.5	125.2	-17%	306.3	262.1	17%	467.3	442.9	6%
6.	Gangetic West Bengal	4.8	30.1	-84%	22.3	50.1	-55%	257.7	105.6	144%	284.9	185.8	53%
7.	Orissa	5.1	23.5	-78%	26.0	33.9	-23%	157.5	71.0	122%	188.6	128.4	47%
8.	Jharkhand	9.3	15.1	-38%	7.3	19.6	-63%	223.9	48.6	361%	240.5	83.3	189%
9.	Bihar	1.4	8.1	-82%	5.0	16.7	-70%	259.6	56.9	356%	266.0	81.7	226%
10.	East Uttar Pradesh	0.4	6.7	-94%	3.3	6.0	-46%	111.4	19.7	465%	115.0	32.4	255%
11.	West Uttar Pradesh	0.6	9.2	-93%	1.4	5.4	-75%	65.0	15.3	325%	67.0	29.9	124%
12.	Uttarakhand	11.0	54.9	-80%	57.7	34.8	66%	175.5	65.6	168%	244.2	155.3	57%
13.	Haryana, Chandigarh & Delhi	4.2	12.1	-65%	4.4	7.9	-44%	46.5	19.3	141%	55.2	39.3	40%
14.	Punjab	6.9	23.7	-71%	18.9	13.5	40%	23.9	17.9	34%	49.7	55.1	-10%
15.	Himachal Pradesh	41.7	110.9	-62%	111.8	65.7	70%	60.1	66.8	-10%	213.7	243.4	-12%
16.	Jammu & Kashmir and Ladakh	103.9	152.3	-32%	83.2	103.1	-19%	61.0	79.8	-24%	248.0	335.2	-26%
17.	West Rajasthan	1.0	4.5	-78%	2.6	4.9	-47%	35.7	13.1	172%	39.3	22.5	75%
18.	East Rajasthan	3.3	3.5	-5%	0.9	3.7	-75%	69.3	11.8	487%	73.5	19.0	287%
19.	West Madhya Pradesh	8.3	4.4	89%	0.7	2.1	-68%	38.0	6.4	493%	46.9	12.9	264%
20.	East Madhya Pradesh	7.0	10.8	-36%	2.2	4.8	-54%	87.8	8.0	997%	96.9	23.6	311%
21.	Gujarat Region	0.0	1.0	-100%	0.3	0.7	-62%	56.6	4.6	1130%	56.8	6.3	802%
22.	Saurashtra & Kutch & Diu	0.0	1.0	-100%	2.0	0.3	560%	42.6	2.7	1476%	44.5	4.0	1013%
23.	Konkan & Goa	0.2	1.0	-83%	3.9	2.0	93%	188.5	33.0	471%	192.5	36.0	435%
24.	Madhya Maharashtra	4.3	2.9	49%	16.7	7.2	132%	41.3	22.4	85%	62.4	32.5	92%
25.	Marathawada	6.1	6.0	1%	6.0	5.5	9%	24.8	15.9	56%	36.9	27.4	35%
26.	Vidarbha	11.7	10.4	13%	6.5	6.5	0%	26.2	10.5	150%	44.4	27.4	62%
27.	Chhattisgarh	4.0	10.6	-62%	18.1	12.4	46%	75.2	18.0	318%	97.3	41.0	137%
28.	Coastal A.P. & Yanan	0.7	13.5	-95%	26.3	22.3	18%	70.8	62.9	13%	97.9	98.7	-1%
29.	Telangana	0.4	12.3	-97%	23.4	17.6	33%	42.9	29.9	43%	66.7	59.8	12%
30.	Rayalaseema	0.0	9.3	-100%	31.7	18.7	70%	82.0	54.1	52%	113.7	82.1	39%
31.	Tamil Nadu, Pudcherry & Karaikal	7.4	21.4	-66%	36.8	39.5	-7%	76.6	64.5	19%	120.7	125.4	-4%
32.	Coastal Karnataka	16.5	7.8	112%	72.8	26.2	178%	367.7	121.7	202%	457.1	155.7	194%
33.	North Interior Karnataka	1.0	7.4	-86%	33.5	23.4	43%	79.8	49.2	62%	114.3	80.0	43%
34.	South Interior Karnataka	1.9	11.3	-83%	58.4	42.4	38%	118.8	86.7	37%	179.1	140.4	28%
35.	Kerala & Mahe	49.7	32.7	52%	127.6	105.1	21%	569.5	223.7	155%	746.8	361.5	107%
36.	Lakshadweep	9.3	10.7	-13%	95.8	35.2	172%	409.5	157.4	160%	514.6	203.3	153%

Note : Amounts less than 0.1 mm are rounded off to zero

TABLE 2

Details of the weather systems during March 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**) *Low Pressure area / Depression*						
1.	Low Pressure area	29 (eve) - 30	Equatorial Indian Ocean to the south of southeast Arabian Sea	West	Southeast Arabian Sea and adjoining Equatorial Indian Ocean	Under the influence of cyclonic circulation over Equatorial Indian Ocean & adjoining southeast Arabian Sea LPA formed. Associated cyclonic circulation extended upto 1.5 kms above m.s.l. Became less marked on 1 April
(**B**) *Western disturbances /eastward moving systems*						
(*i*) *Upper air cyclonic circulation*						
1.	At 3.1 kms above m.s.l.	2-3	North Pakistan and neighbourhood	East	Eastern parts of Jammu-Kashmir	Moved away northeastwards on 4
2.	Do	8 - 11 (Mor)	Do	Do	North Pakistan and Jammu-Kashmir	Initially it lay as a trough in westerlies at 5.8 km above m.s.l. ran roughly along Long. 56° E to the north of Lat. 28° N on 6 (morning). Then, it lay as a cyclonic circulation over Afghanistan & neighbourhood on same day. Again, it lay as a trough ran roughly along Long. 66° E to the north of Lat. 30° N on 7. Moved away east-northeastwards on 11
3.	Between 3.1 and 3.6 kms above m.s.l.	17 - 19 (Mor)	Do	Do	Eastern parts of Jammu-Kashmir and Ladakh	Moved away east-northeastwards on 19
4.	At 3.1 kms above m.s.l.	20-21	Do	Do	Jammu-Kashmir, Ladakh and neighbourhood	Moved away northeastwards on 22
5.	At 5.8 kms Above m.s.l.	27	North Pakistan and adjoining Jammu-Kashmir & Ladakh	Stationary	*In situ*	Moved away east-northeastwards on 28
6.	At 3.1 kms above m.s.l.	28-29	Afghanistan	East	North Pakistan and neighbourhood	Became less marked on 30
(*ii*) *As a trough*						
1.	At 3.1 kms above m.s.l.	1-2	Roughly along Long. 87° E to the north of Lat. 26° N	East	Along Long. 92° E to the north of Lat. 26° N	Became less marked on 3
2.	At 5.8 kms Above m.s.l.	3-7	Roughly along Long. 86° E to the north of Lat. 26° N	Do	Along Long. 90° E to the north of Lat. 22° N	Became less marked on 8
3.	At 3.1 kms above m.s.l.	4	Roughly along Long. 65° E to the north of Lat. 32° N	Stationary	*In situ*	It then lay as a cyclonic circulation over Jammu-Kashmir & Ladakh on 5 and became less marked on 6
4.	At 2.1 kms above m.s.l.	10	Roughly along Long. 88° E to the north of Lat. 25° N	Do	Do	Became less marked on 11

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	At 5.8 kms above m.s.l.	11 (Mor) -15	Roughly along Long. 54° E to the north of Lat. 25° N	East	Roughly along Long. 90° E to the north of Lat. 22° N	Moved away east-northeastwards on 15
6.	At 5.8 kms above m.s.l.	13 - 16 (Mor)	Roughly along Long. 52° E to the north of Lat. 30° N	Do	Roughly along Long. 72° E to the north of Lat. 25° N	Moved away east-northeastwards on 16
7.	At 2.1 kms above m.s.l.	15-16	Roughly along Long. 90° E to the north of Lat. 25° N	Do	Roughly along Long. 92° E to the north of Lat. 25° N	Moved away northeastwards on 17
8.	At 3.1 kms above m.s.l.	16 - 17 (Mor)	Roughly along Long. 72° E to the north of Lat. 30° N	Do	Roughly along Long. 75° E to the north of Lat. 32° N	Initially, western disturbance as a cyclonic circulation lay over north Pakistan and adjoining Jammu-Kashmir & Ladakh between 3.1 & 3.6 kms above m.s.l. on 15. Moved away east-northeastwards on 17
9.	At 1.5 kms above m.s.l.	17 - 19 (Mor)	Roughly along Long. 88° E to the north of Lat. 25° N	Do	Roughly along Long. 90° E to the north of Lat. 22° N	Moved away east-northeastwards on 19
10.	At 5.8 kms above m.s.l.	19	Southwest Rajasthan to northeast Arabian Sea across Saurashtra & Kutch	Stationary	*In situ*	Became less marked on 20
11.	At 3.1 kms above m.s.l.	19-21	Roughly along Long. 72° E to the north of Lat. 30° N	East	Roughly along Long. 85° E to the north of Lat. 28° N	It then lay as a cyclonic circulation over Sub Himalayan West Bengal & neighbourhood at 3.1 kms above m.s.l. on 22 and moved away east-northeastwards on 23
12.	At 5.8 kms above m.s.l.	21-26	Roughly along Long. 62° E to the north of Lat. 28° N	Do	Roughly along Long. 88° E to the north of Lat. 25° N	In between it lay as a cyclonic circulation over Afghanistan and neighbourhood with the trough aloft on 23. Moved away east-northeastwards on 27
13.	At 0.9 km Above m.s.l.	24	Roughly along Long. 88° E to the north of Lat. 22° N	Stationary	*In situ*	Became less marked on 25
14.	At 5.8 kms above m.s.l.	28-30	Roughly along Long. 86° E to the north of Lat. 28° N	East	Roughly along Long. 90° E to the north of Lat. 22° N	Became less marked on 31
15.	At 2.1 kms above m.s.l.	31 Mar	Roughly along Long. 88° E to the north of Lat. 23° N	Stationary	*In situ*	Became less marked on 1 April
16.	Between 3.1 & 3.6 kms above m.s.l.	31 Mar - 2 Apr	Roughly along Long. 72° E to the north of Lat. 32° N	East	Roughly along Long. 87° E to the north of Lat. 25° N	Became less marked on 3 April
(*ii*)	*As an Induced/Low/cyclonic circulation*					
1.	Up to 1.5 km above m.s.l.	4	Central Pakistan and adjoining west Rajasthan	Stationary	*In situ*	Became less marked on 5
2.	Up to 1.5 km above m.s.l.	6-9	Central Pakistan and neighbourhood	East	West Rajasthan and neighbourhood	Became less marked on 10
3.	Up to 1.5 kms above m.s.l.	11-15	Central Pakistan and adjoining west Rajasthan	Do	Southeast Rajasthan and neighbourhood	Became less marked on 16

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
4.	Upto 0.9 km a.s.l.	21-24	Central Pakistan and adjoining west Rajasthan	East	South Haryana and neighbourhood	Became less marked on 25
(**C**)	*Other upper air cyclonic circulations*					
1.	At 0.9 kms above m.s.l.	2-3	Madhya Maharashtra	Stationary	*In situ*	Became less marked on 4
2.	Upto 2.1 kms above m.s.l.	4	East Bangladesh and neighbourhood	Do	Do	Became less marked on 5
3.	At 1.5 km Above m.s.l.	4-5	Kerala	Do	Do	Became less marked on 6
4.	up to 0.9 km above m. s. l.	6-8	South Assam and neighbourhood	Oscillatory	South Assam and neighbourhood	Became less marked on 9
5.	Between 5.8 and 7.6 kms above m.s.l.	9	Assam and neighbourhood	Stationary	*In situ*	Became less marked on 10
6.	At 0.9 km above m.s.l.	9-10	West Vidarbha and neighbourhood	West	Marathwada and neighbourhood	Became less marked on 11
7.	Upto 0.9 km above m.s.l.	10	Jharkhand and neighbourhood	Stationary	*In situ*	Became less marked on 11
8.	Upto 0.9 kms above m.s.l.	10-11	Northwest Madhya Pradesh and neighbourhood	Oscillatory	Southeast Madhya Pradesh and neighbourhood	Became less marked on 12
9.	Upto 0.9 km a.s.l.	11	Comorin area and neighbourhood	Stationary	*In situ*	Became less marked on 12
10.	At 0.9 km above m.s.l.	12	North Madhya Maharashtra	Do	Do	Became less marked on 13
11.	At 0.9 km a.s.l.	16-24	Madhya Maharashtra	Oscillatory	Southeast Madhya Pradesh and neighbourhood	Became less marked on 25
12.	At 1.5 kms above m.s.l.	16-19	Central Pakistan	East	Southeast Rajasthan and neighbourhood	Became less marked on 20
13.	At 1.5 kms above m.s.l.	19-20	Equatorial Indian ocean and adjoining southwest Bay of Bengal off Sri Lanka coast	West	South coastal Tamil Nadu and neighbourhood	Became less marked on 21
14.	At 1.5 kms above m.s.l.	19-20	East Bangladesh and neighbourhood	East	Assam and neighbourhood	Became less marked on 21
15.	At 0.9 km above m.s.l.	22	Coastal Karnataka and neighbourhood	Stationary	*In situ*	Became less marked on 23
16.	Upto 1.5 km above m.s.l.	24	Madhya Maharashtra and neighbourhood	Do	Do	Became less marked on 25
17.	Up to 1.5 kms above m.s.l.	27	South Chhattisgarh & neighbourhood	Do	Do	Became less marked on 28
18.	Upto 0.9 km Above m.s.l.	27-28	Central Pakistan & adjoining west Rajasthan	East	East Rajasthan and neighbourhood	Became less marked on 29
19.	Upto 1.5 km above m.s.l.	28-29	Madhya Maharashtra & neighbourhood	South	South Maharashtra and neighbourhood	Became less marked on 30

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
20.	Upto 0.9 km above m.s.l.	29-31 Mar	Central Pakistan & neighbourhood	Stationary	*In situ*	Became less marked on 1 April
21.	Upto 4.5 km above m.s.l.	29-30 Mar	Southeast Bay of Bengal and neighbourhood	West	Southeast Bay of Bengal and adjoining south Andaman Sea	Under its influence, a low pressure area formed on 31 March & then intensify further. Details will be given in article on 'storms & depression in the north Indian ocean during 2021'
(D)	*East west trough*					
1.	Mean sea level	31 Mar - 1 Apr	East Uttar Pradesh to west Assam	Oscillatory	East Uttar Pradesh to Mizoram	Became less marked on 2 April
(E)	*Trough in easterlies/Trough of low*					
1.	At 1.5 km above m.s.l.	16	From north interior Karnataka to southwest Madhya Pradesh across interior Maharashtra	Stationary	*In situ*	Then, it lay as a trough /wind discontinuity from north interior Karnataka to southeast Madhya Pradesh across interior Maharashtra on 17 and became less marked on 18
2.	At 0.9 km above m.s.l.	23	From interior Tamil Nadu to north interior Karnataka across south interior Karnataka	Do	Do	Became less marked on 24
3.	Upto 0.9 km above m.s.l.	27	Lakshadweep-Maldives area to coastal Karnataka across Kerala	Do	Do	Became less marked on 28
(F)	*North-south troughs/Wind discontinuity/other troughs*					
1.	At 0.9 km above m.s.l.	7-8	Comorin area to north Tamil Nadu	East	Comorin- Maldives area to southeast Arabian Sea off north Kerala coast	It then lay as a cyclonic circulation over Comorin area and adjoining Sri Lanka on 9 and became less marked on 10
2.	Upto 0.9 km above m.s.l.	13	Gangetic West Bengal to Vidarbha across interior Odisha & south Chhattisgarh	Stationary	*In situ*	Became less marked on 14
3.	At 0.9 kms above m.s.l.	12-14	North Kerala to the cyclonic circulation over north Madhya Maharashtra	Do	Kerala to Madhya Maharashtra across interior Karnataka	Became less marked on 15
4.	Upto 1.5 kms above m.s.l.	20-21	Coastal Karnataka to Marathwada across interior Karnataka and south Madhya Maharashtra	Oscillatory	Coastal Karnataka to north Madhya Maharashtra across Goa	Became less marked on 22
5.	At 0.9 km above m.s.l.	25-26	Rayalaseema to south Odisha across coastal Andhra Pradesh	Do	Telangana to south Odisha across south Chhattisgarh	Became less marked on 27
6.	Upto 0.9 km above m.s.l.	31 Mar - 1 Apr	North interior Karnataka to south Kerala	Do	North interior Karnataka to south Tamil Nadu	Became less marked on 2 April
7.	Upto 1.5 kms a.s.l.	31 Mar	Jharkhand to north coastal Andhra Pradesh	Stationary	*In situ*	Became less marked on 1 April

