

Weather in India

HOT WEATHER SEASON (March-May 2013)†

1. Chief features

(i) The hot weather season of 2013 witnessed formation of one Cyclonic Storm ‘Viyaru’ (10-16 May) and a Depression (29-31 May) over the Bay of Bengal.

(ii) The *heat wave conditions** were not persistently present during March and April. The *heat wave conditions* manifested from the first week of May over central India and gradually extended to most parts of the country during the last week of May. The severity of heating was such that it claimed around 440 human lives in Andhra Pradesh itself.

(iii) Rainfall for May had been normal while March *i.e.*, deficient and April remained below normal. Hence, the all India rainfall deficiency with respect to Long Period Average (LPA) for the season had been – 21%.

(iv) Southwest Monsoon advanced over the southeast Bay of Bengal and Andaman Sea on 17 May.

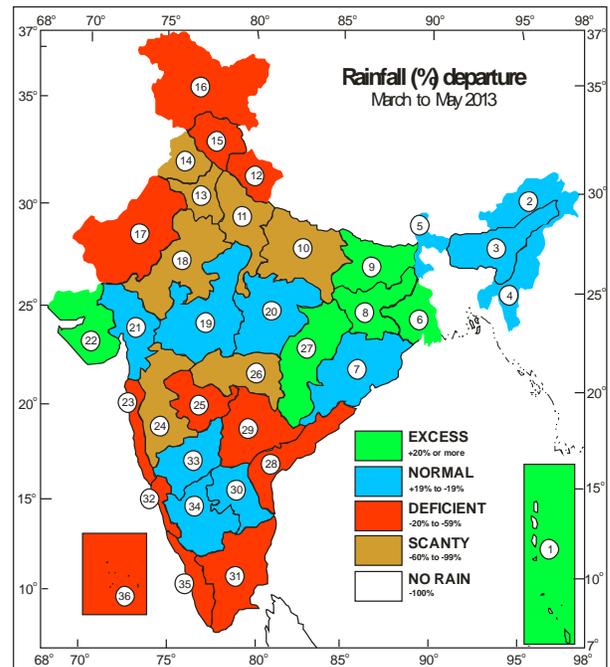
(v) Frequent hailstorms with moderate to severe intensity occurred over Andhra Pradesh in the month of April (9 April - 26 April). They claimed 60 lives and damaged around 63,000 hectares of crops and 1000 of dwellings.

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 2013 are also depicted in Fig. 1.

Synoptic scale weather systems including the Cyclonic Storm & Depression and moisture incursion due to the low level southerly winds caused *normal to excess* rainfall in east/northeast India. The core winds of sub-tropical westerly jet stream remained over a more southern latitude than normal and in combination with feeble north-south trough extending upto interior Peninsular India resulted in *normal to excess* rainfall over central India and parts of interior Peninsular India.

* Definition of words in italics other than the subtitles is given in Appendix.



EXCESS - 06 NORMAL - 11 DEFICIENT - 12 SCANTY - 07 NO RAIN - 00

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for winter season (January to February 2013). 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	-16	13	-71	19	-13	25	-44	31	-28
2	-17	8	37	14	-65	20	-5	26	-77	32	-31
3	-15	9	58	15	-46	21	-11	27	24	33	-11
4	-13	10	-60	16	-42	22	152	28	-35	34	-2
5	-3	11	-75	17	-53	23	-40	29	-34	35	-42
6	61	12	-58	18	-73	24	-67	30	-16	36	-44

The north-south trough/wind discontinuity remained feeble during most parts of the season mainly because the Oceanic High Pressure Areas (HIGHS) established temporarily with varying intensity and were highly oscillatory.

The seasonal rainfall over the meteorological sub-divisions was *deficient/ scanty* over major parts of the country outside A & N islands, the sub-divisions in east & northeast India, Odisha, Madhya Pradesh, Gujarat State, Chhattisgarh, Rayalaseema and Interior Karnataka, where it was *excess/normal*.

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TABLE 1
Sub-division wise rainfall (mm) for each month and season as a whole (March-May, 2013)

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.	Andaman & Nicobar Islands	43.0	25.0	72	46.3	81.5	-43	509.3	358.5	42	598.6	465.0	29
2.	Arunachal Pradesh	115.1	179.7	-36	175.1	278.8	-37	335.8	291.9	15	626.0	750.4	-17
3.	Assam & Meghalaya	44.4	77.7	-43	112.1	181.2	-38	347.0	331.3	5	503.6	590.2	-15
4.	Naga., Mani., Mizo. and Tri.	19.7	76.8	-74	60.3	149.4	-60	348.9	267.9	30	428.9	494.1	-13
5.	Sub-Himalayan West Bengal & Sikkim	32.1	63.6	-49	114.7	123.7	-7	296.5	269.8	10	443.4	457.1	-3
6.	Gangetic West Bengal	6.6	28.0	-76	48.4	42.1	15	210.7	94.7	123	265.7	164.8	61
7.	Orissa	2.1	27.0	-92	53.6	37.5	43	57.7	70.2	-18	113.4	134.7	-16
8.	Jharkhand	1.6	17.1	-91	22.3	18.4	21	85.0	43.9	94	109.0	79.4	37
9.	Bihar	0.6	10.1	-94	32.3	16.3	98	89.5	51.1	75	122.4	77.5	58
10.	East Uttar Pradesh	2.7	9.1	-70	8.7	5.6	56	1.1	17.0	-93	12.6	31.7	-60
11.	West Uttar Pradesh	3.6	11.3	-68	1.5	4.6	-68	2.1	13.2	-84	7.2	29.1	-75
12.	Uttaranchal	22.0	57.6	-62	24.7	33.3	-26	18.2	65.1	-72	65.0	156.0	-58
13.	Haryana, Chandigarh & Delhi	5.3	12.7	-58	3.3	7.5	-56	1.4	14.0	-90	10.0	34.2	-71
14.	Punjab	11.6	25.3	-54	3.4	12.5	-73	3.6	15.7	-77	18.6	53.5	-65
15.	Himachal Pradesh	75.1	114.2	-34	25.0	65.4	-62	31.3	65.3	-52	131.3	244.9	-46
16.	Jammu & Kashmir	58.6	151.9	-61	66.5	97.5	-32	64.3	76.6	-16	189.4	326.0	-42
17.	West Rajasthan	4.2	3.8	10	3.1	4.2	-27	1.7	11.1	-85	8.9	19.1	-53
18.	East Rajasthan	0.4	3.7	-89	3.2	2.9	11	1.0	10.8	-91	4.6	17.4	-73
19.	West Madhya Pradesh	8.5	4.6	85	2.8	2.0	41	0.4	6.9	-95	11.7	13.5	-13
20.	East Madhya Pradesh	14.1	12.5	13	9.5	5.5	72	0.3	7.1	-96	23.9	25.1	-5
21.	Gujarat region	0.1	1.0	-93	5.6	0.3	1764	0.0	5.1	-99	5.7	6.4	-11
22.	Saurashtra & Kutch	0.1	1.2	-92	9.6	0.2	4703	0.1	2.5	-95	9.8	3.9	152
23.	Konkan & Goa	0.0	0.0	-100	0.1	2.7	-98	22.1	34.3	-36	22.2	37.0	-40
24.	Madhya Maharashtra	0.8	2.7	-72	5.7	8.9	-35	6.0	26.2	-77	12.4	37.8	-67
25.	Marathawada	2.6	5.7	-54	7.9	6.5	22	6.4	18.1	-65	16.9	30.3	-44
26.	Vidarbha	3.8	12.0	-69	2.8	7.7	-64	0.5	11.2	-96	7.0	30.9	-77
27.	Chattisgarh	4.8	13.3	-64	45.5	13.8	230	5.7	18.1	-68	56.0	45.2	24
28.	Coastal Andhra Pradesh	4.5	11.1	-59	37.0	21.8	70	21.7	64.1	-66	63.2	97.0	-35
29.	Telangana	0.1	9.4	-99	25.1	16.5	52	12.5	30.9	-60	37.7	56.8	-34
30.	Rayalaseema	7.2	6.5	11	23.7	19.9	19	38.2	55.6	-31	69.1	82.0	-16
31.	Tamil Nadu	30.0	18.3	64	20.3	42.3	-52	42.0	67.5	-38	92.2	128.1	-28
32.	Coastal Karnataka	10.0	4.1	145	22.2	28.1	-21	91.9	146.6	-37	124.1	178.8	-31
33.	North interior Karnataka	3.0	5.2	-43	25.4	25.6	-1	47.4	54.3	-13	75.7	85.1	-11
34.	South interior Karnataka	11.7	8.5	38	34.6	43.8	-21	95.6	92.9	3	142.0	145.2	-2
35.	Kerala	49.9	30.4	64	49.3	109.5	-55	119.3	239.8	-50	218.5	379.7	-42
36.	Lakshadweep	37.5	11.8	218	5.3	48.9	-89	88.3	171.7	-49	131.1	232.4	-44