TABLE 3

Details of the weather systems during April 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**) *Depression*						
1.	Depression	2-3	North Andaman Sea	North-northeast	North Andaman Seaoff south Myanmar coast near Lat. 13.2° N / Long. 97.6° E	Initially it lay as a cyclonic circulation extending up to 4.5 km above m.s.l. over southeast Bay of Bengal and neighbourhood on 29th. Details are given in the article on 'Storms and depression over north Indian ocean 2021'
(**B**) *Western disturbances / Eastward moving systems*						
(*i*) *Upper air cyclonic circulation*						
1.	At 3.1 kms above m.s.l.	7	Jammu, Kashmir & Ladakh and neighbourhood	Stationary	*In situ*	Initially it lay as a trough in mid and upper tropospheric westerlies with its axis at 3.1 km above m.s.l. ran roughly along Long. 65° E to the north of Lat. 32° N on 6. Became less marked on 8. However, trough aloft became lee marked on 10
2.	Do	19-21	North Pakistan and neighbourhood	East	Jammu-Kashmir &Ladakh and neighbourhood	Moved away east-northeastwards on 22
3.	Between 3.1 and 4.5 kms above m.s.l.	23-24	Do	Do	Northeastern parts of Ladakh and neighbourhood	With a trough aloft with its axis at 7.6 kms above m.s.l. ran roughly along Long. 72° E to the north of Lat. 28° N. WD as a cyclonic circulation moved away northeastwards on 25. However, trough moved away northeastwards on 26 morning
4.	At 3.6 kms above m.s.l.	27	Do	Stationary	*In situ*	Moved away northeastwards on 28
(*ii*) *As a trough*						
1.	Between 3.1 & 7.6 km above m.s.l.	4	Roughly along Long. of 55° E to Lat. of 32° N	Stationary	*In situ*	Then, it lay as a cyclonic circulation over north Pakistan and adjoining Jammu, Kashmir & Ladakh on 5 and moved away northeastwards on 6
2.	Between 5.8 &7.6 kms above m.s.l.	4-5	Roughly along Long. 86° E to the north of Lat. 22° N	East	Roughly along Long. 89° E to the north of Lat. 22° N	Moved away eastwards on 6
3.	At 3.1 kms above m.s.l.	6	Roughly along Long. 85° E to the north of Lat. 25° N	Stationary	*In situ*	Became less marked on 7
4.	At 2.1 km above m.s.l.	7	Roughly along Long. 85° E to the north of Lat. 22° N	Do	Do	Became less marked on 8
5.	At 1.5 kms above m.s.l.	9	Roughly along Long. 86° E to the north of Lat. 22° N	Do	Do	Became less marked on 10

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
6.	At 5.8 kms above m.s.l.	10-14	Roughly along Long. 66° E to the north of Lat. 32° N	East	Roughly along Long. 88° E to the north of Lat. 25° N	Became less marked on 15
7.	At 1.5 kms above m.s.l.	11-12	Roughly along Long. 88° E to the north of Lat. 24° N	Stationary	*In situ*	Became less marked on 13
8.	At 1.5 kms above m.s.l.	13	Sub Himalayan West Bengal & Sikkim to south Chhattisgarh across Jharkhand & interior Odisha	Do	Do	Became less marked on 14
9.	At 5.8 kms above m.s.l.	12-14 (eve)	Roughly along Long. 55° E to the north of Lat. 30° N	East	Roughly along Long. 70° E to the north of Lat. 25° N	Moved away east-northeastwards on 15
10.	At 1.5 kms above m.s.l.	16	Roughly along Long. 88° E to the north of Lat. 22° N	Stationary	*In situ*	Became less marked on 17
11.	At3.1 kms above m.s.l.	15	Roughly along Long. 65° E to the north of Lat. 20° N	Do	Do	It then lay as a cyclonic circulation over north Pakistan & neighbourhood on 16. Again, it lay as a trough in mid & upper tropospheric westerlies which ran roughly along Long. 73° E to the north of Lat. 27° Non 17 and moved away northeastwards on 19
12.	At 5.8 kms above m.s.l.	16-18	Roughly along Long. 82° E to the north of Lat. 22° N	East	Roughly along Long. 92° E to the north of Lat. 20° N	Became less marked on 19
13.	Upto 2.1 kms above m.s.l.	20	Roughly along Long. 88° E to the north of Lat. 26° N	Stationary	*In situ*	Became less marked on 21
14.	At 5.8 kms above m.s.l.	19-22	Roughly along Long. 55° E to the north of Lat. 28° N	East	Roughly along Long. 73° E to the north of Lat. 25° N	In between, it lay as a cyclonic circulation over northwest Afghanistan & neighbourhood with a trough aloft on 20. Moved away northeastwards on 23
15.	Between 3.6 & 4.5 kms above m.s.l.	28 Apr-1 May	Roughly along Long. 65° E to the north of Lat. 32° N	Do	Do	Moved away eastwards on 2 May
16.	At 5.8 kms above m.s.l.	30 Apr-3 May	Roughly along Long. 88° E to the north of Lat. 22° N	Do	Roughly along Long. 90° E to the north of Lat. 22° N	Became less marked on 4 May
17.	At 3.1 kms above m.s.l.	30 Apr-1 May	Roughly along Long. 55° E to the north of Lat. 22° N	Do	Roughly along Long. 58° E to the north of Lat. 22° N	It then lay as a cyclonic circulation over south Pakistan & neighbourhood on 2 and moved away northeastwards on 4 May
(**C**)	*As an induced cyclonic circulation*					
1.	Up to 1.5 km above m.s.l.	13-14	West Rajasthan and neighbourhood	Stationary	*In situ*	Initially, it lay as a cyclonic circulation over southwest Rajasthan & neighbourhood on 12. Again, it lay as a cyclonic circulation over Haryana & neighbourhood on 15 and merged with the induced cyclonic circulation over northwest Rajasthan & neighbourhood on 16

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.	At 1.5 km above m.s.l.	15-18	Central Pakistan and adjoining west Rajasthan	East	Punjab and neighbourhood	Became less marked on 19
3.	Upto 0.9 km above m.s.l.	19-21	North Rajasthan and neighbourhood	North	Do	Became less marked on 22
(D)	*Other upper air cyclonic circulations*					
1.	At 0.9 km above m.s.l.	1	South Assam and neighbourhood	Stationary	*In situ*	Became less marked on 2
2.	Between 1.5 & 3.6 kms above m.s.l.	1	Sri Lanka and adjoining comorin area	Do	Do	Became less marked on 2
3.	At 0.9 km above m.s.l.	2-3	West Rajasthan and neighbourhood	East	Southeast Rajasthan and neighbourhood	Became less marked on 4
4.	At 1.5 km above m.s.l.	3	Sri Lanka and neighbourhood	Stationary	*In situ*	Became less marked on 4
5.	At 2.1 km above m.s.l.	3	Andhra Pradesh coast	Do	Do	Became less marked on 4
6.	Between 2.1 & 3.6 kms above m.s.l.	3	South Maharashtra coast and neighbourhood	Do	Do	Became less marked on 4
7.	At 0.9 km above m.s.l.	3-4	Jharkhand and adjoining Gangetic West Bengal	Do	Do	Became less marked on 5
8.	Upto 0.9 km above m.s.l.	4-7	Southwest Rajasthan and neighbourhood	East	West Uttar Pradesh and neighbourhood	Became less marked on 8
9.	Upto 3.1 kms above m.s.l.	5	Bangladesh	Stationary	*In situ*	Became less marked on 6
10.	At 0.9 km above m.s.l.	5	North Tamil Nadu and neighbourhood	Do	Do	Became less marked on 6
11.	Up to 0.9 km above m.s.l.	6-12	Comorin area and neighbourhood	Oscillatory	South Tamil Nadu and neighbourhood	Became less marked on 13
12.	At 0.9 km above m.s.l.	7	Southwest Rajasthan and neighbourhood	Stationary	*In situ*	Became less marked on 8
13.	Between 0.9 and 1.5 km above m.s.l.	7	Jharkhand and adjoining north Chhattisgarh	Do	Do	Became less marked on 8
14.	Upto 1.5 kms above m.s.l.	7	South Andaman Sea and adjoining north Sumatra coast	Do	Do	Became less marked on 8
15.	Upto 1.5 kms above m.s.l.	8-10	East Uttar Pradesh and adjoining Bihar	East	Bihar and adjoining Jharkhand	Became less marked on 11
16.	Between 3.1 and 5.8 kms above m.s.l.	9-10	Southwest Bay of Bengal off Sri Lanka & Tamil Nadu coast	Stationary	Southwest Bay of Bengal and adjoining Sri Lanka off south Tamil Nadu coast	Became less marked on 11
17.	At 1.5 kms above m.s.l.	9-11	South Madhya Pradesh and neighbourhood	West	Southwest Madhya Pradesh and neighbourhood	Became less marked on 12
18.	Between 3.1 and 3.6 kms above m.s.l.	11	Southwest Bay of Bengal and adjoining south Sri Lanka	Stationary	*In situ*	Became less marked on 12

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
19.	Upto 1.5 kms above m.s.l.	12	Interior Odisha and neighbourhood	Stationary	*In situ*	Became less marked on 13
20.	Upto 0.9 km above m.s.l.	14	Northwest Madhya Pradesh and neighbourhood	Do	Do	Became less marked on 15
21.	At 1.5 kms above m.s.l.	14	Comorin area and neighbourhood	Do	Do	Became les marked on 15
22.	Upto 1.5 kms above m.s.l.	14	North Interior Karnataka and neighbourhood	Do	Do	Became less marked on 15
23.	Upto 2.1 kms above m.s.l.	15	North Gangetic West Bengal and neighbourhood	Do	Do	Became less marked on 16
24.	Between 3.1 and 5.8 kms above m.s.l.	15	Vidarbha and neighbourhood	Do	Do	Became less marked on 16
25.	Between 3.1 and 4.5 kms above m.s.l.	16	North interior Odisha	Do	Do	Became less marked on 17
26.	Upto 0.9 km above m.s.l.	16	South coastal Odisha and neighbourhood	Do	Do	Became less marked on 17
27.	Do	18	Central Assam and neighbourhood	Do	Do	Became less marked on 19
28.	At 0.9 km above m.s.l.	17-18	Kerala and neighbourhood	Do	Do	Became less marked on 19
29.	Do	17-18	East Uttar Pradesh and neighbourhood	Do	Do	Became less marked on 19
30.	Upto 2.1 kms above m.s.l.	17-18	Bihar and neighbourhood	South	Jharkhand and neighbourhood	Became less marked on 19
31.	Do	19	Southeast Madhya Pradesh and neighbourhood	Stationary	*In situ*	Became less marked on 20
32.	Between 1.5 and 2.1 kms above m.s.l.	20	Vidarbha and adjoining Marathwada	Do	Do	Became less marked on 21
33.	At 1.5 kms above m.s.l.	21-22	South Tamil Nadu and neighbourhood	Do	Do	Became less marked on 23
34.	Upto 0.9 km above m.s.l.	21-22	Southwest Rajasthan and neighbourhood	Do	Do	Became less marked on 23
35.	At 3.1 kms above m.s.l.	23	Sub Himalayan West Bengal	Do	Do	Became less marked on 24
36.	Upto 1.5 kms above m.s.l.	23	South Odisha and neighbourhood	Do	Do	Became less marked on 24
37.	Do	23	Marathwada and neighbourhood	Do	Do	Became less marked on 24
38.	Upto 0.9 km above m.s.l.	24	Southeast Rajasthan and neighbourhood	Do	Do	Became less marked on 25
39.	Between 1.5 and 2.1 kms above m.s.l.	25	Southeast Madhya Pradesh and neighbourhood	Do	Do	Became less marked on 26

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
40.	Upto 1.5 kms above m.s.l.	24-25	Southwest Uttar Pradesh and neighbourhood	East	Northeast Uttar Pradesh and neighbourhood	Initially, it lay as an induced cyclonic circulation extending upto 1.5 kms above m.s.l. over northwest Rajasthan & neighbourhood on 23. Became less marked on 26
41.	At 1.5 kms above m.s.l.	26	Northwest Rajasthan and neighbourhood	Stationary	*In situ*	Became less marked on 27
42.	At 0.9 km above m.s.l.	26	North Gujarat and neighbourhood	Do	Do	Became less marked on 27
43.	Between 1.5 and 2.1 kms above m.s.l.	26	Coastal Andhra Pradesh and neighbourhood	Do	Do	Became less marked on 27
44.	At 5.8 kms above m.s.l.	26 Apr-1 May	Southwest Rajasthan and neighbourhood	Oscillatory	South Pakistan and neighbourhood	Merged with the WD over south Pakistan & neighbourhood on 2 May
45.	Upto 0.9 km above m.s.l.	27	Gangetic West Bengal and adjoining Bangladesh	Stationary	*In situ*	Became less marked on 28
46.	Between 2.1 and 3.6 kms above m.s.l.	27Apr-2 May	Southwest Bay of Bengal off north Tamil Nadu coast	Oscillatory	Comorin area and adjoining south Tamil Nadu	Became less marked on 3 May
47.	Upto 0.9 km above m.s.l.	28	Bihar and adjoining east Uttar Pradesh	Stationary	*In situ*	Became less marked on 29
48.	Upto 1.5 kms above m.s.l.	29-30 Apr	East Madhya Pradesh and neighbourhood	East	Northeast Madhya Pradesh and neighbourhood	Became less marked on 1 May
49.	At 4.5 kms above m.s.l.	30 Apr	Meghalaya and neighbourhood	Stationary	*In situ*	Became less marked on1 May
50.	At 1.5 kms above m.s.l.	29 Apr-3 May	South Madhya Maharashtra and neighbourhood	South	North Interior Karnataka and neighbourhood	Became less marked on 4 May
51.	At 5.8 kms above m.s.l.	30 Apr-4 May	Southwest Rajasthan and neighbourhood	East	West Uttar Pradesh and neighbourhood	Became less marked on 4 May
(**E**)	*North-South troughs/Wind discontinuity/other troughs*					
1.	Upto 1.5 km above m.s.l.	2	Odisha to north interior Karnataka with an embedded cyclonic circulation over south Odisha and neighbourhood	Stationary	*In situ*	Became less marked on 3. However, embedded cyclonic circulation lay over south Chhattisgarh & neighbourhood on 3, 4 and became less marked on 5
2.	At 0.9 km above m.s.l.	4-5	North interior Karnataka to interior Tamil Nadu	Do	Telangana to the cyclonic circulation over north Tamil Nadu	Became less marked on 6
3.	Upto 0.9 km above m.s.l.	6-7	From the cyclonic circulation over Comorin area and neighbourhood to Marathwada across interior Tamil Nadu & interior Karnataka	Oscillatory	From cyclonic circulation over Comorin area and neighbourhood to north interior Karnataka	Became less marked on 8
4.	At 0.9 km above m.s.l.	8	From the cyclonic circulation over east Uttar Pradesh & adjoining Bihar to east Vidarbha across east Madhya Pradesh & Chhattisgarh	Stationary	*In situ*	Became less marked on 9