TABLE 2
Details of the weather systems during March 2013

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Western disturbances/eastward moving systems						
<i>(i) As upper air cyclonic circulations</i>						
1.	Upto 4.5 kms a.s.l.	2 - 4	Northeast Afghanistan and neighbourhood	Northeast	North Pakistan and adjoining northwestern parts of Jammu & Kashmir	Moved away on 4 evening
2.	Do	6 - 10	Do	Eastnortheast	Jammu & Kashmir and adjoining Himachal Pradesh	Moved away on 11
3.	Do	10 - 15	Northern parts of Afghanistan and neighbourhood	Do	Eastern parts of Jammu & Kashmir	Moved away on 16
4.	Do	16 - 19	Northeast Afghanistan and neighbourhood	Northeast	Northern parts of Jammu & Kashmir and neighbourhood	Moved away on 20. A trough aloft in mid-upper tropospheric levels was seen on 17 and 18
5.	Do	19 - 21	Northeast Afghanistan and adjoining north Pakistan	Do	Do	Moved away on 22
6.	Mid tropospheric levels	22 - 25	Central parts of Afghanistan	Do	Do	Moved away on 26
7.	upto 4.5 kms a.s.l.	26 - 28	Northeast Afghanistan and neighbourhood	Do	Jammu & Kashmir and neighbourhood	Moved away on 29
8.	Do	31 Mar - 4 Apr	North Pakistan and neighbourhood		Eastern parts of Jammu & Kashmir	Moved away on 5
<i>(ii) As an induced cyclonic circulations</i>						
1.	Lower tropospheric levels	13 - 14	West Rajasthan and neighbourhood	Northeast	Northeast Rajasthan and neighbourhood	Less marked on 15
2.	Up to 1.5 kms a.s.l.	29 - 30	Rajasthan and adjoining Haryana	Do	Uttarakhand and neighbourhood	Less marked on 31
3.	lower levels	31 Mar - 3 Apr	West Rajasthan and neighbourhood	Do	Haryana and neighbourhood	Less marked on 4
<i>(iii) As a trough in westerlies</i>						
1.	Mid & upper tropospheric levels	8 - 10	Long. 58° E, to the north of Lat. 27° N (at 5.8 km a.s.l.)	Eastnortheast	Long. 72° E, to the north of Lat. 30 ° N	Moved away on 11
2.	Do	11 - 14	Long. 50° E, to the north of Lat. 30° N (at 5.8 km a.s.l.)	Do	Long. 70° E, to the north of Lat. 25 ° N	Moved away on 15
3.	Lower tropospheric levels	14	Northeast Rajasthan and adjoining Haryana to Madhya Maharashtra	Stationary	<i>In situ</i>	Moved away on 15
4.	Lower levels	17	Eastern parts of Bihar to northwest Bay of Bengal across Jharkhand and Gangetic West Bengal	Do	Do	Less marked on 18
5.	Mid & upper tropospheric levels	27 - 28	Long. 62° E, to the north of Lat. 25° N (at 5.8 km a.s.l.)	Northeast	Long. 65° E, to the north of Lat. 25° N	Moved away on 29

TABLE 2 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(B) Other upper air cyclonic circulations						
1.	Mid tropospheric levels	1 - 3	South Andaman Sea off Sumatra coast	Stationary	<i>In situ</i>	Less marked on 4
2.	Up to 3.1 kms a.s.l.	7 - 8	Nagaland-Manipur-Mizoram-Tripura and neighbourhood	Do	Do	Less marked on 9
3.	Mid tropospheric levels	10 - 11	Assam & Meghalaya and neighbourhood	East	Assam & Meghalaya and adjoining Arunachal Pradesh	Less marked on 12
4.	Up to 2.1 kms a.s.l.	15	East Madhya Pradesh and neighbourhood	Stationary	<i>In situ</i>	Less marked on 16
5.	Lower tropospheric levels	15 - 16	South Tamil Nadu coast and adjoining Comorin area	West	Lakshadweep area and neighbourhood	Less marked on 17
6.	Up to 1.5 kms a.s.l.	16	North Madhya Maharashtra and neighbourhood	Stationary	<i>In situ</i>	Less marked on 17
7.	Mid tropospheric levels	21 - 29	Assam & Meghalaya and neighbourhood	Do	Do	Less marked on 30
8.	Up to 0.9 km a.s.l.	22 - 24	South Andaman Sea off Sumatra coast	West	Equatorial Indian Ocean and adjoining southeast Bay of Bengal	Less marked on 25
(C) Troughs in easterlies						
1.	Trough of low at mean sea level	17 - 20	Comorin-Maldives areas to north Kerala	West	South Arabian Sea and adjoining equatorial Indian Ocean	Moved away on 21
2.	Do	19 - 21	Equatorial Indian Ocean and adjoining southeast Bay of Bengal	Do	Equatorial Indian Ocean and adjoining southwest Bay of Bengal off Sri-Lanka coast	Less marked on 22
3.	Do	25 - 28	Southeast Bay of Bengal and neighbourhood	Do	Comorin-Maldives area and neighbourhood	Became less important on 29
(D) Trough / wind discontinuity						
1.	Lower tropospheric levels	15	South Tamil Nadu coast and adjoining Comorin area to south Madhya Maharashtra	Stationary	<i>In situ</i>	Less marked on 16
2.	Do	22 - 29	East Madhya Pradesh to Telangana across Vidarbha	West	Sub-Himalayan West Bengal & Sikkim to north Bay of Bengal across Gangetic West Bengal	Less marked on 30
3.	Do	27 Mar - 11 Apr (M)	West Rajasthan to Rayalaseema across west Madhya Pradesh, north Madhya Maharashtra, Marathwada and north interior Karnataka	Oscillatory	West Madhya Pradesh to south interior Karnataka across Vidarbha, Marathwada and north interior Karnataka	Less marked on 11 evening

TABLE 3
Details of the weather systems during April 2013

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Western Disturbances/eastward moving systems						
<i>(i) As upper air cyclonic circulations</i>						
1.	Mid tropospheric levels	7 - 11	Central parts of Afghanistan	Northeast	Eastern parts of Jammu & Kashmir and neighbourhood	A trough was seen aloft during 8 & 9 and moved away northeastwards on 10 whereas the W.D. moved away on 12
2.	Do	13 - 15(M)	Northeast Afghanistan and neighbourhood	Do	Northern parts of Jammu & Kashmir	Moved away on 15 evening
3.	Upto 3.1 kms a.s.l.	15 - 17 (M)	Do	Do	Jammu & Kashmir	Moved away on 17 evening
4.	Upto 4.5 kms a.s.l.	18 - 21	Northeast Afghanistan and adjoining Pakistan	Do	Jammu & Kashmir and neighbourhood	Moved away on 22
5.	Mid tropospheric levels	22 - 27	Do	Do	Jammu & Kashmir	Moved away on 28
6.	Do	28 Apr - 2 May	Do	Do	Northeastern parts of Jammu & Kashmir	Moved away on 3
<i>(ii) As induced cyclonic circulation</i>						
1.	Up to 1.5 kms a.s.l.	21	Northeast Rajasthan and adjoining Haryana	Stationary	<i>In situ</i>	Less marked on 22
2.	Up to 2.1 kms a.s.l.	22 - 27	Central Pakistan and adjoining west Rajasthan	East	North Madhya Pradesh and neighbourhood	Less marked on 28
<i>(iii) Troughs in westerlies</i>						
1.	Mid and upper tropospheric levels	1	Long. 65° E to the north of Lat. 30° N (at 5.8 kms a.s.l.)	Stationary	<i>In situ</i>	Moved away on 2
2.	Lower tropospheric levels	5	Sub-Himalayan West Bengal & Sikkim to north Bay of Bengal	Do	Do	Less marked on 6
3.	Upper tropospheric levels	25 - 27	Long. 60° E to the north of Lat. 30° N (at 7.6 kms a.s.l.)	Do	Do	Became unimportant on 28
4.	Lower tropospheric levels	27 - 29	Sub-Himalayan West Bengal & Sikkim to north Bay of Bengal across Gangetic West Bengal	Do	Do	Became less marked on 30
5.	Upper tropospheric levels	29 Apr - 1 May	Long. 65° E to the north of Lat. 30° N (at 7.6 kms a.s.l.)	Do	Long. 73° E to the north of Lat. 30° N	Moved away northeastward on 2 May
(B) Other upper air cyclonic circulations						
1.	Upto lower tropospheric levels	6 - 9	Arunachal Pradesh and neighbourhood	West	Assam & Meghalaya and neighbourhood	Less marked on 10
2.	Up to 1.5 kms a.s.l.	14 - 15(M)	Central parts of Madhya Pradesh	East	East Madhya Pradesh and adjoining Chhattisgarh	Less marked on 15 evening
3.	Do	14 - 21	Assam & Meghalaya and neighbourhood	Do	Assam & Meghalaya and adjoining Arunachal Pradesh	Less marked on 22
4.	Do	17 - 22	Bihar and neighbourhood	Oscillatory	West central Bay of Bengal off south Odisha-north Andhra Pradesh coast	Less marked on 23

TABLE 3 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	Up to 1.5 kms.a.s.l.	15 - 16	Gulf of Mannar and adjoining Comorin area	Quasi-Stationary	South Tamil Nadu and neighbourhood	Less marked on 17
6.	Upto mid tropospheric levels	13 - 16	Sumatra coast and adjoining south Andaman Sea	West	Equatorial Indian Ocean and adjoining southeast Bay of Bengal	Less marked on 17
7.	Between Lower and Mid tropospheric levels	19 - 21	Central parts of Madhya Pradesh	Northeast	Bihar and neighbourhood	Less marked on 22
8.	Up to 1.5 kms a.s.l.	19	East Rajasthan and neighbourhood	Stationary	<i>In situ</i>	Less marked on 20
9.	Up to 2.1 kms a.s.l.	30 Apr - 1 May	Assam & Meghalaya and neighbourhood	Do	Do	Less marked on 2
10.	Up to 0.9 kms a.s.l.	26 - 27(M)	South Tamil Nadu and adjoining Comorin area	West	Comorin-Maldives areas off south Kerala coast	Less marked on 27 evening
11.	Up to 1.5 kms a.s.l.	29 Apr - 31 May	South Tamil Nadu and neighbourhood	Stationary	<i>In situ</i>	Merged with the trough over south Tamil Nadu and neighbourhood on 1 May
(C) Troughs in easterlies						
1.	At mean sea level	3 - 5	Southeast Bay of Bengal and adjoining south Andaman Sea	West	Southwest Bay of Bengal off Sri Lanka coast	Less marked on 6
(D) Other Troughs / wind discontinuity						
1.	Lower levels	10 - 13	Sub-Himalayan West Bengal & Sikkim to Odisha across	West	Sub-Himalayan West Bengal & Sikkim to north interior Karnataka across Bihar, Jharkhand, Vidarbha and Marathwada	Less marked on 14
2.	Do	14	Central parts of Madhya Pradesh to south Tamil Nadu across Vidarbha, Marathwada and interior Karnataka	Stationary	<i>In situ</i>	Less marked on 15
3.	Do	19 Apr - 13 May	Jharkhand and neighbourhood to Vidarbha across Chhattisgarh	Oscillatory	Bihar and neighbourhood to south Tamil Nadu across east Madhya Pradesh, Chhattisgarh and interior Andhra Pradesh	Less marked on 14

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 principal amounts of rainfall are given in Table 5.

The continuous passage of Western disturbances did not cause much precipitation over northwest India during the month as the high index pattern in mid-latitude wind tides caused the systems to move and follow a more northerly track.

Perturbations in easterly wind regime caused heavy rainfall at isolated places over south peninsular India during the first two weeks. A confluence between the systems in westerly-easterly wind regimes caused increase in rainfall activity during the third week. Central India & Peninsular India experienced intense convective activity during the last week.

3.1.2. Temperature distribution

(i) Minimum temperatures

Cold wave conditions prevailed on 1 to 3 days in some parts of Madhya Pradesh and Rajasthan.

TABLE 4
Details of the weather systems during May 2013

S. No.	System	Duration	Place of first location	Direction of movement	Place of final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) Cyclonic Storm/Very Severe Cyclonic Storm						
1.	Cyclonic Storm (VIYARU*)	10 - 16	Southeast Bay of Bengal and neighbourhood. (Lat. 5° N / Long. 92° E)	Northeast	(Lat. 25° N / Long. 93.5° E)	It was seen first as a low pressure area over southeast Bay of Bengal on 8 and became as a well marked low pressure area over southeast Bay of Bengal and neighbourhood on 10. It became unimportant as it moved northeastward towards Myanmar. Associated cyclonic circulation extended upto mid tropospheric levels
(B) Deep Depression/Depression						
1.	Depression	29 - 31(M)	Within a half degree of Lat. 21° N / Long. 89.5° E	Northwest	Jharkhand and neighbourhood	Under the influence of the embedded cyclonic circulation over northwest Bay of Bengal a low pressure area formed over north Bay of Bengal and neighbourhood on 28 th and concentrated into a Depression. It weakened into a WML on Less marked on 2 June
(C) Low pressure area						
1.	Low pressure area	27 - 28	West central Arabian Sea	Stationary	<i>In situ</i>	It moved westwards and became unimportant on 29. Associated cyclonic circulation extended upto mid tropospheric levels
(D) Western Disturbances / eastward moving systems						
<i>(i) As upper air cyclonic circulations</i>						
1.	Mid -tropospheric levels	3 - 6	Northeast Afghanistan and adjoining north Pakistan	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 7 th
2.	Do	10 - 13	Northeast Afghanistan and adjoining Pakistan	Do	Eastern parts of Jammu & Kashmir	Moved away on 14 th
3.	Upto 4.5 kms a.s.l.	15 - 16	North Pakistan and neighbourhood	Do	North Pakistan and adjoining Jammu & Kashmir	Moved away on 17 th
4.	Do	18 - 22	Northeast Afghanistan and neighbourhood	Do	Jammu & Kashmir and neighbourhood	Moved away on 23 rd
5.	Do	23 - 28	Nnortheast Afghanistan and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away on 29 th
<i>(ii) As induced cyclonic circulations</i>						
1.	Lower tropospheric levels	5 - 7	Punjab and neighbourhood	Southeast	West Rajasthan and neighbourhood	Moved away on 8 th
2.	Upto 1.5 kms a.s.l.	22 - 23	Haryana and neighbourhood	East	East Uttar Pradesh and neighbourhood	Merged with cyclonic circulation over Nagaland-Manipur-Mizoram-Tripura and neighbourhood on 24
3.	Lower levels	27 - 28	Do	Stationary	<i>In situ</i>	Less marked on 29 th

TABLE 4 (Contd.)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
<i>(iii) Troughs in westerlies</i>						
1.	Mid and upper tropospheric levels	10 - 12	Long. 67° E to the north of Lat. 25° N (axis at 7.6 & 5.8 kms a.s.l.)	Northeast	Long. 80° E to the north of Lat. 30° N	Moved away on 13 th
2.	Upper tropospheric levels	26 - 28	Long. 55° E to the north of Lat. 25° N (axis at 7.6 kms a.s.l.)	Do	Long. 75° E to the north of Lat. 30° N	Moved away on 29 th
<i>(E) Other cyclonic circulations</i>						
1.	Mid tropospheric levels	3 - 11	Assam & Meghalaya and neighbourhood	Stationary	<i>In situ</i>	Less marked on 12 th
2.	Lower tropospheric levels	6 - 12	Bihar and neighbourhood	Oscillatory	Sub-Himalayan West Bengal & Sikkim and neighbourhood	Less marked on 13 th
3.	Do	5 - 6	South Tamil Nadu and neighbourhood	Quasi-Stationary	Comorin area and neighbourhood	Less marked on 7 th
4.	Upto 3.1 kms a.s.l.	12	Haryana and neighbourhood	Stationary	<i>In situ</i>	Less marked on 13 th
5.	Lower & Mid tropospheric levels	12 - 26	East Uttar Pradesh and neighbourhood	East	Assam & Meghalaya and neighbourhood	Less marked on 27 th
6.	Upto 10.9 kms a.s.l.	14	North Tamil Nadu and neighbourhood	Stationary	<i>In situ</i>	Less marked on 15 th
7.	Up to 1.5 kms a.s.l.	15	Telangana and neighbourhood	Do	Do	Less marked on 16 th
8.	Do	17 - 26	East Uttar Pradesh and neighbourhood	Oscillatory	Southeast Uttar Pradesh and neighbourhood	Less marked on 27 th
9.	Upto 3.1 kms a.s.l.	17 - 20	South Andaman Sea and adjoining Sumatra Islands	East	south Andaman Sea and neighbourhood	Less marked on 21 st
10.	Between 1.5 & 3.1 kms a.s.l.	17	Sri Lanka and neighbourhood	Stationary	<i>In situ</i>	Less marked on 18 th
11.	Between 2.1 & 3.6 kms a.s.l.	20	Sri Lanka and neighbourhood	Do	Do	Less marked on 21 st
<i>(F) Troughs in easterlies</i>						
1.	Lower levels	1	Equatorial Indian Ocean to south Tamil Nadu and neighbourhood	Do	Do	Less marked on 2 nd
<i>(G) East-West shear zone</i>						
1.	East-west shear zone (between mid & upper troposphere)	31 May - 15 Jun	Along Lat. 10° N	Do	Along Lat. 20° N	Became less marked on 16 th June
<i>(H) Trough/wind discontinuity</i>						
1.	Lower & Mid tropospheric levels	2 - 5	Eastern parts of Bihar to northwest Bay of Bengal across Jharkhand and Gangetic west Bengal	East	Sub-Himalayan West Bengal & Sikkim to north Bay of Bengal across Gangetic West Bengal	Less marked on 6 th

TABLE 5

Some representative amounts of rainfall in cm for the months March, April and May 2013 (3 cm and above)

Date	March	April	May
1	Nancowry 5	Nelamangala & Atmakur 6 each, Ramanagara 5, Channapatna & Tuting 4 each, Chilamattur, Gudibande, Sidlaghatta, Thondebhavi, Udaipur, Srinivasapur & Madhavara ARG 3 each	Gyalsing AWS & Bihar 7 each, Gossaigaon, Kokrajhar & Jorhat 6 each, Jorhat AWS, Dharmanagar / Panisagar, Passighat, Khowang, Nalbari (Barkhetri AWS), Gangtok, Tadong, Punalur & Mushalpur AWS 5 each, Thiruvananthapuram AP, Bahalpur, Thiruvananthapuram, Mangan & Athgarh 4 each, Cherrapunji, Kollam Rly, Barobhisha, Panbari, Haflong, Bhuban ARG, Hindol, Matijuri, Chepan, Goalpara, Beki Mathungari, Raikia ARG & Neamatighat 3 each
2	Nil	Odagaon ARG 7, Gundlupet & Gundlupet ARG 5 each, Rudrur AP & Metpalli 4 each, Siricilla, Hindol, Chandrapur, Thali, Hunsur Tb, Mudhole, Dubak, Quazigund, Adilabad AP & Adilabad 3 each	Tezu AWS 13, Tezu 11, Cherrapunji 10, Maya Bandar & Cherrapunji (Rkm) 9 each, Khowang 8, Sivasagar, Thodupuzha, Itanagar, Nahar Katia, Naharlagun, N. Lakhimpur & Sivagiri 7 each, Miao, Hasimara & Namsai 6 each, Digboi, Chauldhowaghat, Dholla Bazar, Kaptipada ARG, Punalur, Dillighat, Periyakulam, Tezpur & Kumargram 5 each, Mangan, Puthimari, Dharmanagar / Panisagar, Deomali AWS, Goalpara, Barobhisha, Deomali, Rangiya, Gossaigaon, Dhuri CWC, Jorhat, Margherita, Nalbari / Pagladia, Tinsukia AWS & Kodungallur 4 each, Kajolgaon AWS, Bihpuria AWS, Jorhat AWS, Dhubri, Aie Nh Xing, Vaikom, Haflong, Karimganj, Silchar, Ramanathapuram, Nippani, Kozha, Roing AWS, Chepan, Golaghat CWC, Dibrugarh AP, Panbari, Manash Nh Xing, Gangtok, Pamban, Neamatighat, Annapurnaghat, Nedumangad, Matijuri, Dhemaaji AWS, Mohanbari AWS & Sivasagar AWS 3 each
3	Car Nicobar 3	Harichandanpur ARG 6, Ibrahimpatnam 5, Kaptipada ARG, Pushparajgarh, Hyderabad, Hyderabad AP, Golkonda & Hakimpet 4 each, Tadpatri, Medak, Naktideul, Atabira ARG, Telkoi, Arogyavaram, T. Narsipur, Kamareddy & Mandla 3 each	Cherrapunji 22, Cherrapunji (Rkm) & Dholai 13 each, Tuting 12, Tezu 11, Amraghat 10, Lakhipur 9, Anini AWS 8, Silchar & Jiribam AWS 7 each; Mangan, Annapurnaghat & Kajolgaon AWS 6 each, Aie Nh Xing, Hospet, Kottur, Varkala, Khowang & Gadag 5 each, Diamond Harbour, Kampli, Goalpara, Kushtagi, Matijuri, Haflong, Miao & Bihpuria AWS 4 each, Bahalpur, Melabazar / Matunga, Tangla, Dindigul, Tinsukia, Manash Nh Xing, Dholla Bazar, Dibrugarh AP, Nalbari / Pagladia, Kaptipada ARG, Karatgi, Jia Bharali N T Xing, Mohanbari AWS, Hut Bay, Tawang AWS, Drf, Itanagar, Rangiya, Karimganj, Munirabad & Chauldhowaghat 3 each
4	Car Nicobar 3	Tawang AWS 5, Haflong, Thoubal AWS, Bihar, Keertinagar, Khowai, Sivasagar AWS & Guler 3 each	Jia Bharali N T Xing 15, Cherrapunji (Rkm) 13, Anini AWS 12, Cherrapunji & Kamalpur 10 each, Silchar & Kailashahar 9 each, Annapurnaghat & Dharmanagar / Panisagar 8 each, Silchar AP, Soro, Tuting, Matijuri, Amarpur & Passighat 7 each, Jiribam AWS, Along AWS, Athgarh, Thoubal AWS & Basar 6 each, Nilgiri, Lakhipur, Khowai, Basar AWS, Imphal, Kolasib AWS, Haflong, Remuna ARG, Amraghat, Tezu AWS & Imphal AWS 5 each, Aizwal AWS, Khowai AWS, Lengpui, Thali, Udaipur, Gokulpur AWS, Tezu & Honur ARG 4 each, Chhamonu, Nanjangud, Dholai, Chauldhowaghat, Aizawal, Avathi ARG, Balasore, B P Ghat, Hogenekal, Melabazar / Matunga, Sabroom, Betanati ARG, Naraj, Drf, Begur, Lunglei AWS & Baripada 3 each
5	Muthupet 7, Car Nicobar 6, Car Nicobar 5, Vedaranniyam & Pamban 4 each	Miao 5, Namsai 4, Tinsukia, Imphal, Imphal AWS & Dholla Bazar 3 each	Arundhutinagar & A. D. Nagar AWS 8 each, Sonamura & Sabroom 7 each, Gokulpur AWS, Agartala AP, Bishalgarh, Silchar & Amarpur 6 each, Teliamura, Beky Rly. Bridge, Tirupuvanam, Aizwal AWS, Jia Bharali N T Xing, Barpetta, Saiha AWS, Palani, Melabazar /