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	At 0.9 km above m.s.l.	9-10	Vidarbha to south interior Tamil Nadu across Telangana, interior Karnataka and Rayalaseema	Oscillatory	From the cyclonic circulation over southwest Madhya Pradesh and neighbourhood to the cyclonic circulation over Comorin area and neighbourhood across Marathwada, Madhya Maharashtra, Karnataka & Kerala	Became less marked on 11
6.	Do	12-13	From the cyclonic circulation over south Tamil Nadu and neighbourhood to south Konkan across Kerala & interior Karnataka	East	Off south Kerala coast to south Konkan across coastal Karnataka	It moved away northeastwards on 14
7.	Do	15	Southeast Arabian Sea off Kerala coast to north interior Karnataka across south interior Karnataka	Stationary	*In situ*	Became less marked on 16
8.	Do	17-18	Vidarbha to interior Tamil Nadu across Marathwada and interior Karnataka	Oscillatory	From the cyclonic circulation over Jharkhand & neighbourhod to north interior Karnataka across Chhattisgarh & Telangana	Became less marked on 19
9.	At 1.5 km above m.s.l.	20-28	From the cyclonic circulation over southeast Madhya Pradesh and neighbourhood to north interior Karnataka across Marathwada	Do	East Bihar to south coastal Odisha	Became less marked on 29
10.	Do	25	Jharkhand to the cyclonic circulation over southeast Madhya Pradesh and neighbourhood across north Chhattisgarh	Stationary	*In situ*	Became less marked on 26
11.	At 0.9 km above m.s.l.	27-29	North interior Karnataka to Comorin area across interior Kerala	Oscillatory	West Vidarbha to south Tamil Nadu across interior Karnataka	Became less marked on 30
12.	Do	30 Apr	Northeast Madhya Pradesh and neighbourhood to Vidarbha	Stationary	*In situ*	Became less marked on 1 May
13.	Upto 1.5 kms above m.s.l.	29 - 30 Apr	From the cyclonic circulation over east Madhya Pradesh and neighbourhood to Gangetic West Bengal	Oscillatory	From the cyclonic circulation over northeast Madhya Pradesh and neighbourhood to central parts of West Bengal across Jharkhand	Became less marked on 1 May
(F)	*Trough in easterlies*					
1.	At 1.5 kms above m.s.l.	11	North Kerala to the cyclonic circulation over Southwest Madhya Pradesh and neighbourhood across interior Karnataka & Marathwada	Stationary	*In situ*	Became less marked on 12

TABLE 4

Details of the weather systems during May 2020

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/Depression*						
1.	Extremely Severe Cyclonic Storm 'Tauktae'	14-19	Southeast Arabian Sea	Northeast	South Rajasthan and adjoining Gujarat region	Under the influence of cyclonic circulation over southeast Arabian Sea and neighbourhood, a low pressure area formed on 13. Details are given in the article on 'Storms and depression over north Indian ocean 2021'
2.	Very Severe Cyclonic Storm 'Yaas'	23-27	Eastcentral Bay of Bengal	North-northwest	South Bihar and adjoining Jharkhand	Under the influence of cyclonic circulation over southeast and adjoining central Bay of Bengal, a low-pressure area formed over eastcentral Bay of Bengal on 22. Details are given in the article on 'Storms and depression over north Indian ocean 2021'
(**B**) *Western disturbances/Eastward moving systems*						
(*i*) *Upper air cyclonic circulation*						
1.	Between 3.1 & 3.6 kms above m.s.l.	15-17	North Pakistan and neighbourhood	East	Jammu and neighbourhood	It then lay as a trough ran roughly along Long. 72º E and Lat. 28º N between 4.5 & 5.8 kms above m.s.l. on 18 and moved away east-northeastwards on 19
2.	At 5.8 kms above m.s.l.	21	North Pakistan, adjoining Jammu-Kashmir & Ladakh	Do	North Pakistan and adjoining Jammu-Kashmir	With a trough aloft at 7.6 kms above m.s.l. ran roughly along Long. 68º E and Lat. 20º N. WD as a cyclonic circulation became less marked on 22 and trough moved away northeastwards on 23
3.	Between 3.1 & 3.6 kms above m.s.l.	23-26	Do	Do	Eastern parts of Jammu-Kashmir & Ladakh and neighbourhood	With a trough aloft in mid & upper tropospheric westerlies with its axis at 5.8 kms above m.s.l. ran roughly along Long. 68º E and Lat. 25º N and became less marked on 24. Again, WD as a cyclonic circulation lay as a trough mid tropospheric westerlies with its axis at 5.8 kms above m.s.l. ran roughly along Long. 78º E and Lat. 28º N on 27 and became less marked on 28
4.	Between 1.5 & 3.1 kms above m.s.l.	27-29 May	West Afghanistan and neighbourhood	Do	North Pakistan and neighbourhood	With a trough aloft in mid & upper tropospheric westerlies with its axis at 5.8 kms above m.s.l. ran roughly along Long. 62º E and Lat. 30º N on 28. WD as a cyclonic circulation became less marked on 30. However, trough moved away east-northeastwards on 3 June
(*ii*) *As a trough*						
1.	Between 5.8 & 7.6 kms above m.s.l.	4-7	Along Long. 83° E to the north of Lat. 20° N	East	Along Long. 90° E to the north of Lat. 22° N	It moved away east-northeastwards on 8

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.	At 5.8 kms above m.s.l.	6-12	Along Long. 64° E to the north of Lat. 26° N	Stationary	Along Long. 90° E to the north of Lat. 20° N	Initially, WD lay as a cyclonic circulation over Iran and neighbourhood on 4 and east Iran and neighbourhood on 5. It became less marked on 13
3.	Between 3.1 & 3.6 kms above m.s.l.	5	Along Long. 85° E to the north of Lat. 22° N	Do	*In situ*	Merged with the trough in westerlies that ran roughly along Long.90° E to the north of Lat. 18° N on 6
4.	Do	8-9	Along Long. 85° E to the north of Lat. 22° N	East	Along Long. 92° E to the north of Lat. 27° N	It became less marked on 10
5.	Between 1.5 & 2.1 kms above m.s.l.	10	Along Long. 87° E to the north of Lat. 23° N	Stationary	*In situ*	It became less marked on 11
6.	At 5. 8 kms above m.s.l.	10-14	Along Long. 60° E to the north of Lat. 28° N	East	Along Long. 78° E to the north of Lat. 30° N	It moved away northeastwards on 15
7.	Between 1.5 & 3.1 kms above m.s.l.	14-15	Along Long. 88° E to the north of Lat. 25° N	Do	Along Long. 92° E to the north of Lat. 26° N	It became less marked on 16
8.	At 5. 8 kms above m.s.l.	17-18	Along Long. 62° E to the north of Lat. 26° N	Do	Along Long. 64° E to the north of Lat. 26° N	Initially, WD as a cyclonic circulation lay over eastern parts of Iran and neighbourhood on 16. Again, on 19, it lay as a cyclonic circulation over Jammu-Kashmir and Ladakh between 3.1 & 3.6 kms a.s.l. with the trough aloft with its axis at 5.8 kms a.s.l. running roughly along Long. 70° E to the north of Lat. 27° N on 19. WD as a cyclonic circulation became less marked on 20 and trough moved away east-northeastwards on 21
9.	Between 3.6 & 7.6 kms above m.s.l.	31 May	Along Long. 85° E to the north of Lat. 20° N	Stationary	*In situ*	It became less marked on 1 June
(**C**)	*Other upper air cyclonic circulations*					
1.	Between 3.6 & 4.5 kms above m.s.l.	1	Jammu-Kashmir & Ladakh and neighbourhood	Stationary	*In situ*	It became less marked on 2
2.	At 1.5 kms above m.s.l.	1	Bihar and neighbourhood	Do	Do	It became less marked on 2
3.	At 0.9 km above m.s.l.	2-3	Arunachal Pradesh and neighbourhood	South	Assam and neighbourhood	It became less marked on 4
4.	Between 1.5 & 5.8 kms above m.s.l.	5	Comorin area and neighbourhood	Stationary	*In situ*	It became less marked on 6
5.	At 0.9 km above m.s.l.	5-7	North interior Karnataka and neighbourhood	Do	Do	It became less marked on 8
6.	At 3.1 kms above m.s.l.	5	Haryana and neighbourhood	Do	Do	It became less marked on 6
7.	At 0.9 kms above m.s.l.	6	Southeast Arabian Sea and adjoining Maldives area	Do	Do	It became less marked on 7

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
8.	At 3.1 kms above m.s.l.	6-7	North Gujarat coast	West	Northeast Arabian Sea off Gujarat coast	It became less marked on 8
9.	Upto 1.5 kms above m.s.l.	7	Southwest Rajasthan and neighbourhood	Stationary	*In situ*	It became less marked on 8
10.	Do	6-7	Northern parts of central Madhya Pradesh	Do	Do	It became less marked on 8
11.	Between 1.5 & 2.1 kms Above m.s.l.	8	Gangetic West Bengal and adjoining Jharkhand & Bihar	Do	Do	It became less marked on 9
12.	At 0.9 kms above m.s.l.	8	East Uttar Pradesh and adjoining Bihar	Do	Do	It became less marked on 9
13.	Upto 1.5 kms above m.s.l.	8-14	West Madhya Pradesh and neighbourhood	Oscillatory	Vidarbha and neighbourhood	It became less marked on 15
14.	Do	8	South Tamil Nadu, adjoining Kerala & Comorin area	Stationary	*In situ*	Became less marked on 9
15.	Upto 0.9 kms above m.s.l.	9	South Pakistan and southwest Rajasthan	Do	Do	Became less marked on 10
16.	At 3.1 kms above m.s.l.	9-12	North Arabian Sea	Oscillatory	Southwest Rajasthan and adjoining Pakistan	Became less marked on 13
17.	Upto 3.1 kms above m.s.l.	10	Equatorial Indian ocean and adjoining central parts of south Arabian Sea	Stationary	*In situ*	Merged with the ITCZ on 11
18.	At 2.1 kms above m.s.l.	10	Jammu division and neighbourhood	Do	Do	Became less marked on 11
19.	At 0.9 kms above m.s.l.	10	Bihar and neighbourhood	Do	Do	Became less marked on 11
20.	At 1.5 kms above m.s.l.	10-12	South Tamil Nadu and neighbourhood	Oscillatory	Tamil Nadu and neighbourhood	Became less marked on 13
21.	Upto 2.1 kms above m.s.l.	11-12	Central Pakistan and adjoining west Rajasthan	East	Punjab and neighbourhood	It became less marked on 13
22.	Upto 0.9 km above m.s.l	13	Central parts of south Uttar Pradesh and neighbourhood	Stationary	*In situ*	It became less marked on 14
23.	Do	14	Gangetic West Bengal and neighbourhood	Do	Do	It became less marked on 15
24.	Upto 1.5 km above m.s.l.	13-14	Central Pakistan and neighbourhood	Do	Do	It became less marked on 15
25.	Between 3.1 & 3.6 kms above m.s.l.	15	South Pakistan and adjoining southwest Rajasthan	Do	Do	It became less marked on 16
26.	At 1.5 kms above m.s.l.	15	Central parts of Madhya Pradesh	Do	Do	It became less marked on 16
27.	Upto 1.5 kms above m.s.l.	15	Northeast Rajasthan & neighbourhood	Do	Do	It became less marked on 16
28.	Upto 0.9 kms above m.s.l.	14-16	Central parts of Assam	Do	Do	It became less marked on 17
29.	Upto 1.5 kms above m.s.l.	17	Northeast Madhya Pradesh and neighbourhood	Do	Do	It became less marked on 18

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
30.	At 3.1 kms above m.s.l.	18	Southwest Uttar Pradesh and neighbourhood	Stationary	*Insitu*	It became less marked on 19
31.	Upto 0.9 km above m.s.l.	18	Punjab and neighbourhood	Do	Do	It became less marked on 19
32.	Between 1.5 & 4.5 kms above m.s.l.	18-21	Equatorial Indian ocean and adjoining eastern parts of southeast Bay of Bengal	Do	Southeast and adjoining central Bay of Bengal	Under its influence, a low pressure area formed over eastcentral Bay of Bengal on 22
33.	At 0.9 km above m.s.l.	19	Central Assam	Do	*In situ*	It became less marked on 20
34.	Upto 2.1 kms above m.s.l.	21-22	Northwest Rajasthan and neighbourhood	East	North Rajasthan	It became less marked on 23
35.	Upto 1.5 kms above m.s.l.	22	Marathwada and neighbourhood	Stationary	*In situ*	It became less marked on 23
36.	Between 3.1 & 3.6 kms above m.s.l.	23-25	Eastcentral Arabian Sea and adjoining Maharashtra coast	Do	Do	It became less marked on 26
37.	At 0.9 km above m.s.l.	23	Southwest Rajasthan	Do	Do	It became less marked on 24
38.	Do	23	Northern parts of central Madhya Pradesh	Do	Do	It became less marked on 24
39.	Upto 3.1 kms above m.s.l.	24	South Bihar and neighbourhood	Do	Do	It became less marked on 25
40.	At 0.9 km above m.s.l.	25-26	Central Pakistan and adjoining west Rajasthan	Do	Do	It became less marked on 27
41.	At 3.1 kms above m.s.l.	26	Himachal Pradesh and neighbourhood	Do	Do	It became less marked on 27
42.	Upto 0.9 km above m.s.l.	28-30	Northwest Rajasthan and neighbourhood	North	Punjab and neighbourhood	It became less marked on 31
43.	Upto 1.5 kms above m.s.l.	29	North Andaman Sea and neighbourhood	Stationary	*In situ*	It became less marked on 30
44.	At 5.8 kms above m.s.l.	29-30	Central parts of south Arabian Sea and adjoining parts of central Arabian Sea	West	Southwest Arabian Sea	It became less marked on 31
45.	Upto 0.9 kms above m.s.l.	29	Southeast Madhya Pradesh and neighbourhood	Stationary	*In situ*	It became less marked on 30
46.	At 3.1 kms above m.s.l.	29 May - 1 Jun	Eastcentral Arabian Sea off Karnataka coast	West	East central Arabian Sea and neighbourhood	It became less marked on 2 June
47.	Between 5.8 & 7.6 kms above m.s.l.	30	Tamil Nadu and neighbourhood	Stationary	*In situ*	It became less marked on 31
48.	At 3.1 kms above m.s.l.	31 May - 1 Jun	Interior Tamil Nadu	Do	Do	It became less marked on 2 June
(D)	*East-West trough/shear zone*					
1.	At 0.9 kms above m.s.l.	9-14	From the cyclonic circulation over southwest Madhya Pradesh & neighbouhood to Sub Himalayan West Bengal & Sikkim across east Madhya Pradesh, Jharkhand and south Bihar	Oscillatory	From the cyclonic circulation over central Pakistan and neighbourhood to west Uttar Pradesh across Rajasthan	It became less marked on 15