TABLE 5 (Contd.)

Date	March	April	May
			Matunga, Udaipur, Lawngtlai AWS & Devala 5 each, Serchip AWS, Matijuri, Aizawal, Dharmanagar / Panisagar, Khowai, Itanagar, Coonoor, Coonoor PTO, Tezpur, Kamalpur AWS, Kailashahar & Kamalpur 4 each, Chhamonu, Numaligarh, Lengpui, Chauldhowaghat, Malavalli ARG, Manash Nh Xing, Baghmara AWS, Naharlagun, Bagrakote, Thali, Khowang, Dhemaji AWS, Champai AWS, Khowai AWS, Basar AWS, Cheranmahadevi, Aie Nh Xing, Silchar AP, Periyakulam & Mandya 3 each
6	Manimutharu u u 12, Peravurani 11, Arantangi & Madukkur 9 each, Thiruthuraipoondi, Muthupet, Arimalam, Pudukottai & Pattukottai 8 each, Adirampattinam, Mannargudi & Kadaladi 7 each, Orthanad 6, Kamudhi, Tondi, Tiruvarur, Alangudi, Tirumayam, Sivaganga, Devakottai, Rameswaram & Illayangudi 5 each, Pandavaiyar Head, Tirupuvanam, Tirupathur, Thoothukudi, Sattur & Pamban 4 each, Ambasamudram, Marungapuri, Manamadurai, Ramanathapuram, Gandarvakottai, Paramakudi, Thiruchuzhi, Cuddalore, Keeranur, Needamangalam, Sirkali, Melur, R. S. Mangalam, Vedaranniyam, Natham, Tiruchendur, Kodaikanal, Perungalur & Cheranmahadevi 3 each	Anini AWS & Begur 5 each, Gundlupet 4, Ramanagara, Naduvattam, Gundlupet ARG, Tuting, T. Narsipur & Mangan 3 each	Arundhutinagar 10, Gangtok 9, Agartala AP & Teliamura 7 each, Serchip AWS & Khowai 6 each, Tadong, Udaipur, Begur, Dholai, Lunglei AWS & Aizwal AWS 5 each, Amarpur, Silchar, Sabroom, Amraghat, A D Nagar AWS, Hasimara, Balehonnur, Kohima, Dillighat, Champai AWS, Lengpui, Chepan, Gokulpur AWS, Thoubal AWS & Matijuri 4 each, Annapurnaghat, Silchar AP, Khowai AWS, Kokrajhar, Imphal, Gossaigaon, Gajoldoba, Goalpara, Imphal AWS, Avathi ARG, Tezpur, Pedong, Aizawal, Jiribam AWS, Udaipur, Bishalgarh, Sevoke, Kharidwar, Guwahati AP, Mamit AWS, Nuggehalli, Chhamonu, Lakhipur, Zunheboto AWS, Pavagada AWS, Bijepur, Jhorigan ARG & Dabugan ARG 3 each
7	Manimutharu u u & Tada 13 each, Majitar 8, Mannargudi & Long Islands 7 each, Minicoy 6, Khanitar, Kaveripakkam, Namthang, Thiruthuraipoondi, Wallajah, Poondi, Vellore & Watrap 5 each, Gudiyatham, Sullurpet, Rayachoti, Tiruttani, Sivagiri, Cuddalore, Venkatagiri Town, Dgp Office, Gudur, Mananthavady & Pudukottai 4 each, Gingee, Parangipettai, Ambur, Illuppur, Chennai AP, Ponneri, Ambasamudram, Tambaram, Chittoor, Marungapuri, Tirukoilur, Gangtok, Vilupuram, Keeranur, Needamangalam, Peraiyur, Srikalahasthi, Chatrapatti (Odanchatra), Tadong, Melalathur, Arimalam, Chidambaram, Kancheepuram, Satyavedu, Vedaranniyam & Cheranmahadevi 3 each	Nil	Sonamura 14, Korei ARG 11, Anandpur 10, Basudevapur AWS 9, Sabroom, Matijuri, Nongstain AWS, Soro, Akhuapada, Udaipur, Saiha AWS & Gokulpur AWS 8 each, Dholai, Tihidi ARG, Danagadi ARG, Khowai, Lawngtlai AWS, Chandbali, Kaptipada ARG, Amraghat, Bishalgarh & Bari ARG 7 each, Vaikom, Rajkanika, Thuckalay, Jiribam AWS, Lunglei AWS, Serchip AWS & Khowai AWS 6 each, Kanyakumari, Champua, Konni, Ghatagaon, Cuttack, Arundhutinagar, Thakurmunda, Bhadrak AWS, Bhoothapandy, Swam-Patna, Amarpur, Nagercoil, Thenkasi, Champai AWS, Bonth, Silchar & Udala 5 each, Silchar AP, Kamalpur, Kamalpur AWS, Cherrapunji, Lakhipur, Binjharapur ARG, Derabis ARG, Varkala, Gangtok, Guwahati AP, Gharmura, Agartala AP, Barapani, Jaipur, Samakhunta AWS, Cherrapunji (Rkm), Khanitar, Kanjitrappally, Lengpui, Alappuzha, Mylaudy, Shillong AWS, Dhamnagar ARG, Kantapada ARG & Shillong 4 each, Manash Nh Xing, Baripada, Aizwal AWS, Annapurnaghat, B. P. Ghat, Krishnarajasagara, Kailashahar, Betanati ARG, Nanguneri, Kozha, Nedumangad, Pedong, Mahanga ARG, Thiruvananthapuram AP, Aizawal, Eraniel, Balurghat, Teliamura, Mamit AWS, Jaipur, Nimpara, Kendrapara, Kunigal ARG, Aie Nh Xing, Lumding, Cherthala, Uttamapalayam & Chhamonu 3 each

TABLE 5 (Contd.)