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
2.	Between 5.8 & 7.6 kms above m.s.l.	21-22	Ran roughly along Lat. 12° N	North	Ran roughly along Lat. 14° N	It became less marked on 23
3.	At 3.1 km above m.s.l.	25-26	From eastcentral Arabian Sea to Rayalaseema around Lat. 13° N	Oscillatory	From westcentral Arabian Sea to south interior Karnataka around Lat. 13° N	It became less marked on 27
(E)	*Other troughs/Wind discontinuity*					
1.	At 0.9 km above m.s.l.	1	Sub Himalayan West Bengal & Sikkim to north interior Odisha	Stationary	*In situ*	It became less marked on 2
2.	Do	1-7	From the cyclonic circulation over southeast Rajasthan to east Madhya Pradesh	Oscillatory	From the cyclonic circulation over northern parts of central Madhya Pradesh to Assam across Jharkhand & West Bengal	Became less marked on 8
3.	Do	2	North interior Karnataka to the cyclonic circulation over Comorin area and adjoining south Tamil Nadu	Stationary	*In situ*	It became less marked on 3
4.	Do	3	South Kerala to the cyclonic circulation over north interior Karnataka and neighbourhood	Do	Do	It became less marked on 4
5.	Do	4	West Vidarbha to Kerala	Do	Do	Became less marked on 5
6.	Do	5-7	From the cyclonic circulation over north interior Karnataka and neighbourhood to South Kerala coast	Oscillatory	From the cyclonic circulation over north interior Karnataka and neighbourhood to north Kerala	Became less marked on 8
7.	Do	6-7	From the cyclonic circulation over northern parts of central Madhya Pradesh to Marathwada	Do	From the cyclonic circulation over northern parts of central Madhya Pradesh to west Vidarbha	Became less marked on 8
8.	Do	8-13	From the cyclonic circulation over west Madhya Pradesh & neighbourhood to north interior Karnataka across Vidarbha & Marathwada	Do	From the cyclonic circulation over southeast Madhya Pradesh & neighbourhood to south Tamil Nadu across Vidarbha, Telangana & Rayalaseema	Became less marked on 14
9.	Do	15	From the cyclonic circulation over northeast Rajasthan & neighbourhood to Marathwada across west Madhya Pradesh	Stationary	*In situ*	Became less marked on 16
10.	Upto 1.5 kms above m.s.l.	16	From the cyclonic circulation associated with VSCS 'Tauktae' over eastcentral Arabian Sea to west Madhya Pradesh across Konkan, Goa & Madhya Maharashtra	Do	Do	Became less marked on 17

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
11.	At 0.9 km above m.s.l.	18	North Bihar to north Chhattisgarh across Jharkhand	Stationary	*In situ*	Became less marked on 19
12.	At 3.1 kms above m.s.l.	20-21	From the cyclonic circulation associated with low pressure area over northwest Madhya Pradesh & neighbourhood to eastcentral Arabian Sea across west Madhya Pradesh, north Madhya Maharashtra & south Konkan	Oscillatory	From the cyclonic circulation over east Uttar Pradesh & neighbourhood to coastal Karnataka across east Madhya Pradesh, Madhya Maharashtra & north interior Karnataka	Became less marked on 22
13.	Upto 0.9 km above m.s.l.	21-22	Sub Himalayan West Bengal to south Odisha across Jharkhand	East	Sub Himalayan West Bengal to coastal Odisha across Jharkhand	Became less marked on 23
14.	At 0.9 km above m.s.l.	28-31 May	From the cyclonic circulation over northwest Rajasthan and neighbourhood to northeast Madhya Pradesh across northeast Rajasthan		Punjab to north Madhya Pradesh	Became less marked on 1 June
15.	Do	29	From the cyclonic circulation over southeast Madhya Pradesh and neighbourhood to south Tamil Nadu across Vidarbha, Telangana & Rayalaseema	Stationary	*In situ*	Became less marked on 30
16.	Between 1.5 & 2.1 kms above m.s.l.	29-30	From the cyclonic circulation over east Uttar Pradesh and neighbourhood to Vidarbha across east Madhya Pradesh		Southern parts of east Uttar Pradesh and neighbourhood to Vidarbha across Chhattisgarh&east Madhya Pradesh	Became less marked on 31

divisions *excess* rainfall, 6 *normal* and 4 *deficient* rainfall, no sub division observed *large deficient* or *no rainfall*. Except east and northeast India homogenous region, all the other three homogenous regions recorded more than normal seasonal rainfall.

3. Significant features during various months

3.1. *March*

3.1.1. *Weather and associated synoptic features*

The details of the weather systems during the month are summarised in Table 2 and the chief amounts of rainfall are given in Table 5.

The rainfall in the month of March was below normal at55% of LPA over the country when all the homogenous regions too recorded *deficient* rainfall. The western disturbance activity in the month of March was higher than normal but this did not cause much precipitation over the northwestern parts of the country.

3.1.2. *Temperature distribution*

(a) *Minimum temperatures*

No *Cold day* or *Cold wave* conditions were observed in this month.

The minimum temperatures over the northern parts of the country were generally *above normal* with pockets of *appreciably above normal* temperatures over Punjab, north Rajasthan and Chhattisgarh. The night temperatures were generally *normal/below normal* over south peninsular region.

TABLE 5

Some representative amounts of rainfall in cm for the months March, April and May 2020 (5 cm and above)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
1 Mar	Nil
2 Mar	Tuting 8, Sankalan 6, Anini 5
3 Mar	Nil
4 Mar	Nil
5 Mar	Nil
6 Mar	Cherrapunji 8, Mawsynram5
7 Mar	Kailashahar AP 5
8 Mar	Nil
9 Mar	Nil
10 Mar	Kokrajhar and Mylaudy 7 each, Mavelikara 5
11 Mar	Kothagiri 12, Andipatti and Sivagiri 9 each, Coonoor PTO, Pilavakkal and Coonoor 8 each, Thritla, Devakottai and Thenkasi 7 each, Majitar, Khanitar, Kabi, Vadakara, Palakkad, Ayikudi and Periakulum 5 each
12 Mar	Kupwara 7, Raj Pura ARG, Shalimar Agro and Konni 6 each, Gulmarg R.S., Coonoor PTO, Ketti and Coonoor 5 each
13 Mar	Chatra 5
14 Mar	Nil
15 Mar	Nil
16 Mar	Nil
17 Mar	Nil
18 Mar	Nil
19 Mar	Nil
20 Mar	Nil
21 Mar	Konni 5
22 Mar	Kothi 5
23 Mar	Raj Pura ARG 8, Kulgam AWS, Qazi Gund, Banihal and Govindpura AWS 5 each
24 Mar	Govindpura AWS 7, Kulgam AWS 6, Qazi Gund and Shalimar Agro 5 each
25 Mar	Nil
26 Mar	Nil
27 Mar	Nil
28 Mar	Car Nicobar Iaf 5
29 Mar	Perumpavur and Punalur 5
30 Mar	Kozha 7, Car Nicobar Iaf 6, Kamalpur and Car Nicobar 5 each
31 Mar	Tamenglongi 6, Halflong and Imphal AP 5 each
1 Apr	Khliehriat 41, Tenig Nsdma AWS 10, Itanagar 9, Halflong 8, Haflong AWS 7, Chungthang and Senapati 6 each, Naharlagun 5
2 Apr	Sankalan 16, Mangan, Singhik and Chungthang 11 each, Shipgyar 10, Halflong 8, Khliehriat, Konni, Thodupuzha, Piravam and Cherrapunji 7 each, Tuting and Anini 6 each, Cherrapunji (RKM), Haflong AWS, Mawsynram and Maya Bandar 5 each
3 Apr	Port Blair 7
4 Apr	Visakhapatnam and Kurupam 5 each
5 Apr	Nil
6 Apr	Nil

TABLE 5 (*Contd.*)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
7 Apr	Kothi 7, Qazi Gund, Raj Pura ARG and Banihal 5 each
8 Apr	Thalasserry 7
9 Apr	Neora and Damthang 6 each
10 Apr	Tuting 9, Anini and Kusmi 5 each
11 Apr	Yingkiong 16, Lamataput 8, Tuting 7, Anini 6, Palani, Periyakulam and Dhemaji 5 each
12 Apr	Mangaluru AP8, Angadipuram 7, Punalur 6, Ernakulam South and Vaikom5 each
13 Apr	Panambur 9, Virudhunagar, Aswaraopeta, Nallabelly, Ottapalam and Thiruvananthapuram 6 each, Vedasandur, Tuting, Mangaluru, Mangaluru AP and Alathur 5 each
14 Apr	Edapadi 8, Nilgiri 7, Arani, Sholayar, Yellandu and Mominpet 5 each
15 Apr	Kangeyam 11, Kodumudi 10, Bhavani 9, Kaginele ARG and Avinasi 8 each, Venkatagiri, Bhadrachalam, Nedungal, Kumarapalayam and Bodinaickanur 7 each, Palawancha, Burgampadu, T Narasipur, Williamnagar, Pallipattu, Uthukuli, Thalavadi, Kodaikanal and Erode 6 each, Kundgol, Repalle, Porumamilla, Jammalamadugu, Thottambedu, Srikalahasti, Madanapalle, Gurramkonda, Bhimadole, Mgr Nagar, Kuppady, Tiruppur, Padalur, Kashinagar, Dummagudem (ARG) , Manki, Perundurai, Aswaraopeta, Aswapuram, K. Paramathi, Hassan PTO and Manuguru 5 each
16 Apr	Kovilpatti 9, Manjalaru7, Airport Madurai and Myladumpara ARG6 each, Perundurai, Tirumangalam, Kariyapatti, Sattur and Williamnagar5 each
17 Apr	Mawsynram 12, Gangtok 9, Williamnagar, Tadong and Konni 7 each, Srivilliputhur, Virudhunagar, Port Blair, Pakyong, Ranipool and Panbari 6 each, Hogenakkal, Kulgam AWS, Madapura, Cherrapunji, Barpeta, Bahalpur, Aie Nh Xing, Manash Nh Xing, Pennagaram, Chepan, Barobhisha and Nedumangad 5 each
18 Apr	Long Island 8, Balimundali, Manali and Seo Bagh 5 each
19 Apr	Basar, Cherrapunji and Cherrapunji (RKM) 6 each, Long Island, Mathabhanga, Mangan, Silchar, Mawsynram, Gossaigaon, Chottabekra, Dharmasthala and Konni 5 each
20 Apr	Perinthalamanna 15, Angadipuram 9, Lohandiguda 8, Pechiparai and Perunchani Dam 7 each, Itanagar and Naharlagun 6 each, Erode, Chittar, Namakkal, Gangtok and Ponnani 5 each
21 Apr	Owk 8, Mathili 7, Karkala and Minicoy 6 each, Orvakal and Car Nicobar IAF 5 each
22 Apr	Minapur and Simla 8 each, Padia, Udaipur, Kothi and Sravanabelagola 7 each, Manali, Tehri, Mogullapalle and Markapur 6 each, Harangi, Murnadu, Hassan PTO, Jogindarnagar, Malkangiri, Uravakonda and Pulivendla 5 each
23 Apr	Tuting and Kayamkulam 8 each, Udaipur and Yingkiong 7 each, Ramanagara and Kotkhai 6 each, Bagdogra IAF, HMO Hansa, Kayamkulam ARG, Miryalaguda, Bhuntar AP, Manali, Palampur, Thalaguppa, Anavatti, Madapura, Manki and Tanakal 5 each
24 Apr	Magadi Agro and Bengaluru City 7 each, Dharmapuri PTO, Gannavaram AP, Santhipuram, Vijayawada AP, C N Halli, Odanchatram, Pennagaram and Dharmapuri 6 each, Bellur, Panchanahalli, Bengaluru Kial, Chaukhutia, Rasipuram, Merakamudidam, Amadagur and Vedasandur 5 each
25 Apr	Irikkur 5
26 Apr	Perinthalamanna 5
27 Apr	Paderu 5
28 Apr	Melabazar/Matunga 7, Guwahati AP, Bailhongal, Hunchadakatte and Mapusa 5 each
29 Apr	Zero 5
30 Apr	Pechiparai 6, Sulya 5
1 May	Nirmali 10, Aizawl 6, Bahadurganj, Amaur, Tiring and Eraniel 5 each
2 May	Bhagamandala 11, Gandhari 10, Pilavakkal and Watrap 7 each, Mani 6, Teligi, Armori, Shillong CSO, Ukhrukl, Khowai, Baldwara and Perumpavur 5 each
3 May	Coonoor and Coonoor PTO 11 each, Williamnagar 10, Chandikhol 9, Mudhole and Mancompu 8 each, Thenkasi, Tekulapalle, Amraghat and Kanjirappally 7 each, Jajpur, Mudholebasar and Kottayam 6 each, Kothagiri, Akhuapada, Nagapattinam, Palawancha and Chottabekra 5 each
4 May	Forbesganj 11, Khanitar 8, Jamui, Colgaon, Williamnagar, Barpeta, Jalpaiguri, Majitar, Cooch Behar, Bagdogra IAF and Bagrakote 7 each, Nedumangad, Kumargram, Chengmari/Diana, Narpatganj, Sevoke and Jashpurnagar 6 each, Pedong, Uttamapalayam, Kodumudi, Bahadurganj, Ottapalam, Pandoh, Shillong CSO, Taibpur, Dholai, Beky Rly. bridge, Vicarabad, Amaur, Dum Dum, Digha, Nagarkata, Buxaduar, Hukkeri, Gajoldoba, Bhadrak, Tihidi, Komarada and Chepan 5 each
5 May	Lawngtlai and Palasa 10 each, Kamalpur and KVK Dhalai 9 each, Mawsynram 8, Shirahatti, Suralacode and Sankarankoil 7 each, Pechiparai 6, Nargund, B Durga, Mandasa, Kanchanpur and KVK South 5 each

TABLE 5 (*Contd.*)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
6 May	Puttur HMS and Port Blair 6 each, Hadagali, Daringibadi, Narsipatnam, Pakyong, Tadong, Dhubri IMD, Mokokchang, Taliparamba and Jamui 5 each
7 May	Myladumpara ARG 8, Coonoor PTO, Bodinaickanur and Coonoor 7 each, Lamataput, Punalur and Nichlaul 6 each, Singrauli Haliyal, Dharwad PTO, Williamnagar, Deoprayag, Vellanikkara and Bhinga 5 each
8 May	Williamnagar 12, Derabis 11, Beki Mathungari 10, Bari, Berhampore, Koksara and Chandikhol 8 each, Melabazar/Matunga, Long Island, Suryagadha, Bhaghmara, Jajpur, Vaikom, Mohana, Hindol, Nedumangad, Bhagamandala, Lohandiguda and Gurur 7 each, Balod, Akhuapada, Messenjor, Agathi, Kandaghat, KVK South, Parvathipuram, Madukkur and Singrauli 6 each , Periyanaickenpalayam, Sholavandan, Barhiya, Drf, Amfu Majhian, Koraput, Marsaghai, Lakhisarai, Danagadi, Dhamnagar, M M Hills, Pharasgaon, Kondagaon, Bastar and Dharapuram 5 each
9 May	Lohandiguda 11, Kosagumda and Arcot 7, Bajag, Bastar, Manki, Kaginele ARG, Tuting, Kurudamannil, Vellanikkara, Wallajah and Sankarankoil 5 each
10 May	Narayanpur 11, Basudevpur and Soro 8 each, Kalaikunda (Iaf) , Eraniel, Tarva, Brahmagiri, Baderajpur and Agartala AP 7 each, Pipili, Mohanpur, Balasore, Rajnandgaon, Raipur, Kondagaon, Lembuchhera, Sholapur , Bemetara, Umaria- and Amarwara 6 each, Midnapore, Khowai, Haflong AWS, Majuli, Perumpavur, Vadakkancherry, Midnapore (CWC) , Motihari, Anandpur, Kharagpur (I.i.t), Araku Valley, Jhumpura, Lakhisarai, Jagatsinghpur, Yedwad, Sonhat, Rajim, Dhamdha, Berla, Kusmi, Saurbazar and Nagercoil 5 each
11 May	Kerameri 10, Katihar North and Alathur 7 each, Gundardehi 6, Baloda Bazar, Haflong AWS, Bhaghmara, Mon Sadar Nsdma AWS, Thodupuzha, Kozha, Kurudamannil and Tura 5 each
12 May	Thiruvananthapuram 16, Kayamkulam and Kayamkulam ARG 15 each, Bagrakote, Mo Salt Lake and Konni 12 each, Kanjirappally and Dum Dum 11 each, Podili, Alipore and Neyyattinkara 10 each,Barrackpur (Iaf) and Punalur 9 each, Ponnani, Varkala and Agathi 8 each, Rudravaram, Mavelikara, Trivandrum AP, Simula, Canning, Kuzhithurai, Jhanjharpur, Duvvur, Kadiri AP and Saraipali 7 each, Konakanamitla, Avanigada, Haripad, Goibargaon, Phiringia, Bejjur, Mentada, Tanuku, Tadong, Kadiri, Dornipadu, Thuckalay and Kollam Rly 6 each, Jayapura, Ramagiri, Kuppady, Madhugiri, Patnagarh, Mahasamund, Muniguda, Perunchani Dam, Kozhikode, Vaikom, Chodavaram, Thodupuzha, Veligandla, Anakapalle, Raju Palem, Drf, Parvathagiri, Khammam Urban, Denkada, Tadepalligudem, Guntakal, Berla, Berhampore, Gangtok, Koilkuntla, Allagadda and Sholavandan 5 each
13 May	Agathi 17, Haldwani 15, Dinara 10, Trivandrum AP 9, Enamakkal, Amini and Bengaluru HAL AP 8 each, Bhinga, Molakalmuru, Betanati, Baripada and Dharmsala 7 each, Singhik, Barauni, Sravanabelagola, Tarari, Kanjirappally, Rajmahal, Anandpur, Chandan, Mudubidre, Kusmi and Kaiserganj 6 each, Minicoy, Amarpur, Barur, Balrampur Teh, Balrampur, Basti Teh, Bansgaon, Gorakhpur, Bansi CWC, Elgin Bridge, Amraghat, Kochi IAF, Telkoi, Katoria, Sono, Manihari, Karkala, Sargur, Koderma, Mangan, Kannur, Sankalan, Phulberia, Banka, Uttar Kashi, Uttar Kashi (CWC) , Phangota, Cherthala and Basti 5 each
14 May	Mavelikara 15, Kayamkulam and Konni 14 each, Kayamkulam ARG 13, Agathi 12, Kuzhithurai, Neyyattinkara, Nedumangad and Kottayam 11 each, Kurudamannil, Buxaduar and Varkala 10 each, Vaikom, Kumarakam, Kozha, B P Ghat, Pechiparai, Mancompu and Haripad 9 each, Chittar, Alwaye PWD, Chalakudi, Thuckalay and Silchar 8 each, Nalbari/Pagladia, Matijuri, Thritla, Aravakurichi, Balehonnur, A P Ghat, Ernakulam South, Karimganj, Arundhutinagar, Nagercoil, Agartala AP and Kochi C.I.A.L. 7 each, Khowai, Punalur, C N Halli, Thiruvananthapuram, Kantapada, Cherthala, Williamnagar, Krishnaprasad, Peermade To, Piravam, Perunchani Dam, Alapuzha and Tuting 6 each, Suralacode, Vadakkancherry, Kodungallur, Vellanikkara, Mylaudy, Hosur, G Bazar, Kadaladi, Mudukulatur, K.paramathi, Nelamangala, Enamakkal, Koloriang, Bhadrak, Bonth, Belpada, Balikuda, Jhumpura, Gurundia, Pasighat AP, Lakhipur, Quilandi, Nongstein, Mon Sadar Nsdma AWS, Tamenglongi, Rajgarh, Kochi IAF, Aryankavu, Kanjirappally and Thandarampettai 5 each
15 May	Peermade To and Kochi IAF 21 each, Kodungallur 20, Enamakkal 19, Ernakulam South 17, Alapuzha, Kollam Rly, Kannur and Kumarakam 16 each; Irinjalakuda and Chalakudi 15 each, Ponnani, Devala, Vaikom and Pattembi 14 each, Cherthala, Kozhikode, Thritla, Mancompu and Varkala 13 each, Mavelikara, Alwaye PWD, Kayamkulam and Kayamkulam ARG 12 each, Quilandi, Perumpavur, Kochi C.I.A.L., Taliparamba, Kozha, Haripad, B P Ghat, Konni, Kurudamannil, Yingkiong, Vellanikkara, Vadakkancherry and Kottayam 11 each, Kanjirappally, Manjeri, Agathi, Sholayar, Periyar and Munnar Kseb 10 each, Thuckalay, Hosdurg, Valparai PTO, Punalur, Ottapalam, Tellichery, Perinthalamanna, Mahe and Vadakara 9 each, Vyttiri, Chittar, Nilambur, Angadipuram, Perunchani Dam, Piravam, Thekkadi, Mangaluru AP and Amini 8 each, Karipur Ap., Mangaluru, A P Ghat, Pechiparai, Suralacode, Ballarpur, Karimganj, Panambur, Thodupuzha, Neyyattinkara, Chinnakalar, Kudulu and Kuzhithurai 7 each, Mylaudy, Colachel, Valparai Taluk Office, Nedumangad, Lakhipur, Alathur, Aryankavu, Naharlagun, Trivandrum AP, Irikkur, Tuting, Thiruvananthapuram, Silchar and Mannarkkad 6 each, Idukki, Kailashahar AP, Chottabekra, N.lakhimpur/Lilabari, Nagercoil, Pasighat AP, Dhemaji, Anini, Palakkad, Beki Mathungari, Sulya, Seethanagaram, Chigurumamidy and Balod 5 each
16 May	Kollur and Mahe 24 each, Vadakara 23, Vyttiri 21, Hosanagar, Manki, Kota and Puttur HMS 19 each, Kundapur, Sholayar, Bhagamandala, Tellichery and Taliparamba 17 each, Bhatkal and Quilandi 16 each, Devala and Udupi 15 each, Ernakulam South, Kochi IAF and Dharmasthala 14 each, Irikkur, Alwaye PWD, Kalasa, Manantoddy, Kochi C.I.A.L., Virajpet and Mani 13 each, Kannur and Mulki 12 each, Piravam, Perumpavur, Mangaluru AP, Upper Bhavani, Kadra, Enamakkal, Valparai Taluk Office, Shirali PTO and Karkala 11 each, Kudulu, Mudubidre, Karwar, Chinnakalar, Karipur Ap., Thodupuzha, Valparai PTO, Panambur, Varkala and Munnar Kseb 10 each,Vaikom, Idukki, Belthangadi, Linganamakki HMS, Naduvattam, Nilambur, Neyyattinkara, Kozha, Vitla ARG, Gokarna and Honavar 9 each, Angadipuram, Perinthalamanna, Parumbikulam, Pattembi,

TABLE 5 (*Contd.*)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
	Nedumangad, Kozhikode, Irinjalakuda, Vadakkancherry, Ottapalam, Mangaluru, Sulya, Peermade To, Siddapur and Vijayapura PTO 8 each, Chittar, Mannarkkad, Beki Mathungari, Chalakudi, Perunchani Dam, Canacona, Thritla, Sagar, Ponnani, Thalaguppa, Ambalavayal, Suralacode, Myladumpara ARG, G Bazar and Thiruvananthapuram 7 each, Kuzhithurai, Kodungallur, Kuppady, Kammardi, Trivandrum AP, Kanjirappally, Quepem, Mormugao - Pmo IMD, Thuckalay, Dabolim N.a.s.- Navy, Kayamkulam, Cherthala, Alapuzha, Kumarakam and Kurudamannil 6 each, Thekkadi, Avalanche, Periyar, Kailashahar AP, Ratnagiri, Panjim, Kanyakumari, Hosdurg, Colachel, Vellanikkara, Konni, Alathur, Manjeri, Punalur, Aryankavu, Kayamkulam ARG, Itikyal, Manopad, Hasimara, Hunchadakatte, Somwarpet, Sringeri HMS, Yellapur and Shimoga 5 each
17 May	Sawantwadi 37, Ratnagiri 36, Mulde ARG and Dodamarg 25 each, Panjim 23, Malvan 21, Kudal and Devgad 20 each, Kankavli 19, Vengurla 18, Mapusa 17, Lanja 16, Vaibhavwadi and Dabolim N.a.s.- Navy 15 each, Sangameshwar Devrukh 14, Margao and Guhagarh 12 each, Kadra 11, Valparai Taluk Office and Sholayar 9 each, A P Ghat, Dapoli ARG, Harnai IMD and Mahabaleshwar 8 each, Sanguem, Quilandi, Kozhikode, Manjeri, Karipur Ap., Enamakkal, Honavar and Kollur 7 each, Vaikom, Yellapur, Vadakara, Mavelikara, Tantloi, Vyttiri, Mahe, Chinnakalar, Siddapura and Canacona 6 each, Nagarkata, Matijuri, Cooch Behar, Kurudamannil, Pattembi, Thritla, Parumbikulam, Ponnani, Vellanikkara, Siddapura ARG, KVK South, Belagavi PTO, Haliyal, Shriwardhan, Peermade To, Perumpavur, Kayamkulam ARG, Khed, Mandangad, Manchikere, Somwarpet, Karwar and Kanabargi AWS 5 each
18 May	Palghar ARG 30, Dahanu 28, Devgad and Santacruz 23 each, Bagasra, Sawantwadi and Colaba 21 each, Gir Gadhada 19, Umergam 18, Una, Talasari and Savarkundla 17 each, Palitana 16, Daman 15, Babra, Daman Fmo, Rajula, Amreli and Khambha 13 each, Alibag 12, Gadhda 11, Visavadar 10, Surat City, Umrala, Tbia IMD Part Time, Diu, Kankavli and Canacona 9 each, Khanvel, Valsad, Wada, Garhakota and Bhavnagar 8 each, Jesar, Dhari, Silvassa, Rehli, Pawai, Patharia, Damoh and Karimganj 7 each, Banera SR, Talaja, Patera, Kurwai, Dillighat, Vallabhipur, Tamenglongi, Ratnagiri and Mandal SR 6 each, Bhilwara, Shahpura, Meja, Bijaypur (adp), Neemuch Keolari, Botad, Kamrej, Nancowry, Gangtok, Kabi, Dholai, Lathi, Jafrabad, Sangameshwar Devrukh, Bhiwandi, Kalyan, Olpad and Gaya AP 5 each
19 May	Nadiad, Veja SR and Cherrapunji 23 each, Gir Gadhada 19, Una 18, Cherrapunji (RKM), Anand and Mahudha 16 each, Matar, Umergam and Daman Fmo 15 each, Kanva SR, Dungarpur Tehsil SR, Pardi, Devel SR and Daman 14 each, Karimganj, Dhambola, Sarara, Tarapur, Vaso, Kheda and Khambhat 13 each, Olpad, Mahemdavad and Khergam 12 each, Mawsynram, Sojitra, Abad City, Dhansura, Kathalal, Aspur, Jalalpor, Girva SR and Bhavnagar 11 each, Modasa, Gogunda SR, Rajula, Borsad, Kapadvanj, Navsari, Wanakbori, Virpur, Prantij and Ganeshpur SR 10 each, Meghraj, Botad, Shihor, Dungla SR, Balasinor, Vagra, Sankalan, Madhbun, Dahegam, Bayad, Hansot, Chottabekra, Singhik, Railmagra SR, Neamatighat, Valsad, Bardoli, Vadodara and Talod 9 each, Udaipur/D-aero, Dahanu, Silvassa, Kamrej, Visavadar, Silchar, Vallabhipur, Bhiloda, Himatanagar, Mangan, Palitana, Jhadol SR, Padra, Sagwara and Anklav 8 each, Badesar SR, Loharia, Vijapur, Ajmer, Mahuva, Gandevi, Palsana, Vapi, Bari-sadri, Umrala, Kaprada, Poshina, Idar, Thasra, Chikhli, Lunawada, Khanpur, Galteshwar, Nithuwa SR, Kalol (g), Dhariabad, Niwari, Salumber, Lakhipur, Nainpur, Moranhat, Dillighat, Matijuri, Sibsagar, Margherita, Dascroi, Kolaras, Tatgarh SR, Sanand, Petlad, Malpur and Danta 7 each, Pichhore, Shirali PTO, Kapasan SR, Lathi, Gegal SR, Seoni-aws, Mandla Vallabhnagar, Gonour, Chotila, Badwara, Merta City, Amet, Sausar, Bhopalsagar SR, Chuda, Daltonganj, Chungthang, Karjan, Vadali, Khanvel, Bharuch, Ankleshwer, Dhandhuka, Bavla, Sabla SR, Tizit Nsdma AWS, Dholai, Jamwaramgarh SR, Goibargaon, Dausa, Drf, Chhotisadri, Umerpada, Miao and Shipgyar 6 each, Galiakot SR, Bhim, Kotri, Sahada SR, Hazaribagh, Nathdwara, Mavli, Chikali SR, Rashmi SR, Mauranipur, Dug, Pratapgarh, Mozamabad SR, Jagpura SR, Aron, Vijaynagar SR, Gohparu, Hawai, Harinkhola, Nagarkata, Alipurduar (CWC), Alipurduar PTO, Balumath, Umaria Manpur, Pali, Beohari, Amraghat, Satna Sohawal, Unchehra, Ajaigarh, Bichhia, Chauri, Amarwara, Rajnagar, Chand, Namsai, Majuli, Pushkar SR, Halol, Pisagan SR, Rohat SR, Thangadh, Vichhiya, Lodhika, Halvad, Ranpur, Babra, Mandvi, Godhra, Tamenglongi, Satlasana, Santrampur, Neemuch Mansa, Jambuser, Netrang, Dholka, Manjeri, Tellichery and Ratnagiri 5 each
20 May	Baheri 15, Utukuru AP 13, Mulde ARG, Lodi Road, Safdarjung and Bahadurgarh 12 each, Kudal, Jaswant Nagar, Pataudi and Rewari 11 each, Gurgaon, Aya Nagar, Pattikanda, Dholpur Tehsil SR, Hapur, Sikandra Rao, Mukhlispur and Mussoorie 10 each, Kotkasim SR, Lodi Road AWS, Mukteshwar, Hawai, Kakrahi, Lakhipur, Neemkathana SR, Akbarpur, Pebbair, Chanderdeepghat, Cuddapah, Bilari, Najafgarh AWS, Gunnaur, Jansath, Delhi Univrsity Obs and Meerut 9 each, Gorakhpur, Fatehpur Tehsil, Tanda, Viratnagar SR, Baseri SR, Jamwaramgarh SR, Faridabad, Taoru, Dhansa, Narnaul, Haldwani, Gurgaon REV, Malakhera SR, Sohana, Dholla Bazar, Mangawan, Jalesar, Kalakada, Mannarkkad, Mirzapur CWC, Bijnor, Cherrapunji, Chandpur, Budhana, Varanasi/Bab AP, Budaun, Sadabad and Ramnagar 8 each, Aonla, Anupshahr, Parbatsar, Lalganj, Hathras, Meerut Teh, Moradabad, Sps Mayur Vihar, Muzaffarnagar, Chandausi, Sambhal, Bahadurpur SR, Nimarana, Baghpat, Mehdawal, Jaunpur CWC, Mirzapur Tehsil, Karwi, Musafir Khana, Pratapgarh (t), Handia, Meja, Sikar, Mozamabad SR, Aligarh, Sultanpur CWC, Bassi, Sultanpur, Rajghat (Vns CWC), Varanasi BHU, Mahwa, Dausa, Nagar SR, Shahganj, Chand, Mandya, Kusmi, Nandavaram, Barkot, Sihowal, Ater and Banbasa 7 each, Obuladevaracheruvu, Nambulipulikunta, Champawat, Tinsukia, Shahpura SR, Rishikesh, Amer SR, Roorkee, Pahari SR, Kasganj, Kotputli, Bisauli, Kaiserganj, Yemmiganur, Garud, Mau Tehsil, Birdghat, Almora, Tamenglongi, Chottabekra, Kothakota, Kibithu, Pasighat AP, Namsai, Phoolpur Alb, Patti, Beir SR, Shikohabad, Mawsynram, Behror, Didwana, Muzaffarnagar Teh, Palam, Nuh, Kishangarh, Pisagan SR, Vijayraghogarh, Mohania, Rajnagar, Panjim, Tehri, Raipurkarchuliyan, Kishngarhwas SR and Ballabgarh 6 each, Itarhi, Soraon, Morena Shirali, Kirawali, Bilaspur, Naharlagun, Gohad, Rampur Maniharan, Siswan, Khairagar, Fatehabad, Chungthang, Dinara, Yellandu, Majhgaon, Moradabad CWC, Nagina, Bhogaon, Nauganava Sadat, Vrindavan, Conch, Ghaziabad, Prayagraj Sadar, Sidhi Siddapura ARG, Manki, Thondebhavi, Sahaswan, Gudh, Hanumana, Atchampet, Nawabganj, Bareilly PBO, Panna Sardhana, Sasni, Baraut, Palamaner, Hosdurg, A P Ghat, Tirupathur, Deeg SR, Kumher SR, Mandawar, Ramgarh SR, Purola, Rajgarh, Thanagazi, Chhansa, Farukhnagar, Srinagar SR, Jhahhar, Nawa, Veeraganoor, Roshnabad, Perambalur, Glenmorgan, Kuzhithurai, Sahlawas, Punhana, Kosli, Kharkoda, Dodamarg, Sawantwadi, Kayamkulam, Enamakkal, Kurudamannil,