Date	March	April	May
8	Somwarpet T.O. 10, Tirupathi AP & Dharmasthala 7 each, Udayagiri, Medikeri, Kushal Nagar & Madapur 6 each, Alur & Harangi 5 each, Manimutharu u u 4, Rapur, Tirumalla AP, Valparai, Valparai Taluk Office, Polur, Pullambadi, Gandarvakottai, Mani, Belthangady, Konanur & Ambalavayal 3 each	Attur 3	Kailashahar 15, Dharmanagar / Panisagar & Khowai 13 each, Zunheboto AWS 8, Cooch Behar, Kamalpur & Kamalpur AWS 7 each, Matijuri, Tirupuvanam & Chhamonu 6 each, Khowai AWS, Teliamura, Aizwal AWS, Piravam & Saiha AWS 5 each, Gangtok, Amarpur, Periyakulam, Jiribam AWS, Kozha & Lakhipur 4 each, Guwahati AP, Amraghat, Periyakulam AWS, Silchar, Silchar AP, Tadong, Vaikom, Kottayam, Lengpui, Champai AWS, Mamit AWS, Sivaganga, Annapurnaghat, Kayamkulam & Cherrapunji (Rkm) 3 each
9	Coonoor 7, Kothagiri & Mangalooru 5 each, Alappuzha, Tirumayam & Panambur 3 each	Nil	Arundhutinagar 13, Amarpur 12, Jharnapani, Jharnapani AWS, Agartala AP, Dimapur AWS, Bokajan & Amarapuram 11 each, Matijuri & Chitradurga 9 each, Kohima AWS, Lengpui & Barapani 7 each, Aizawal, Lumding, Gangavati HMS, Champai AWS, Khowai AWS, Bihubar, Badami, Parasurampura & Kampur 6 each, Teliamura, Nargund, Saiha AWS, Golaghat, Gharmura, Kamalpur, Serchip AWS, Dholai, Kohima, Mokochung AWS, B. Durga, Sattur, Hospet, Tezpur, Dhone & Challakere 5 each, Golaghat CWC, Jaipur, Guledgund, Ajjampura R, Khowang, Amraghat, Numaligarh, Balehonnur, Udaipur, Gokulpur AWS, Hungund, Phek, Jia Bharali N T Xing, Lunglei AWS, Mamit AWS, Ukhrul AWS, Holalkere, Dillighat & Nalbari (Barkhetri AWS) 4 each, Dibrugarh AP, Mohanbari AWS, Zunheboto AWS, Sandur, Thoubal AWS, Guwahati AP, Maski, B. P. Ghat, Chhamonu, Palayamkottai, Hagaribommanahalli, Navalgund, Bydgi, Turuvekere, Shivani, Thippagondanahalli, Aizwal AWS, Imphal AWS, Kamudhi, Tarikere, Santebennur, Chikkanahalli PTO, Savanur, Bevoor, Lakhipur, Kamalpur AWS, Kittur & Bhimaranagudi ARG 3 each
10	Vadakkancherry & Vadakara 6 each, Subramanya, Enamakal, Chalakudi, Pattambi, Annur & Piravam 4 each, Aluva PWD, Mettupalayam, Thiruvanthapuram, Manjeri, Kanjirappally & Alathur 3 each	Margherita, Varkala & Aryankavu 4 each, Haripad, Kottayam, Nahar Katia & Yegati 3 each	Chhamonu 11, Mangan 9, Champai AWS, Aizwal AWS, Kailashahar & Dholai 8 each, Dhekiajuli, Nalbari (Barkhetri AWS), Amraghat, Kamalpur, Kamalpur AWS, Lengpui & Digboi 7 each, Teliamura, Bihubar, Gharmura, Bihpuria AWS & Cherrapunji 6 each, Matijuri, Khowai, Phek, Dharmanagar / Panisagar, Guwahati AP, Annapurnaghat, Silchar AP, Sivasagar, Saiha AWS, Jia Bharali N T Xing, Goalpara & Cherrapunji (Rkm) 5 each, Lawngtlai AWS, Silchar, Lakhipur, Amarpur, Gokulpur AWS, Udaipur, Arundhutinagar, Jiribam AWS, Bahalpur, Mamit AWS, Khowai AWS & Aizawal 4 each, B. P. Ghat, Zunheboto AWS, Dharamtul, Agartala AP, Lunglei AWS, Beky Rly. Bridge, Neamatighat, Sonamura, Agathi, Kokrajhar AWS, Sivasagar AWS, Serchip AWS, Barapani & Bishalgarh 3 each
11	Kanjirappally, Mangan & Basaralu 3 each	Cherrapunji & Cherrapunji (Rkm) 8 each, Tezu 7, Tezu AWS, Dholia Bazar, Basar & Tawang AWS 6 each, Tadong 5, Jiagaon, Bhalukpong & Miao 4 each, Gangtok, Bhagamandala, Goalpara Cwc, Namsai & Sunibhaji 3 each	Mokochung AWS 12, Chhamonu 10, Erode & Agartala AP 7 each, Tikrikilla, Lengpui, Karimganj, Guwahati AP, Madapur, Gharmura, Aizwal AWS, Sabroom, Kamalpur & Kamalpur AWS 6 each, Goalpara, Gangtok, B P Ghat, Champai AWS, Bapatla AP & Aizawal 5 each, Mamit AWS, Dharmanagar / Panisagar, Jiribam AWS, Hesaraghatta ARG, Lawngtlai AWS, Thali, Zunheboto AWS, Baghmara AWS, Hessarghatta, Kailashahar, Anini AWS, Arundhutinagar, Kheronighat, Amarpur, Nancowry, Matijuri & Digboi 4 each, Karur, Cherrapunji, Kollegal, Sankaridurg, Jia Bharali N. T. Xing, Gokulpur AWS, Devanhalli, Car Nicobar IAF,

TABLE 5 (Contd.)

Date	March	April	May
			Ghatagaon, Nelamangala, Hut Bay, Halli Mysore, Puthimari, Tumkur, Bishalgarh & Saiha AWS 3 each
12	Madapur 7, Jagalur, Harangi & Irikkur 6 each, Konanur, Mudigere & Subramanya 5 each, Ziro & Medikeri 4 each, Belur, Kottayam, Kushal Nagar, Channagiri, Shivani, Vaikom, Kavaratti & Kuppady 3 each	Tawang AWS 9, Tezu & Namsai 7 each, Tezu AWS & Anini AWS 6 each, Udala & Thuckalay 5 each, Bhalukpong, Tinsukia, Dibrugarh AP, Dholla Bazar & Jia Bharali N. T. Xing 4 each, Mohanbari AWS, Tuting, Jiagaon, Miao, Aurad & Barpeta 3 each	Cherrapunji 13, Cherrapunji (Rkm) 11, Mamit AWS & Dhubri CWC 7 each, Dhubri, Tikrikilla & Alipurduar CWC 6 each, Buxaduar, Aie Nh Xing, Mohanbari AWS, Jorhat, Dibrugarh AP, Jorhat AWS, Forbesganj, Channapatna, Bihubar, Bokajan, Tezpur, Amarpur, Seppa AWS, Kajolgaon AWS, Kamalpur, Majbhat, Nahar Katia & Holenarsipur 5 each, Chepan, Numaligarh, Gossaigaon, Lakhipur, Margherita, Cooch Behar, Tadong, Napoklu, Virajpet, Pundibari AWS, B. P. Ghat, Golaghat, Gharmura & Golaghat CWC 4 each, Bomdila AWS, Kuppam, Manash Nh Xing, Barobhisha, Beki Mathungari, Dharmasala, Jubbal, Mathabhanga, Goalpara, Hasimara, Dharamtul, Rampurhat (Drms), Dhemaji AWS, Amraghat, Sarguru, Kokrajhar, Bengaluru AP, Sravanabelagola, Tirupattur, Tirupathur PTO, Kandaghat, Ketti, Araria, Bely Rly. Bridge, Dholai, Tinsukia, Zunheboto AWS, Jalpaiguri & Hassan 3 each
13	Yemmiganur 5, Avathi ARG 3	Margherita 9, Nahar Katia 8, Melabazar / Matunga 7, Deomali AWS & Deomali 6 each, Drf & Cherrapunji 5 each, Khowang 4, Tangla, N. Lakhimpur, Dillighat & Bihubar 3 each	Jia Bharali N. T. Xing 21, Nahar Katia & Mangan 7 each, Khowang, Satyavedu, Nalbari (Barkhetri AWS), Guwahati A. P. & Amarpur 6 each, Khawai, Kotkhai, Valangaiman, Kalasa, Belur, Sukiapokhri, Dharmanagar / Panisagar, Chennai A. P., Deomali, Kamalpur AWS, Binjharpur ARG, Malkangiri, Vijaywada AP, Thamaraipakkam, Dillighat, Deomali AWS, Kolkata & Ghatagaon 5 each, Kailashahar, Bahalpur, Remuna ARG, Bihubar, Therlam, Along AWS, Halebeedu & Lam AP 4 each, Tuting, Anini AWS, Basar AWS, Chhamonu, Bhuvan ARG, Kolkata AP, Chickmagalur, Tawang AWS, Perumallapalli AP, Gajoldoba, Paderu, Gharmura, Diamond Harbour, Kashinagar, Sivasagar AWS, Champai AWS, Margherita, Cuttack, Bankura CWC, Car Nicobar IAF, Goalpara, Aizwal AWS, Saiha AWS, Serchip AWS, Lengpui, Car Nicobar, Hasimara, Chintamani PTO, Barbigaha, Bhalukpong, Bishalgarh, Mahendragarh, Dibrugarh AP, Tambaram, Aligarh, Nandigama, Bahaich, Matijuri, Jorhat, Ponnani, Canning Town, Nh5 Gobindpur, Karimganj, Araku Valley & Arakonam 3 each
14	Banihal, Poonch, Baderwah, Kupwara, Hissar, Pahalgam, Nainpur & Saloni 3 each	Cherrapunji 10, Cherrapunji (Rkm) & Kosagumda 8 each, Jharsuguda AP 7, Kaptipada ARG 5, Nahar Katia, Dholla Bazar, Dillighat, Bhanupratappur & Deogaon 4 each, Bamra ARG, Tuting, Gurundia ARG, Panposh, Balisankara ARG, Roing AWS, Dhemaji AWS, Keiri AWS, Jiagaon, Dabaka, Tinsukia AWS & Baijnath 3 each	Berhampore & Tinsukia 8 each, Punalur 7, Dibrugarh AP, Miao, Kumargram, Mohanbari AWS, Asansol CWC, Passighat, Margherita, Dhemaji AWS, Rampurhat (Drms) & Namsai 5 each, Jia Bharali N T Xing, Rajmahal, Khowang, Deomali AWS, Thodupuzha, Deomali, Betanati ARG, Panagarh AP, Simula, Amarpur & Nahar Katia 4 each, Suri CWC, Dholla Bazar, Konni, Lakhipur, Tilpara Barrage, Champai AWS, N. Lakhimpur, Rangiya, Bihpuria AWS, Tuting, Annapurnaghat, Durgapur, Tawang AWS, Along AWS, Maithon, Dharamtul, Nandadih, Sriniketan & Panchet 3 each
15	Banjar & Bhuntar AP 5 each, Manali, Jubbal, Kotkhai, Seo Bagh, Naraingarh, Sunibhaji, Karsog, Rampur Bushar & Dhundi 4 each, Rohru, Shimla, Joshimath, Gohar, Kumarsain, Dunda, Shimla AP, Kandaghat, Rewa & Chamoli 3 each	Tuting & Punalur 6 each, Kollam Rly & Bely Rly. Bridge 5 each, Puthimari, Dholla Bazar, Barpeta, Nahar Katia & Surajpur 4 each, Daparijo, Kamalpur, Silchar, Tadong, Goalpara, Aie Nh Xing, Gangtok, Anini AWS, Baikunthpur, Dibrugarh AP, Passighat, Mohanbari AWS, Srivilliputhur, Idukki, Laikera, Jiagaon, Kajolgaon AWS, Kayamkulam, Miao, Rangiya,	Thakurganj & Melabazar / Matunga 7 each, Dholai 6, Gajoldoba, Falakata, GoalparaCwc & Tuting 5 each, Kashipur 4, Yelamanchili AP, Tikabali, Machilipatnam, Nagarkata, Bhanjnar, Pundibari AWS, Nh31 Bridge, Gudari, Domohani, Cooch Behar, Itanagar, Athmalik, Forbesganj, Naharlagun, Dholla Bazar, Karimganj, Kotagarh, Cheepurupalli & Buxaduar 3 each

TABLE 5 (Contd.)

Date	March	April	May
		Silchar AP, Manamelkudi, Mukteswar, Mangan, Kokrajhar AWS, Nongstain AWS & Annapurnaghat 3 each	
16	Thenkasi 4, Shencottah, Palayamkottai, Pachmarhi, Ramanathapuram & Orthanad 3 each	Huliyardurga 9, Miao 7, Palayamkottai, B P Ghat, Pennagaram, Kamalpur & Kamalpur AWS 6 each, Malavalli, Sankarankoil, Malavalli ARG, Basaralu & Gajoldoba 5 each, Phek, Poonch, Kuppam, Maddanur, Khowai & Devarkonda 4 each, Chhamonu, Nagarkata, Tezu AWS, Lakhipur, Satankulam, Tezu, Jharnapani, Jharnapani AWS, K. Paramathy, Chintamani, Agartala AP, Kohima AWS, Dharmanagar / Panisagar, Honakere, Rayakottah, Goalpara, Dholai, Lumding, Gulmarg, Jammalamadugu, Bhavani, Shoolagiri, Uthagamandalam AWS, Hogenekal, Aizwal AWS, Baramulla AWS, Panchapatti, Darjeeling, M M Hills, Kupwara, Yercaud, Venkatagirikota, Maddur, Uthagamandalam & Tezpur 3 each	Arundhutinagar 9 each, Agartala AP & Bishalgarh 8 each, Sonamura 7, Sabroom 5, Araria, Gokulpur AWS, Tuting, Teliamura, Udaipur & Aizwal AWS 4 each, Khowai, Ariyalur, Kailashahar, Gyalsing AWS, Aizawal, Amarapur, Matijuri & Zunheboto AWS 3 each
17	Biaora, Murnadu, Chachoda, Lateri & Shajapur 5 each, Bashirhat, Dharwad Hos, Ujjain, Dharwad PTO, Neyyattinkara, Shencottah, Ganjbasoda, Garhakota, Janakpur, Tarana, Angadipuram & Thiruvanthapuram 4 each, Umania, Piravam, Narsingarh, Rehli, Srivaikuntam, Sagar, Khurai, Napoklu, Ashoknagar, Khachrod, Shikaripur, Raisen, Begumganj & Shirhatti 3 each	Hasimara, Pahalgam & Jharnapani AWS 7 each, Barobhisha 6, Majitar, Awantipur IAF, Shopian AWS, Anantnag AWS & Anantnag 5 each, Kulgam AWS, Quazigund & Gangtok 4 each, Tadong, Srinagar AGRO AWS, Gossaigaon, Kukernag, Shalimar AGRO, Khanitar, Srinagar, Tangi, Seppa AWS, Andipatti, Kokrajhar AWS, Kaptipada ARG, Rambagh AWS, GoalparaCwc, Gulmarg, Gyalsing AWS & Gund 3 each	Cherrapunji (Rkm) 11, Cherrapunji 10, Jowai AWS & Kohima 7 each, Mangan, Gokulpur AWS, Amarapur & Udaipur 6 each, Chhamonu, Agartala AP, Shillong AWS, Arundhutinagar, Shillong, Sevoke & Katihar 5 each, Teliamura, Ukhrul AWS, Port Blair, Bihubar, Lumding, Matijuri, Kashinagar, Dholai, Purnea, Mokokchung AWS, Dharmanagar / Panisagar, Kohima AWS, Serchip AWS, Barapani, Aizawal & Sonamura 4 each, Haflong, Madhipura, Hut Bay, Tezu AWS, Gangtok, Kheronighat, Tezu, Khowai, Bishalgarh, Lengpui, Rajmahal, Amraghat, Kamalpur, Kamalpur AWS, Kailashahar, Sabour, Phek, Dillighat, Miao, Aizwal AWS, Khowai AWS, Zunheboto AWS, Silchar, Annapurnaghat, Sahebpur Kanal, Deomali AWS, Bokajan, Neora, Lakhipur, Silchar AP, Sivasagar AWS, Thakurganj & Kodawanpur / C. Bii 3 each
18	Tuting 5	Tezpur 7, Durgapur 6, Uttamapalayam, Dhemaaji AWS & Nilgiri 5 each, SagarIsland AWS, Peraiyur, Jaleswar, Diamond Harbour & Remuna ARG 4 each, Peermade To, Balasore, Durgachak, Mangan, Nh5 Gobindpur, Annapurnaghat, Along AWS, Silchar AP, Aizwal AWS, Baruipur AGRO - AWS, Bhograi & Rajghat 3 each	Cherrapunji (Rkm) 23, Cherrapunji 20, Haflong 13, Panchapatti 8, Rajapalayam, B. P. Ghat, Peraiyur & Srirangapatna 6 each, Jowai AWS, Annapurnaghat & Chauldhowaghat 5 each, Silchar AP, Passighat, Karimganj, Baghmara AWS, Pandavapura & Bhalukpong 4 each, Dhemaaji AWS, Mushalpur AWS, Tangla, Valparai, Mayanur, Valparai Taluk Office, Khowang, Lakhipur, Durgapur, Uttamapalayam, Silchar, Rasipuram, Tamluk AWS, Mohanbari AWS & Dibrugarh AP 3 each
19	Majitar, Dibrugarh AP, Murnadu, Khanitar, Belur, Dholla Bazar & Ambalavayal 3 each	Gobichettipalayam 8, Odagaon ARG 7, Tihidi ARG 6, Perundurai, Jia Bharali N T Xing, Danpur & Korei ARG 5 each, Srungavarapukota, Bonth, Chandbali, Anandpur & Sabla 4 each, Kokrajhar AWS, Gunupur, Jiagaon, Jagannath Prasad ARG, N. Lakhimpur, Goalpara, Barobhisha, Dibrugarh AP, Beki Mathungari, Kalingpong, Thakurmunda, Ghatol, Sattur, Mohanbari AWS, Beky Rly. Bridge, Naharlagun, Drf, Kajolgaon AWS, Balimundali & Bhadrak AWS 3 each	Kailashahar & Dharmanagar / Panisagar 12 each, Yegati 11, Kamalpur AWS 10, Bhadravati 8, Khowai, Jia Bharali N. T. Xing, Chitradurga, Itanagar, Daparijo & Barpeta 7 each, Bargur, Teligi, Naharlagun & Khowai AWS 6 each, Tikrikilla, Karimganj, Chickmagalur, Aie Nh Xing, Beki Mathungari, Udalguri AWS & Barobhisha 5 each, Dudda, Beky Rly. Bridge, Ajjampura R, Gossaigaon, Bahalpur, Kokrajhar, Bihpuria AWS, Namsai, Manash Nh Xing, Bukkapatna, Cooch Behar, Nahar Katia, Tezu AWS, Baghmara AWS, Car Nicobar, Mushalpur AWS & Chepan 4 each, Halebeedu, Dhubri, Magadi, Tezpur, Agartala AP, Pundibari AWS, Port Blair, Chauldhowaghat, Kadur, Tinsukia, Kumargram, Davangere PTO, Tuting, Uchangidurga, Mudigere, Bashirhat, Mathabhanga, Dibrugarh A P, Tarikere, Bhavikere AGRO, Dillighat,

TABLE 5 (Contd.)

Date	March	April	May
			Hosadurga, Mohanbari AWS, Holalkere, Kunigal ARG, Chhamonu, Aizwal AWS, Canning Town, Turuvekere, Dholla Bazar, Basaralu & Tiptur 3 each
20	Kumarakom 7, Batkuli 3	Palasa 16, R. K. Pet 13, Gajoldoba, Cooch Behar & Kotagarh 9 each, Nh5 Gobindpur & Paralakhemundi 8 each, Sholingur, Bhanjnar, Bijapur, Kashinagar & Dhari 7 each, Pathapatnam, Kaptipada ARG, Tusuma & Rajgangpur 6 each, Balasore, Puttur, Gangtok, Pundibari AWS, Jagannath Prasad ARG, Champasari, Baghdogra AP, Kansabati Dam, Patnagarh, Dhari ARG, Annapurnaghat, Suri CWC & Remuna ARG 5 each, Aska, Sonepur, Dantewara, Srungavarapukota, Madhabarida, Rayagada, Tadong, Jowai, Belaguntha ARG, Khaprakhol ARG, Loisingha ARG, Madanpur Rampur, Bangiriposi, Jowai AWS, Bhograi, Digha, Dunguripalli, Nilgiri, Gossaigaon, Sriniketan, Kokrajhar, Lanjigarh & Deesa 4 each, Mandasa, Tekkali, Alipurduar CWC, Belgaon, Cherrapunji (Rkm), Cherrapunji, Rangiya, Gaisilet ARG, Manendragarh, Bankura CWC, Sorada, Moharo, Barhiya, Tikabali, Tirupathi (AGR), Khairamal, Barobhisha, Tantloi, Daringibadi, K. Nuagaon ARG, Kosagumda, Udala, Bolangir, Tarva ARG, Bhopal, Nayagarh, Ranpur, Haflong, Tilpara Barrage, Titlagarh, Panposh, Ichhavar, Koraput, Jeypore, Rajkanika, Khandapara, Jhorigam ARG, Mandira Dam, Venkatapuram, Bakulia, Beky Rly. Bridge, Junagarh, Raikia ARG, Tiring, Kapadvanj, Jagdalpur, Visakhapatnam, Bankura, Soro, Ullunda ARG, Baripada, Joshipur, Palakonda, Kokrajhar AWS, Tangi, Chaibasa, Jalpaiguri & Dabugan ARG 3 each	Maya Bandar 16, Kokrajhar 13, Kosagumda 6, Alathur, Rongo, Gossaigaon, Bahalpur, Punganur & Rampurhat (Drms) 5 each, Cherrapunji, Cherrapunji (Rkm) & Srinivaspur 4 each, Nelamangala, Zunheboto AWS, Bankura, Mannarkad, Panagarh AP, Barpeta, Kolkata AP, Kovai / Koyamutthur, Kovai / Koyamutthur AP, AP Peelamedu, Durgapur, Jowai AWS & Palakkad 3 each
21	Nil	Tiruvuru, Ramnagar & Gadha 7 each, Kothagudam, Eluru, Lawngtlai AWS, Kaikalur & Avaniagadda 6 each, Bhavnagar, Kosagumda, Poonch, Kaiserganj, Gudivada & Sheohar 5 each, Vuyuru AP, Umralla, Dudhi, Baikunthpur, Chintalapudi, Narsipatnam, Chotila ARG, Peddapuram AP & Rapalle 4 each, Tikabali, Dummugudem, Madhira, Vijaywada AP, Talaja, Narsapur, Bansaon, Maharajganj, Venkatapuram, Gorakhpur, Bhimavaram, Jambughoda, Peddapuram, Amalapuram, Gaya AP, Jagdalpur, Baltal AWS, Nandigama & Dhandhuka 3 each	N R Pura 15, Karkala & Rongo 12 each, Sonamura, Udupi & Santebennur 10 each, Channagiri, Sringeri HMS & Jagalur 9 each, Koppa, Irinjalakuda, Palakkad, Kannur, Mudubidre & Ramagiri 8 each, Chitradurga, Davangere, Mulki, Perinthalamanna, B. Durga, Bhadravati, Teliamura & Marandahalli 7 each, Angadipuram, Sukiapokhri, Vadakara, Agumbe, Shivani, Bharamasagara, Udaipur, Gokulpur AWS & Kalyandrug 6 each, Panambur, Kundgol, Poonampet PWD, Devanhalli, Car Nicobar, Port Blair, Kamardi, Yemmiganur & Challakere 5 each, Holalkere, Tadong, Harihar, Ambalavayal, Coonoor, Coonoor PTO, Mudigere, Nagamangala, Bellary, Vaikom, CIAL Kochi, Perumpavur, Arkalgud, Davangere PTO, Hosanagar, Gangtok, Subramanya, Kuppady, Mangalooru, Anjatti, Uchangidurga, Kalingpong, Y N Hoskote, Palacode, Kushal Nagar, Thambalapalli, Udumalpet & Krishnarajpet 4 each, Somwarpet T.O., Irikkur, Teligi, Holenarsipur, Madapur, Bhavikere AGRO, Kovai / Koyamutthur, Bodinaickanur, Konanur, Kottur, Mangan, Idukki, Kozhikode, Naduvattam, Shoolagiri, Halli Mysore, Quilandi, Lingadahalli, Vitla ARG, Manjeri, Car Nicobar IAF, Kibbanahalli, Dharwad Hos, Vythiri, Gadhinglaj, Murnadu, Panchanhalli, Medikeri, Holalur, Kovai / Koyamutthur AWS, Bhagamandala, Thrissur, Mannarkad, Hoskote, Kota, Chintamani, Pavagada, Karwar, Ambur, Ajjampura R, Periyakulam, Pavagada