TABLE 5 (*Contd.*)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
	Mancompu, Nainital, Betalghat, D/Mohanbari AP, Kapkot, Chhatnag, Trimohanighat Fm, N.lakhimpur/Lilabari, Chauldhowaghat, Majbat, Muhammadbad (g), Nichlaul, Maharajganj, Hata, Palliakalan, Kottayam, Ranikhet (g), Chandauli, Fursatganj, Bari, Loharkhet, Sama, Srimadhopur, Sikar Tehsil SR, Chakrata, Dehra Dun, Sanganer Tehsil SR, Phagi, Tehri (CWC) , Jaipur Tehsil SR, Chaksu, Laksar, Sapau SR and Bansur 5 each
21 May	Banbasa 21, Utukuru AP 13, Champawat 12, Mukteshwar, Kashipur, Haldwani and Cherrapunji 11 each, Amadagur, Nichlaul, Dhaurahara, Sethiyathope and Kolar G.f. 10 each, Anini, Katerniaghat, Khatima, Pasighat AP, Pithoragarh, Nainital, Hathwa, Dinara, Cuddapah, Lohaghat, Barauli, Ranikhet (g) and Kunda 9 each, Pati, Kotdwar, Cumbum, Pauri, Srinagar, Chakia, Jalalpur, Chapra, Sahebganj, Bhinga and Thakurdwara 8 each, Kakrahi, Mahedi/Mehshi, Tehri (CWC), Baheri, Bareilly CWC, Jakholi, Suar, Pawayan, Motihari, Kessariah, Loharkhet, Kakerdarighat, Bageshwar (thmo), Najibabad, Almora, Ukhimath, Kodawanpur/C.B. II, Bestavaripeta, Arki, Penagaluru, Hasanpur and Banarpal 7 each, Singheshwar, Kanth, Tindivanam, Betalghat, Madhipura, Podili, Belsand, Meja, Chidambaram, Panruti, Muhammadi, Perungalur, Mukhlispur, Tirupattur, Bansi CWC, Pachrukhi, Bilaspur, Kailashahar AP, Mohania, Sama, Tanda, Uravakonda, Williamnagar, Mawsynram, Muzaffarpur and Barh 6 each, Umarkhand, Rajpur, Tehri, Barhampur, Itarhi, Chanderdeepghat, Basti Teh, Lucknow (hs), Minapur, Maharajganj, Basti, Taryani, Domeriaganj, Parsa, Tilhar, Churk, Rosera, Morwa/Tajpur, Salkhua, Saurbazar, Dhampur, Kibithu, Kaiserganj, Garud, Hardwar, Deoprayag, Rishikesh, Bhore, Gairsain, Vallur, Koilkuntla, Tiring, Someshwar, Lalgarh, Dwarhat, Hawai, Cherrapunji (RKM), Gopalganj, Sattenapalle, Jhumpura, Tiruvallur, Uttar Kashi (CWC), Thamaraipakkam, Poondi, Wallajah, R.s.mangalam, Roing, Halwara IAF, Uttar Kashi, Dharchula, Bhatwari, Pantnagar, Tenughat, Jamshedpur Mo, Rudraprayag, Nimdih and Jandhaha 5 each
22 May	Ranebennur HOS 14, Aswaraopeta 11, Nayakanahatty 10, Gannavaram AP, Williamnagar, Veligandla, Vijayawada AP, Long Island, Nimdih, Pallipattu and Ramgarh Bdo 9 each, Muddanur, Tezu, Mawsynram, Aswaraopet AP, Cherrapunji, Proddutur, Duvvur, Gurundia, Deogarh, Gajapathinagaram and Athgarh 7 each, Gokarna, Raiganj PTO, Port Blair, Sathupalle, Vallur, Kamalapuram, Jhargram PTO, Cherrapunji (RKM) , Rayadurg, Kambadur and Torpa 6 each, Ranchi, Ramgarh, Mahabalipuram, Devarakonda, Uthangarai, Pokhran, Kantapada, Chintalapudi, Polavaram, Lahunipara, Atmakur, Bheemavaram, Chapad, Badvel, Hubballi, Settur, Penu Konda, Nambulipulikunta, Hindupur, Brahmasamudram and Maya Bandar 5 each
23 May	Nedungal 15, Kuzhithurai 11, Long Island 10, Maya Bandar, Nedumangad and Neyyattinkara 9 each, Perunchani Dam and Thiruvananthapuram 8 each, Chittar, Roing, Mylaudy and Trivandrum AP 7 each, Pochampalli, Ramanagara, Gobichettipalayam and Punalur 6 each, Konni, Nagercoil, Kanjirappally, Pechiparai, Itikyal, Avalanche, Upper Bhavani, Sankaridurg, Shergarh, Car Nicobar Iaf and Barapani/Umro Ae 5 each
24 May	Gadag PBO 9, Port Blair 7, Jowai 6, Shirahatti, Long Island, Hut Bay, Mapusa, Chittar and Perunchani Dam 5 each
25 May	Paradeep Cwr 16, Astaranga, Kujanga, Hut Bay and Chandbali 11 each, Balikuda, Kendrapara, Rajkanika and Kakatpur 10 each, Contai, Dhamnagar, Tirtol and Tura 9 each, Betanati and Car Nicobar Iaf 8 each, Alipingal, Bari, Suri (CWC), Davangire T.o., Hetampur, Salepur, Amarpur and Bhograi 7 each, Gheropara, Tilpara Barrage, Yellapur, Sonamura, Digha, Bolagarh, Balipatna, Soro, Durgachack, Marsaghai, Basudevpur, Derabis, Binjharpur, Bhadrak and Tihidi 6 each, Kandi, Itanagar, Khowai, Lembuchhera, Burnpur, Bishalgarh, Arundhutinagar, Udaipur, Goalpara CWC, Jhanjharpur, Amfu Majhian, Banki, Sangrampur, Panchanahalli, B Durga, Nilgiri, Nh 5 Gobindpur, Kantapada, Nischintakoili, Port Blair, Niali, Jagatsinghpur, Jajpur, Garadapur, Monghyr, Nimpara, Puri and Pattamundai 5 each
26 May	Chandbali 29, Garadapur and Rajkanika 25 each, Mylaudy 24, Marsaghai and Kujanga 23 each, Tirtol and Nawana 21 each, Paradeep Cwr 20, Balikuda, Derabis, Pattamundai and Eraniel 19 each, Astaranga 18, Bhadrak, Kottaram and Trivandrum AP 17 each, Perumpavur, Soro, Dhamnagar, Kendrapara, Kanjirappally and Peermade To 16 each, Suralacode, Jagatsinghpur, Kuzhithurai, Aryankavu, Bhoothapandy, Sethiyathope and Nagercoil 15 each, Alipingal, Tihidi and Bari 14 each, Perunchani Dam, Kanyakumari, Konni, Basudevpur, Akhuapada, Nilgiri, Jajpur and Neyyattinkara 13 each, Irinjalakuda, Thiruvananthapuram, Bonth, Chandikhol and Pechiparai 12 each, Kochi C.I.A.L., Korei, Kakatpur, Varkala and Pelandurai 11 each, Kottayam, Thuckalay, Chinnakalar, Alwaye PWD and Danagadi 10 each, Jenapur, Punalur, Chittar, Periyar, Vellanikkara, Bhograi, Enamakkal, Nischintakoili and Kurudamannil 9 each, Munnar Kseb, Anandpur, Radhapuram, Colachel, Alapuzha, Papanasam, Kaptipada and Niali 8 each, Kumarakam, Balasore, Chalakudi, Salem, Vaikom, Kozha, Kohima Sadar Nsdma AWS, Mancompu, Rairangpur, Salepur, Jhumpura, Balimundali, Mahanga, Chandanpur, Betanati, Joshipur, Nh5 Gobindpur, Jaleswar, KVK South and Car Nicobar Iaf 7 each, Penucondapuram, Minicoy, Srimushnam, Agaram Seegoor, Uthangarai, Sholayar, Gingee, Mangaluru, Nedumangad, Hut Bay, Mandya PTO, Jaipur, Rajghat, Remuna, Keonjhargarh, Tiring, Tensa, Long Island, Anini, Cherthala, Ponnani and Piravam 6 each, Lembuchhera, Myladumpara ARG, Mylam AWS, Belur, Ramanagara, Gubbi, Thekkadi, Sankaridurg, Mandar, Pudukottai, Ormanjhi, Kollam Rly, Raghunathpur, Agathi, Karkala, Sukinda, Champua, Hatadihi, Idukki, Pattembi, Baripada, Valparai PTO, Valparai Taluk Office, Contai, Digha and Balipatna 5 each
27 May	Nawana 28, Joda 27, Joshipur 25, Lathikata, Jhumpura and Chaibasa 21 each, Keonjhargarh, Champua and Panposh 20 each, Basudevpur 19, Mandar 18, Karanjia and Chandikhol 17 each, Lohardaga and Ranchi 15 each, Rajgangpur, Kozhikode and Mandira Dam 14 each, Deogarh, Swam-patna and Chakradharpur 13 each, Torpa and Tiring 12 each, Kharsema, Gurundia, Konni, Kuru, Pallahara, Jamshedpur Mo, Barkote, Phulberia, Diamond Harbour, Hatadihi, Tihidi, Mangaluru, Punalur, Kusmi and Udala 11 each, Soro, Sharpada, Ghatagaon, Lahunipara, Nimdih, Bamra, Latehar and Kottayam 10 each, Jajpur, Kirmira, Laikera, Pechiparai, Mylaudy, Kayamkulam ARG, Alapuzha, Kayamkulam, Kharidwar, Gyalsing PTO, Damthang, Rongli, Darjeeling, Binjharpur, Jamshedpur, Ramgarh and Talcher 9 each, Kuchinda, Purihansa, Manatu, Chandil, Hariharganj, Hendigir, Pedong, Pakyong, Kalyani Smo, Chatra, Labpur, Kalaktang, Uluberia, Sukinda, Nedumangad and Kurudamannil 8 each, Chandrapura, Sherghati, Bomdila, Koner, Pattikanda, Kumarakam, Khanitar, Mangan, Singhik, Shilaichak, Peermade To,

TABLE 5 (*Contd.*)