TABLE 5 (Contd.)

Date	March	April	May
			AWS, Parasurampura, Hut Bay, Mangalapuram, Hosdurg, Kudulu, Bengaluru AP, Enamakal, Sarguru, Tarikere & Sirsi PWD 3 each
22	Numaligarh 7, Itanagar, Haflong & Jia Bharali N T Xing 6 each, Golaghat, Puthimari, Rangiya, Golaghat CWC, Gajoldoba, N. Lakhimpur & Margherita 4 each, Champasari, Naharlagun, Tinsukia, Manash Nh Xing, Khowang, Melabazar / Matunga, Deomali, Dibrugarh AP, Kalingpong, Sivasagar, Majbhat & Dillighat 3 each	Kendrapara, Sirmari B. Pur & Pattamundai 11 each, Derabis ARG 8, Mohammedabad (Y), Chodavaram & Similiguda AWS 7 each, Tenughat & Barrackpur IAF 6 each, Harinkhola, Salur, Bangiriposi, D. P. Ghat, Gariadhar, Bonth & Tusuma 5 each, Bari ARG, Sompeta, Nayagarh, Panagarh AP, Gunupur, Yellamanchili, Bhubaneshwar AP, Kaptipada ARG, Sorada & Bhimunipatnam 4 each, Kashinagar, Bhimavaram, Kalingpong, Rajkanika, Tangi, Krishnagar AWS, Dehra Gopipur, Kharidwar, Pushparajgarh, Kodaikanal, Bhagalpur, Jajpur, Tigiria ARG, Vijayanagaram, Bhanjagar, Marsaghai ARG, Jagdalpur, Hindol, Sahebpur Kanal, Danagadi ARG, Karauli, Kondagaon, Bansur, Berhampur, Mahbubabad, Koraput, Rajahmundry, Tanuku, Madhabarida, Tirtol ARG, Pendra & Thiruvalangadu 3 each	Maya Bandar 17, Long Islands 14, Amraghat 10, Rongo 8, Bagrakote & Port Blair 6 each, Buxaduar, Champasari & Baghdogra AP 5 each, Karanjia & Ghatagaon 4 each, Binjharpur ARG, Rairangpur, Lakhipur, Sonamura, Champai AWS, Neora & Rajghat 3 each
23	N. Lakhimpur & Naharlagun 5 each, Itanagar & Amarpur 3 each	Dhari 12, Dhari ARG 11, Pakala 8, Ghansore & Devarakonda 6 each, Purnea, Tenali, Shihor, Bhuj AP, Narsipatnam, Meghraj & Vinjamur 5 each, Krishnagiri, Minapur, Tirupathi AP, Sahebpur Kanal, Margherita, Muzaffarpur, Lathi & Prathipadu 4 each, Sorada, Sheohar, Malpur, Shoolagiri, Namsai, Rapur, Penucondapuram, Kodawanpur / C. Bii, Umralla, Peddapuram, Sabour, Monghyr, Modasa, Gudivada, Bhagalpur, Rajmahal, Balurghat, Belsand, Jasdhan, Savarkundala ARG, Ariyalur, Manihari, Roing AWS, Kapurthala AWS li & Kajuwala 3 each	Sabour & Baghdogra AP 10 each, Namsai 9, Tuting 8, Sevoke 7, Bhagalpur, Murti, Thali, Rayakottah, Bagrakote & Kollegal 6 each, Golaghat, Neora, Harur, Champasari, Jowai AWS, Kanakapura, Aie Nh Xing, Neamatighat, Avinasi, Sankaridurg, Beky Rly. Bridge & Kaveripakkam 5 each, Gopal Nagar ARG, Golaghat CWC, Tezu AWS, Bihpuria AWS, Bengaluru AP, Bangarpet, Bhalukpong, Badatighat, Chauldhowaghat, Denkanikottai, Kollam Rly, Annur, Alipurduar CWC, Nahar Katia, Rongo, Hosur, Pennagaram, Tezu & Bengaluru CO 4 each, Melabazar / Matunga, Sheohar, Daparijo, Hogenekal, Agartala AP, Varkala, Gajoldoba, Car Nicobar, Zunheboto AWS, Marandahalli, Jalpaiguri, Nagarkata, Kumargram, Guwahati AP, Kolar Gold Field, Yelandur, Tawang AWS, Along AWS, Basar AWS, Neyyattinkara, Basar, Thakurganj & Barpeta 3 each
24	Manali, Saloni, Konni, Seo Bagh, Bhang, Banihal, Jogindarnagar, Ghansore, Srinagar, Palampur, Nainpur, Dalhousie & Katra 4 each, Srinagar IAF, Dharmasala, Kupwara, Udampur IAF, Quazigund, Kangra AP, Bilaspur, Dhundi, Anantnag, Kasol, Nadaun, Sujanpur Tira, Keolari, Jhandutta, Bhuntar AP, Baderwah, Shalimar AGRO, Kukernag, Lakhnadon, Baijnath, Awantipur IAF, Sundernagar, Gulmarg, Barthin, Mandla, Anandpur Sahib, Keylong & Guler 3 each	Kaptipada ARG, Valparai & Valparai PTO 7 each, Valparai Taluk Office & Dabugan ARG 5 each, Paderu, Pathapatnam, Therlam, Seetharampuram, Chodavaram & Pollachi 4 each, Peermade To, Kashinagar, Harur, Bangarpet, Idukki, Thali, Udala, Holenarsipur, Pandavaiyar Head, Hesaraghatta ARG & Halli Mysore 3 each	Jowai AWS 17, Rongo 11, Kumargram & Cherrapunji (Rkm) 8 each, Baghdogra AP & Aie Nh Xing 7 each, Rampurhat (Drms) 6, Cherrapunji, Gajoldoba, Pedong, Kalingpong, Bhalukpong, Manash Nh Xing & Cooch Behar 5 each, Namchi AWS, Bahalpur, Bishalgarh, Kokrajhar AWS, Kochi AP, Bomdila AWS, Pundibari AWS & Amarpur 4 each, Damthang, Namsai, Majitar, Minapur, Champasari, Khanitar, Berhampore, Nh31 Bridge, Agartala AP, Kajolgaon AWS, Sonamura, Namthang, Seppa & Saraiya 3 each
25	Mehre (Barsar) 7, Bhoranj 6, Silchar, Manali, Annapurnaghat, Baijnath & Bhang 5 each, Gohar, Lakhipur, Patsio, Hamirpur, Palampur, Tissa, Dharmasala, Barthin,	Dabaka 7, Savanur & Chitradurga 5 each, Dhamnagar ARG, Rasipuram, Haveri APmc, Yercaud, Shiggaon, Kaptipada ARG & Lakshmeswar 4 each, Sulur, Coonoor, Coonoor PTO, Soro, Konni, Haveri PTO, Venkatagirikota, Kuknoor, Cuttack, K Bridge, Maski, Valparai	Tirupuvanam & Gokulpur AWS 8 each, Udaipur 7, Varkala 6, Basirhat AWS 5, Grand Anaicut & Lalgudi 4 each, Kottayam, Kalingpong, Miao, Berhampore, Tirupathur, Kohima AWS, Kodungallur, Mokochung AWS, Krishnagar AWS, Sonamura & Pullambadi 3 each

TABLE 5 (Contd.)