Date	Some representative amounts of rainfall in cm for March 2021 (5 cm and above)
	Kansabati Dam, Bargaon, Mangalkote, Mavelikara, Danagadi, Sankalan, Rairangpur, Deogaon, Pattamundai, Jenapur, Bhadrak, Kolabira, Telkoi, Kaptipada and Kankadahad 7 each, Chauldhowaghat, Bankura (CWC), Dhamnagar, Bhuban, Bagati, Dum Dum, Durgachack, Altuma, Dentam, Tenughat, Tusuma, Garadapur, Anandpur, Bhalukpong, Rajkanika, Beki Mathungari, Cherthala, Kaniha, Islampur, Chandankiary, Perunchani Dam, Makhdumpur, Simdega, Amfu Kalimpong, Sukiapokhri, Gangtok, Hazaribagh, Barhi, Banaigarh, Parjang and Suralacode 6 each, Mancompu, Jharsuguda, Tekari, Mulki, Piravam, Kottaram, Nagercoil, Aryankavu, Perinthalamanna, Jashpurnagar, Vaishali, Chittar, Kanjirappally, Kamakhyanagar, Bihar Shrif, Mannarkkad, Sambalpur, Harichandanpur, Bokaro, Majitar, Jamankira, Ramgarh Bdo, Bodh Gaya, Bishrampur, Daltonganj, Samakhunta, Sundargarh, Pamidi, Kurdeg, Aurangabad, Angul, Kalimpong, Ranipool, Panbari, Chendipada, Banarpal, Putki, Bankura, Burdwan PTO, Alipore, Daitari, Naktideul, Simula, Tuting, Barpeta, Beky Rly.bridge, Hazuah and Barhampur 5 each
28 May	Malda 31, Manihari 25, Kadwa 24, Barari and Rajmahal 23 each, Purnea 21, Parsa and Katihar North 18 each, Amaur 16, Banmankhi, Arwal and Sheikhpura 15 each, Rupauli, Vaishali, Murliganj and Saraiya 14 each, Ghosi, Siswan, Umarkhand, Madhipura, Debagram, Chanderdeepghat, Chapra and Jamui 13 each, Koilwar, Mahua, Hisua, Islampur, Gaya AP, Harnaut and Barrackpur (Iaf) 12 each, Sandesh, Nawada, Narhat, Ekangersarai, Koner, Tilaiya, Darjeeling, Singheshwar, Sukiapokhri, Lakhisarai, Sherghati and Bodh Gaya 11 each, Koderma, Kursela, Durgachack, Rajgir, Gaighat (Bla Fmo), Udai Kishanganj, Chand, Barh, Harihargan j, Amtala, Pachrukhi, Balrampur and Marhaura/Amnaur 10 each, Patna Aerodrome, Goraul/Doli, Jandhaha, Matihani, Bihta, Barauni, Dinara, Patahi, Jalalpur, Hazaribagh, Saurbazar, Alipore, Charpokhari, Barahara, Dum Dum, Halsi and Morwa/Tajpur 9 each, Mo Salt Lake, Kako, Narpatganj, Colgaon, Gyalsing PTO, Damthang, Hathwa, Barhiya, Kalyani Smo, Diamond Harbour and Bihar Shrif 8 each, Suryagadha, Araria, Ballia, Nalhati, Hut Bay, Hussainganj, Chandan, Bagaha, Bagati, Tenughat, Ayodhya, Marsrakh, Barauli, Tarari, Tekari, Rajauli, Bikram, Adhwara, Bhore, Khagadia, Sangrampur, Mushari, Simrii, Makhdumpur and Jahanabad 7 each, Daltonganj, Siddhpur, Chakia, Bhabhua, Parsabad, Kessariah, Ramgarh Bdo, Dhengbridge, Phulparas, Jhanjharpur, Barhi, Pathargama, Sikti, Minapur, Jokihat, Dhaurahara, Gopalganj, Dentam, Forbesganj, Kishanganj, Sasaram, Jangipur, Kataiya, Aryari, Sonbarsa, Chenari, Maharajganj, Bansi Tehsil, Mehdawal, Rafiganj, Sahebganj, Bari-sadri and Daudnagar 6 each, Krishnanagar, Mahedi/Mehshi, Hasanpur, Akbarpur, Domeriaganj, Dehri, Buxar, Uluberia, Varanasi BHU, Rajghat (Vns CWC), Uska Bazar Fm, Bansi CWC, Chandauli, Trimohanighat Fm, Pharenda, Nichlaul, Hata, Gorakhpur, Birdghat, Mohammedabad (Y), Contai, Gangtok, Bahadurganj, Bhimnagar, Shilaichak, Chatra, Sirsi Agro, Chitrangi, Chanpatia, Barhampur, Kodawanpur/C.B. II, Darauli, Satgaon, Belhar, Chewara, Barbigha, Maheshi, Salkhua, Nauihatta, Cheria B.pur 1, Rosera, Hendigir, Dharahara, Sankalan, Khanitar, Shipgyar, Mangan, Thakurganj, Ranipool, Tadong, Pakyong, Majitar, Sirmari B.pur, Kuru, Kalimpong, Bihpur, Jainagar, Samastipur, Kuratha, Manatu, Ramgarh, Madhwapur and Palmerganj 5 each
29 May	Tribeni/Balmikinagar and Bansi Tehsil 21 each, Nichlaul 19, Darbhanga 18, Nautanwa, Bagaha and Basua 17 each, Kadwa 16, Maharajganj, Hayaghat and Trimohanighat Fm 15 each, Kakrahi and Pharenda 14 each, Kodawanpur/C.B. II, Gaunaha and Mushari 13 each, Goraul/Doli, Rosera and Muzaffarpur 12 each, Chanderdeepghat, Mangaluru, Balrampur Teh, Barh and Jaley 11 each, Saraiya, Balrampur, Panambur, Sonbarsa and Bairgania 10 each, Mulki, Matihani, Supaul, Jandhaha, Uska Bazar Fm, Tulsipur, Saurbazar, Sheikhpura, Madhwapur, Tarapur, Bansi CWC, Jhanjharpur, Jainagar, Umarkhand, Minapur, Bahadurganj and Kishanganj 9 each, Barauni, Alipurduar PTO, Alipurduar (CWC), Nirmali, Gorakhpur, Dhengbridge, Sangrampur, Belsand, Thakurganj, Madhipura, Samastipur, Purnea and Morwa/Tajpur 8 each, Patahi, Ramnagar, Cheria B. pur 1, Harnaut, Birdghat, Nauihatta, Domeriaganj, Shoharatgarh, Siswan, Vaishali, Parbatta, Barbigha and Aryari 7 each, Salempur, Ayodhya, Mawsynram, Loharkhet, Gonda CWC, Gonda Sadar, Kudulu, Kumarakam, Bhanpur, Sikti, Sahebganj, Murliganj, Pusa, Chanpatia, Chakia, Mahua, Sheohar, Taryani, Sursand and Phulparas 6 each, Dharahara, Mukhlispur, Hata, Singheshwar, Nargund, Khagadia, Amaur, Ghanghata, Bhinga, Katihar North, Barari, Mahedi/Mehshi, Kessariah, Bihpur, Sahebpur Kanal, Gogri, Dumri, Maheshi, Kayamkulam ARG, Kundapur, Kabi, Williamnagar, Margherita, Mokokchang, Belhar, Kayamkulam, Alapuzha, Hasanpur, Irikkur, Pachrukhi, Bhimnagar, Tanda, Kaiserganj, Basti Teh, Deoria, Karwar and Basti 5 each
30 May	Forbesganj 12, Pharenda, M M Hills and Sama 9 each, Narpatganj and Bhalukpong 8 each, Cherthala, Nauihatta and Dharmsala 7 each, Narayanpet, Junnar and Dharmshala AWS 6 each, Dharchula, Nautanwa, Sangod, Puttur HMS, Rajgir, Bhimnagar, Williamnagar, Kondapak, Tadwai, Buxaduar, Srungavarapukota and Saiha 5 each
31 May	Williamnagar 33, Jamshedpur Mo 17, Jamshedpur 15, Bhalukpong 13, N. Lakhimpur/Lilabari 11, Tikrikilla, Srinivasapura and Dhemaji 9 each, Dharmasthala, Cherrapunji (RKM), Vellore, Gudiyatham, Melalathur, Polur, Uthiramerur, Matheran, Nongstein, Kokrajhar, Mawsynram, Manash Nh Xing and Itanagar 7 each, Bahadurganj, Cherrapunji, Virinjipuram AWS, Amfu Pundibari, Sri Niketan and Naharlagun 6 each, Midnapore, Labpur, Raiganj PTO, Puthimari, Barpalli, Katpadi, Umarkhand, Arera Hills M.c. and Karwar 5 each

The months and the season's lowest minimum temperature over the plains was 5.4 °C at Udaipur (east Rajasthan) on 2nd March, 2021.

(b) *Maximum temperatures*

Isolated *severe heat wave/heat wave* conditions were observed over Gangetic west Bengal, Odisha, Jharkhand, Vidarbha, Himachal Pradesh, coastal Andhra Pradesh & Yanam, Tamil Nadu, Puducherry & Karaikal, west Uttar Pradesh, Madhya Pradesh, Gujarat region, Rajasthan, Saurashtra & Kutch and Konkan & Goa in the second fortnight of the month.

The maximum temperatures were generally *above normal and appreciably above normal* over most sub-divisions in north India. Some of the stations of north and central India received record highest maximum

temperatures. A list of stations is furnished below with their previous record and date.

Station name	*Previous record (°C)*	*Date of record (March)*	*Year of record*	*New record (°C)*	*Date March 2021*
Balasore	41.6	29	1968	43.0	31
Bhubaneshwar AP	42.0	18	2004	44.2	31
Chandbali	41.7	22	2010	42.6	31
Ranchi AP	39.0	24.0	2004	39.2	30
Churu	42.5	30	1999	43.3	29
Kota AP	42.7	30	2003	42.8	29
Bhopal AP	40.7	29	1996	41.0	29
Chennai AP	40.6	29	1953	41.3	30
Karaikal	37.2	28	2001	37.5	31
Salem	41.7	26	1892	42.8	31
Medikeri	34.2	27	1992	35.5	28, 29, 30 & 31

Source : IMD Climate Diagnostics Bulletin of India, March 2021

The month's highest maximum temperature recorded over the plains was 44.6° C at Baripada (Odisha) on 30th March, 2021.

3.1.3. *Disastrous weather events and damage*

As per media reports heavy rain led to damage of crops and property from Ahmednagar, Akola, Aurangabad, Buldhana, Jalna, Kolhapur, Nanded, Nashik, Parbhani, Washim districts of Maharashtra. Hailstorm, damaged crops in Aurangabad, Beed, Jalna, Parbhani and Pune districts of Maharashtra and from Kota district of Rajasthan. In the last week of the month gale reportedly caused damage to the government school and residencies in Anantnag and Baramulla districts of Jammu-Kashmir and Ladakh. Floods and heavy rain killed one person from Udhampur district of Jammu-Kashmir and Ladakh. Flash flood damaged a bridge which connected over 50 villages of Lolab to district headquarters Kupwara district of Jammu-Kashmir and Ladakh. Incessant rains caused flashfloods in several areas of north Kashmir's Kupwara district that damaged a pillar of an old bridge at Badi Bera area of Lolab that connected over 50 villages of Lolab to district headquarters.

3.2. *April*

3.2.1. *Weather and associated synoptic features*

The details of the weather systems during the month are given in Table 3 and the principal amounts of rainfall are given in Table 5.

The monthly rainfall over the country was 79% of LPA with 15 sub-divisions (51% area of the country) *deficient/large deficient*, 6 sub-divisions recorded *normal* and *excess* rainfall each, 9 sub-divisions observed *large excess* rainfall while no sub-division was *dry*.

The homogenous regions of northwest (93% of LPA) and central India (104% of LPA) recorded *normal* rainfall, east and northeast India (52% of LPA) rainfall was *deficient* while south peninsular region (129% of LPA) recorded *excess* rainfall.

The first intense cyclonic disturbance of the year 2021, a depression over north Andaman sea (2-3 April) caused light to moderate rainfall at most places with heavy falls at isolated places over Andaman islands.

Under the influence of troughs/wind discontinuities and cyclonic circulations in the lower tropospheric levels, scattered to fairly widespread rainfall/thunderstorms along with isolated heavy to very heavy rainfall activity occurred over parts of peninsular India, adjoining areas of central and west India. The passage of western disturbances in quick succession during the second fortnight of the month caused fairly widespread to widespread rainfall/snowfall/thunderstorms over Himachal Pradesh, Jammu-Kashmir and Ladakh on many days and scattered to fairly widespread rainfall/ thunderstorms over remaining parts of western Himalayan region on some days. The remnants of western disturbances and cyclonic circulations in the lower tropospheric levels triggered, scattered to fairly widespread rainfall/thunderstorm activity over parts of northeast India and adjoining areas of east India.

3.2.2. *Temperature distribution*

(a) *Minimum temperatures*

The minimum temperatures over India were generally *normal*with below normal temperatures over western parts of Jammu-Kashmir and Ladakh, parts of Uttar Pradesh, east Rajasthan and Chhattisgarh.

(b) *Maximum temperatures*

Severe heat wave conditions were observed for one day over coastal Andhra Pradesh & Yanam and Tamil Nadu, Puducherry & Karaikal in the first week of the month.

Heat wave conditions in April were infrequent and observed for short durations over very small pockets. They were observed over Madhya Pradesh, Uttar Pradesh, Tamil Nadu, Puducherry & Karaikal, Telangana, Rayalaseema, coastal Andhra Pradesh, Gangetic West Bengal, Odisha, Rajasthan, Haryana, Chandigarh, Delhi and Saurashtra & Kutch.

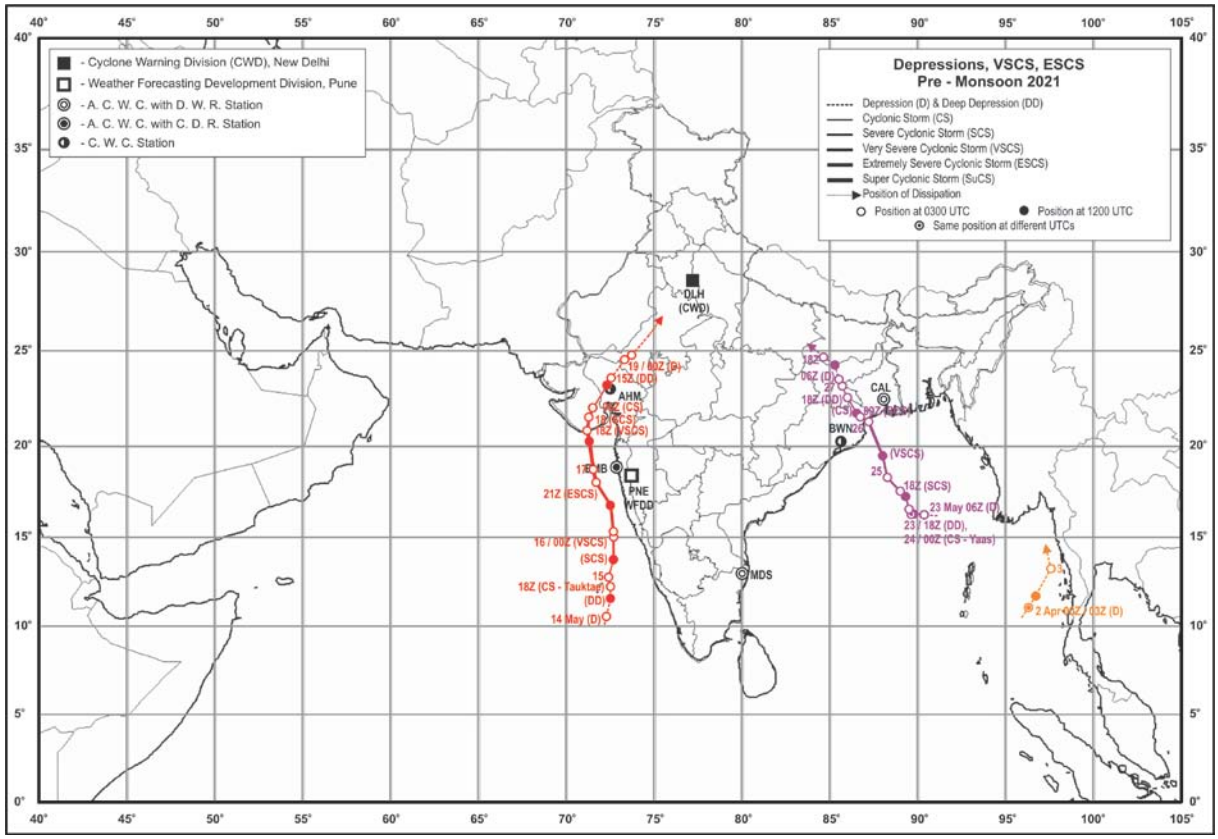

Fig. 2. Track of cyclonic storm, deep depression and depression during pre-monsoon season 2021

The maximum temperatures were generally normal over the country except northeast India where they were *appreciably above normal*. Reduced rainfall activity in this region led the day temperatures to remain *above normal*.

The highest maximum temperature recorded during the week was 45.2°C at Banda (east Uttar Pradesh) on 28th April over the plains of the country.

3.2.3. *Disastrous weather events*

In the first fortnight of the month as per media reports, rain, hailstorms and gusty winds associated with thunderstorms caused heavy damage during harvesting of *rabi* crops, *viz*., wheat, jowar, maize, onion, turmeric etc. and fruit crops like mango, cashew, grapes etc. in 9 districts of Maharashtra resulting in moderate damage to standing crops. Hailstorms also caused damage to crops and property in Yadgir district of Karnataka and completely damaged more than 10,000 saplings of strawberries in Pakyong sub-division of east Sikkim. A farmer and two girls died in Maharashtra and one in Kerala while a cow perished in Yadgir district of Karnataka due to lightning strikes.

An avalanche in the Chamoli district of Uttarakhand on 23rd April over the Sumna-Rimkhim road, a strategic road leading to the Sino-Indian border, devastated two labour camps of the border roads organization (BRO) reportedly killing 12 people. Thunderstorm with hail caused damage to fruit crops including mango fruits in Aurangabad, Hingoli and Jalna of Maharashtra in the last week of the month.

3.3. *May*

3.3.1. *Weather and associated synoptic features*

(a) *Advance of southwest monsoon*

In view of strengthening of south westerlies in the lower tropospheric levels, fairly widespread to widespread rainfall activity and persistent cloudiness over the area, southwest monsoon had advanced into some parts of south Bay of Bengal, Nicobar islands, entire south Andaman

TABLE 6

Dates of occurrence of Heat wave/Severe Heat wave and various categories of maximum temperatures - March 2021

S. No.	Sub-Division	Dates (Number of Days)	
		Severe Heat Wave	Heat Wave
1.	A. & N. Islands	-	-
2.	Arunachal Pradesh	-	-
3.	Assam & Meghalaya	-	-
4.	Naga, Mani, Mizo and Tripura	-	-
5.	S. H. W. B. & Sikkim	-	-
6.	Gangetic West Bengal	31 (1)	30 & 31 (2)
7.	Odisha	31 (1)	30 & 31 (2)
8.	Jharkhand	-	30
9.	Bihar	-	-
10.	East Uttar Pradesh	-	-
11.	West Uttar Pradesh	-	30 (1)
12.	Uttarakhand	-	-
13.	Haryana, Chandigarh & Delhi	-	-
14.	Punjab	-	-
15.	Himachal Pradesh	-	29 & 30 (2)
16.	Jammu - Kashmir and Ladakh	-	-
17.	West Rajasthan	28, 29 & 30 (3)	28, 29 & 30 (3)
18.	East Rajasthan	29 (1)	29 & 30 (2)
19.	West Madhya Pradesh	-	30 (1)
20.	East Madhya Pradesh	-	30 (1)
21.	Gujarat Region	-	28 (1)
22.	Saurashtra & Kutch	17, 25 & 26 (3)	16, 17, 25, 26, 27 & 28 (6)
23.	Konkan & Goa	25 & 26 (2)	24, 25, 26 & 27 (4)
24.	Madhya Maharashtra	-	-
25.	Marathwada	-	-
26.	Vidarbha	-	30 (1)
27.	Chhattisgarh	-	-
28.	Coastal Andhra Pradesh& Yanam	31 (1)	31 (1)
29.	Telangana	-	-
30.	Rayalaseema	-	31 (1)
31.	Tamil Nadu, Puducherry& Karaikal	31 (1)	-
32.	Coastal Karnataka	-	-
33.	North Interior Karnataka	-	-
34.	South Interior Karnataka	-	-
35.	Kerala	-	-

TABLE 7

Dates of occurrence of Heat wave/Severe Heat wave and various categories of maximum temperatures - April 2021

S. No.	Sub-division	Dates (Number of Days)	
		Severe Heat Wave	Heat Wave
1.	A. & N. Islands	-	-
2.	Arunachal Pradesh	-	-
3.	Assam & Meghalaya	-	-
4.	Naga, Mani, Mizo and Tri.	-	-
5.	S. H. W. B. & Sikkim	-	-
6.	Gangetic West Bengal	-	24, 25, 26 & 27 (4)
7.	Odisha	-	25, 26 & 27 (3)
8.	Jharkhand	-	-
9.	Bihar	-	-
10.	East Uttar Pradesh	-	6 (1)
11.	West Uttar Pradesh	-	5 & 6 (2)
12.	Uttarakhand	-	-
13.	Haryana, Chandigarh & Delhi	-	14 & 15 (2)
14.	Punjab	-	-
15.	Himachal Pradesh	-	-
16.	Jammu - Kashmir and Ladakh	-	-
17.	West Rajasthan	-	4, 5 & 6 (3)
18.	East Rajasthan	-	5 & 6 (2)
19.	West Madhya Pradesh	-	5 & 6 (2)
20.	East Madhya Pradesh	-	6 (1)
21.	Gujarat Region	-	-
22.	Saurashtra & Kutch	-	11, 12, 13, 14, 25 & 26 (6)
23.	Konkan & Goa	-	-
24.	Madhya Maharashtra	-	-
25.	Marathwada	-	-
26.	Vidarbha	-	5 & 6 (2)
27.	Chhattisgarh	-	-
28.	Coastal Andhra Pradesh& Yanam	2 (1)	2 (1)
29.	Telangana	-	2 (1)
30.	Rayalaseema	-	2 (1)
31.	Tamil Nadu, Puducherry& Karaikal	2 (1)	2 & 3 (2)
32.	Coastal Karnataka	-	-
33.	North Interior Karnataka	-	-
34.	South Interior Karnataka	-	-
35.	Kerala	-	-

TABLE 8

Dates of occurrence of Heat wave/Severe Heat wave and various categories of maximum temperatures - May 2021

S. No.	Sub-Division	Dates (Number of Days)	
		Severe Heat Wave	Heat Wave
1.	A. & N. Islands	-	-
2.	Arunachal Pradesh	-	-
3.	Assam & Meghalaya	-	29 (1)
4.	Naga, Mani, Mizo and Tri.	-	-
5.	S. H. W. B. & Sikkim	-	-
6.	Gangetic West Bengal	-	26, 27 & 30 (3)
7.	Odisha	-	28, 29 & 30 (3)
8.	Jharkhand	-	-
9.	Bihar	-	-
10.	East Uttar Pradesh	-	-
11.	West Uttar Pradesh	-	-
12.	Uttarakhand	-	-
13.	Haryana, Chandigarh & Delhi	-	-
14.	Punjab	-	-
15.	Himachal Pradesh	-	-
16.	Jammu - Kashmir and Ladakh	-	30 (1)
17.	West Rajasthan	-	30 (1)
18.	East Rajasthan	-	-
19.	West Madhya Pradesh	-	-
20.	East Madhya Pradesh	-	-
21.	Gujarat Region	-	-
22.	Saurashtra & Kutch	-	-
23.	Konkan & Goa	-	-
24.	Madhya Maharashtra	-	30 (1)
25.	Marathwada	-	-
26.	Vidarbha	-	-
27.	Chhattisgarh	-	-
28.	Coastal Andhra Pradesh	-	-
29.	Telangana	-	-
30.	Rayalaseema	-	-
31.	Tamil Nadu, Pudcherry & Karaikal	-	-
32.	Coastal Karnataka	-	30 (1)
33.	North Interior Karnataka	-	28 & 29 (2)
34.	South Interior Karnataka	-	-
35.	Kerala	-	-

Sea Sea and some parts of north Andaman Sea on 21st May. It reached Kerala on 3rd June, two days behind the schedule.

(b) *Other synoptic features and rainfall*

The details of weather systems and its track during the month are given in Table 4 and Fig. 2. The principal amounts of rainfall are given in Table 5.

Formation, intensification and movement of the two cyclones ESCS "TAUKTAE" over the Arabian Sea (14-19 May) and VSCS "YAAS" over Bay of Bengal (23-27 May) affected both the western and eastern coasts, respectively. These systems caused immense rainfall, moisture incursion, further enhancing the convectin and rainfall activities during post cyclone period over northwestern, north and eastern parts of India.

ESCS "TAUKTAE" over the Arabian Sea, moved parallel to west coast, which caused heavy to extremely heavy rainfall activity, strong wind and tidal waves affecting the west coastal states of the country. Its remnant also impacted northwest India with heavy to very heavy rainfall activity at isolated places over Rajasthan, Haryana, Chandigarh, Delhi, Uttar Pradesh and Uttarakhand on 19th May. VSCS "YAAS" over the Bay of Bengal (23-28 May) caused adverse weather over Andaman, Nicobar Islands, Odisha, West Bengal, Jharkhand, Bihar and East Uttar Pradesh.

Due to presence of lower-level wind convergence on many days in the month, Maharashtra and adjoining parts of peninsular India, experienced rainfall and thunderstorm activities at regular intervals. The passage of western disturbances in succession, the influence of remnants of western disturbances, troughs / cyclonic circulations in the lower tropospheric levels and east-west trough from northwest to northeast India across eastern India and two cyclones in the second half of the month brought record-breaking rains to many parts of India. All this led to the monthly rainfall of May being 174% of its LPA, the second highest since 1901 after the year 1990 and thus many stations registered 24-hour rainfall breaking their previous record as shown in the table below:

S. No.	*Station name*	*Previous record (mm)*	*Day*	*Year*	*New record (mm)*	*Date May 2021*
1.	Malda	195.1	30	1938	309.3	28
2.	Keonjargarh	99.9	16	1995	196.8	27
3.	Sundargarh	44.6	4	1990	49.0	27
4.	Daltonganj	62.2	27	1904	62.5	28
5.	Ranchi AP	104.6	17	1914	151.0	27
6.	Jamshedpur AP	71.9	21	1949	147.4	31
7.	Darbhanga	98.4	16	1976	183.6	29
8.	Gaya AP	65.0	29	1963	120.0	28
9.	Varanasi city	51.6	23	1889	69.8	20
10.	Varanasi AP	55.5	2	1969	82.8	20
11.	Sultanpur	70.5	25	1970	73.4	20
12.	Meerut	64.3	29	1886	85.9	20
13.	Muzaffarnagar	53.8	24	2004	69.0	20
14.	Mukteshwar	71.4	10	1916	113.2	21
15.	Tehri	52.3	20	1957	52.5	21
16.	Phoolbagh	43.4	31	2000	52.5	21
17.	Pant Nagar	5.1	14	1967	52.5	21
18.	N. Delhi	60.0	24	1976	119.3	20
19.	Ajmer	60.6	18	2006	75.1	19
20.	Udaipur	54.4	23	1977	76.1	19
21.	Datia	23.2	6	1981	33.4	19
22.	Nimach	49.3	26	1883	50.0	18
23.	Ujjain	24.8	23	1977	42.0	29
24.	Damoh	28.4	20	2000	67.0	18
25.	Mandla	33.4	31	2001	58.0	19
26.	Panna	27.4	16	2006	48.1	20
27.	Khajuraho	41.1	17	2007	43.0	20
28.	Baroda City	52.6	29	1956	85.4	19
29.	Surat	51.6	26	1974	92.5	18
30.	Bhaunagar	87.4	18	1933	110.4	19
31.	Mumbai (Colaba)	128.0	31	2006	207.6	18
32.	Alibag	146.7	15	1993	159.0	18
33.	Devgarh	201.2	31	2006	226.0	18
34.	Dahanu	105.0	28	1990	282.6	18
35.	Mumbai (SCZ)	190.8	19	2000	230.3	18
36.	Jalgaon	39.6	18	1933	56.0	30
37.	Gadag	81.8	21	1943	92.4	24
38.	Cial Cochi	117.6	19	2006	131.7	16

Source : IMD Climate Diagnostics Bulletin of India May 2021

3.3.2. *Temperature distribution*

No Significant *heat wave* occurred during the month over the country except northwest Rajasthan, where it was observed for 2 days on 29 and 30 May, 2021. The day temperatures were generally *below normal* over the country with *appreciably below normal* temperatures over northwest India.

The month's as well as the season's highest maximum temperature was 47.3 °C at Ganganagar (west Rajasthan) on 28th May over the plains of the country.

Disastrous weather events and damage

As per media reports, in this month, lightning strike took a toll of twenty people along with several livestock in Marathwada, Maharashtra and one person from Odisha. In addition to it lightning also killed 18 elephants in Nagaon forest area of Assam. Rain and hail associated with thunderstorms caused damage to onion, groundnut, vegetable crops, mangoes in Beed, Hingoli, Latur, Osmanabad and Parbhani districts of Maharashtra. Dust storm related incidences like wall collapse, uprooting of trees caused death of 5 persons in Hardoi district of Uttar Pradesh. Heavy rain accompanied by fierce winds and high tidal waves in association with ESCS "Tauktae" wreaked havoc across entire west coast states, union territories and Lakshadweep which took toll of 10 in Kerala, 8 in Karnataka, 3 in Goa, 85 in Maharashtra including 66 employees of Oil and Natural Gas Corporation (ONGC) and 79 in Gujarat. In all 251 killed and at least 80 injured during 16th to 19th May. It also caused damage to 56,846 houses, 196 roads, uprooted more than 40,000 trees and 69,429 electric poles while thousands of hectares of farmland along with various crops, *viz.*, banana, sugarcane, mangoes, coconut and vegetables etc. were heavily damaged and many low-lying areas were submerged all across the states of west coast. Also 18 lions from Gir went missing as the cyclone hit Gujarat coast on 17th. Cyclone 'YAAS' devastated coastal districts of Bengal and Odisha and after the cyclone entered Jharkhand as a deep depression and advanced towards Bihar it left a trail of destruction. Media reports mention that 4 human lives were lost, more than 1.5 million people were evacuated, at least one crore people were affected, three lakh houses and 134 embankments damaged. The period of landfall coincided with the full moon thus the impact of the storm was aggravated, high spring tides created a strong storm surge that was over and above the astronomical tide (spring tide) leading to additional damage. The tall tidal waves breached embankments and flooded villages rendering the ground water unfit for drinking and the saline water affected the agricultural lands also.

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Appendix

Definitions of the terms given in '*Italics*'

Temperatures

Heat Wave	Heat wave is considered if maximum temperature of a station reaches at least 40 °C or more for Plains and at least 30 °C or more for Hilly regions.

(a) *Based on Departure from Normal*

Heat Wave	- Departure from normal is 4.5 °C to 6.4 °C
Severe Heat Wave	- Departure from normal is >6.4 °C

(b) *Based on Actual Maximum Temperature*

Heat Wave	- When actual maximum temperature ≥ 45 °C
Severe Heat Wave	- When actual maximum temperature ≥ 47 °C

(c) *Criteria for describing Heat Wave for coastal stations*

When maximum temperature departure is 4.5 °C or more from normal, Heat Wave may be described provided actual maximum temperature is 37 °C or more.

Temperature

(a) *Maximum/day temperatures*

Markedly above normal	- 5.0 °C or more
Appreciably above normal	- 3.1 °C to 5.0 °C
Above normal	- 1.6 °C to 3.0 °C
Normal	- 1.5 °C to –1.5 °C

(b) 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.

Rainfall

Heavy	- 64.5 to 115.5 mm
Very Heavy	- 115.6 to 204.4 mm
Large Excess	- Percentage departure from normal rainfall is + 60% or more
Excess	- Percentage departure from normal rainfall is + 20% to +59%
Normal	- Percentage departure from normal rainfall is +19% to –19%
Deficient	- Percentage departure from normal rainfall is –20% to –59%
Large Deficient	- Percentage departure from normal rainfall is –60% or less
No rain	- –100%