Date	March	April	May
	Udaipur, R L Bbmb & Nagrota Surian 4 each, Dhundi, Keylong, Sujampur Tira, Jhandutta, Nangal, Amraghat, Jogindarnagar, Deoprayag, Baldwara, Arki & Saloni 3 each	Taluk Office, Kavital, Kanjirappally, B. Durga, Badami, Chitaguppa, Udala, Periyanaickenpalayam & Madavaram AWS 3 each	
26	Sholavandan 9, Periyakulam & Vadipatti 8 each, Ayikudi, Shencottah, Thenkasi, Peraiyur, Usilampatti & Lakhipur 7 each, Rajapalayam 6, Srivilliputhur & Parumbikulam 5 each, Punalur, Palayamkottai, Silchar, Annapurnaghat, Kanyakumari & Mancompu 4 each, Kozha, Namsai, Bodinaickanur, Sankarankoil, Aryankavu, Peermade To & Varkala 3 each	Banswada, Kaladgi, Saundatti S.F. & Ron 7 each, Mundali, Shirol, Wardha & Honnali 6 each, Shikaripur, Mettupatti, Kunderagi ARG, Gadag, Bilgi (Irri.), Hirekerur, Ramagundam, Chikodi, Hungund, Zalki Cross & Thodupuzha 5 each, Akkalkot, Haveri APmc, Dambal, Ramdurga, Hunchadakatte, Babaleshwar, Holalagunda, Rabkavi, Mundargi, Hatkanangale, Bydgi, Hangal, Bhokar & Kerur 4 each, Jamakhandi ARG, Aryankavu, Bellatti, Devala, Tandur, Alamatty HMS, Pathri, Hosanagar, Tasgaon, Hingoli - Hyd, Akhuapada, Bijapur, Tandur AP, Alur, Bhoothapandy, Guledgund, Jamkhandi, Almel ARG, Bhagamandala, Lokapur Phc, Banavasi, Mangalvedha, Lakshmeswar, Kalasa, Kodangal, Bidar, Tikkota, Afzalpur HMS, Athani ARG, Shirhatti, Paramathivelur, Aland, Madurai South, Nippani & Shiralkoppa 3 each	Maya Bandar 24, Port Blair 20, Quilandi & Vadakara 14 each, Alappuzha 10, CIAL Kochi, Tirupuvanam & Kumarakom 8 each, Long Islands 6, Pullambadi, Mancompu, Konni, Vadakkancherry & Kozhikode 5 each, Mannarkad, Baramulla AWS, Irikkur & Trichy town 4 each, Tirumayam, Kodungallur, Chamarajnar, Nh31 Bridge, Chengannur, Tirupathur, Erode, Devala, Baltal AWS, Lalgudi, Perambalur, Pedong, Nancowry, Udupi & Kupwara 3 each
27	Thodupuzha 6, Kanjirappally 5, Vaikom 4, Ambalavayal, Holenarsipur, Kottayam, Chengannur, Kuppady & Piravam 3 each	Maya Bandar 9, Cherrapunji 7, Thalasserry & Dharmasthala 6 each, Alipurduar CWC, Uppinagadi, Hassan, Cherrapunji (Rkm), Mathabhanga, Hindol, Mohana, Dhubri CWC, Barobhisha, Parjang ARG & Tiruttani 5 each, GoalparaCwc, Dhubri, Kalasa, Sulya ARG, Cooch Behar & Tikrikilla 4 each, Mudubidre, Chepan, Long Islands, Pundibari AWS, Hunsur Tb, Turuvekere, Mananthavady, Vadakara, Raikia ARG, Phiringia ARG, Hosdurg, Tondi & Keonghargarh 3 each	Hut Bay 16, Harur & Tozhudur 13 each, Sevoke 11, Batote 10, Subramanya 9, Baltal AWS 8, Dharmapuri, Dharmapuri PTO, Gulmarg AWS, Dhone, Udampur IAF, Chengam, Port Blair & Uchangidurga 7 each, Pallahara, Gulmarg, Arani, Kukernag, Murnadu, Hadagalli, Baderwah, Panambur & Barur 6 each, Ramnagar, Polur, Belthangady, Holalur, Banihal, Chandanwari AWS, Channagiri, Teligi, Darjeeling, Quazigund, Holenarsipur, Ambur & Vaniaymbadi 5 each, Anandpur, Gunupur, Anantnag AWS, Baliguda, Krishnagiri, Cuttack, Messenjore, Alur, Baramulla AWS, Kuppam, Rayachoti, Tirupattur, Tirupathur PTO, Kampli, Davangere, Chintapalli, Shillong AWS, Shillong, Chhamonu, Pahalgam, Udupi, H Dkote & Bhuban ARG 4 each, Saraiya, Kalavai AWS, Enamakkal, Prathipadu, Talcher, Irikkur, Neora, Bharamasagara, Zunheboto AWS, Kulgam AWS, Car Nicobar, Harihar, Harapanahalli, Chauldhowaghat, Pahalgam AWS, Shopian AWS, Rayakottah, Tirukoilur, Davangere PTO, Vaishali, Bomdila AWS, Atabira ARG, Gorsoppa, Bhavikere AGRO, Arkalgud, Rengali, Gangavati HMS, Jenapur, Kupwara, Muzaffarpur, Srinagar AGRO AWS, Shalimar AGRO, Piravam, Uthangarai, Chapra, Rambagh AWS, Motihari, Srinagar, Teliamura, Digapahandi ARG, Raikia ARG, Harran AWS, Jujumura ARG, Anantnag, Alangayam, Chengalpattu, Bellary AWS, Bhubaneshwar AP, Gund & Samakhunta AWS 3 each
28	Naduvattam 4, Punalur & Chittur 3 each	Goalpara Cwc & Goalpara 7 each, Jalpaiguri, Mathabhanga, Joida & Gossaigaon 5 each, Ramanathapuram, Alipurduar CWC, Kailashahar, Belgaum (Sambra), Aie Nh Xing, Kajolgaon AWS, Amraghat, Jhumpura, Roing AWS & Manash Nh Xing 4 each, Balurghat, Dhubri CWC, Dharmanagar / Panisagar, Barobhisha, Sulya, Digboi, Kokrajhar AWS, Khowai AWS, Domohani, Dhubri, Belonia, Tikrikilla, Aizwal AWS, Agartala A P, Teliamura, Kozha,	Maya Bandar & Gokarna 9 each, Kokrajhar & Amini Divi 8 each, Mudhol R & Bailhongal 7 each, Yercaud, Dharmapuri, Dharmapuri PTO, Kirwati & Jagatsinghpur AWS 6 each, Alipingal, Kumta & Kudachi 5 each, Chikkanahalli PTO, Karwar, Udalguri AWS, Marandahalli, Meerath, Jammu, Long Islands, Ghatagaon, Dholla Bazar, Nangal, Savanur, Rayakottah, Valpoi, Rabkavi, Honakere, Bomdila AWS, Manvi, Kunnamkulam, Nuagada ARG, Tuting & Mahendragarh 4 each, Falakata, Rajmahal, Kamalpur, Kamalpur AWS,

TABLE 5 (Contd.)

Date	March	April	May
		Arundhutinagar, Chhamonu, Jharnapani, Guwahati AP & Sonamura 3 each	Gyalsing AWS, Sholavandan, Mugud ARG, Kollegal, Agathi, Krishnagiri, Tadong, Harihar, Hut Bay, Marmugoa, Tawang AWS, Jammalamadugu, Arundhutinagar, Padalur, Peermade To, Siddapur, Cherrapunji (Rkm), Ponnani, Mokochung AWS, Islampur, Raiganj AWS, Namchi AWS, Daringibadi, Ranebennur Hos, Subramanya, Dharwad PTO, R L Bmb, Dibrugarh AP, Agartala AP, Yadwad, Chittapur, Mohanbari AWS, Dharwad Hos, Barpeta, Deogaon, Bydgi, Puri, Athni, Sivasagar, Ajjampura R, Shirali, Jhorigam ARG, Hangal, Nelogi, Gangtok, Beky Rly.Bridge, Castle Rock, Saintala ARG, Chhachhrauli, Naraingarh & Kadur 3 each
29	Odagaon ARG 5, Talcher & Manendragarh 3 each	Hosdurg, Jorhat, Jorhat AWS & Begur 9 each, H Dkote 7, Gangtok, Coonoor & Coonoor PTO 6 each, Chalakudi, Thali, Chatrapatti (Odanchatra), Cherrapunji (Rkm), Kundapura, Kumarakom & Valparai Taluk Office 5 each, Thodupuzha, Piravam, Kozha, Cherthala, Vaikom, Udupi, Bodinaikkanur, Honnali, Gyalsing AWS, Sulya, Sulya ARG & Challakere 4 each, Belthangady, Mananthavady, Cherrapunji, Madakasira, Gooty, Thalavadi, Periyakulam, Uchangidurga, Udumalpet, Idukki, Mudigere, Teligi, Srirangapatna, Kanjirappally, Tadong, Harapanahalli, Arasalu, Ambalavayal, Goalpara Cwc, Hounsabhavi, Gundlupet ARG & Kollamkode 3 each	Agumbe 14, Enamakkal 11, Rayalpadu 10, Bihpuria AWS & Nilkund ARG 9 each, Gorsoppa 8, Mapusa, Holalkere & Falakata 7 each, Kumargram, Bydgi, Badami, Hatkanangale, Devarkonda & Thrissur 6 each, Hunchadakatte, Naharlagun, Panjim (Goa), Siddapur, Koppa, Vengurla, Utukuru AP, Kodungallur, Nahar Katia, Halebeedu, Maya Bandar, Gaganbawada, Ron, Pakala, Ketti & Buxaduar 5 each, Tavaregere, Kagal, Pennagaram, Gudiyatham, Dambal, Shoolagiri, Kadur, Ranebennur Hos, Itanagar, Barpeta, Sravanabelagola, Kota & Malvan 4 each, Panbari, Mangalooru, Barur, Guwahati AP, Kundapura, Pernem, Nilkund, Davangere PTO, Yegati, Walva Islampur, Avathi ARG, Chikodi, Tuting, Alangudi, Lokapur Phc, Manchikere, Guttal, Kunnamkulam, Neora, Sevoke, Siddapura, Siddapura ARG, Hagaribommanahalli, Holalur, Daparajo, Melalathur, Margao, Kollapur, Anavatti, Chickmagalur, Chepan, Sanguem, Sringeri HMS, Nelamangala, Venkatagirikota, N R Pura, Tiruvannamalai, Aluva PWD, Perumpavur, Humnabad, Bhagamandala, Gandarvakottai, Irinjalakuda, Dholai, Dharwad Hos, Lakkireddipalam, Khanapur, N. Lakhimpur, Balehonnur, Kalwakurthi, Uppinagadi & Neamatighat 3 each
30	Hamirpur 5, Periyar & Chauldhowaghat 4 each, Bhoothapandy, Dholla Bazar, Tinsukia & Kandaghat 3 each	Mokochung AWS 9, Koilkuntla & Agartala AP 5 each, Bishalgarh & Zunheboto AWS 4 each, Deomali, Itanagar, Arundhutinagar, Mahendragarh, Car Nicobar, Gangtok, Khowai, Kalugumalai & Tadong 3 each	Contai 26, SagarIsland AWS 17, Gajoldoba 13, Rajghat & Kalaikunda 12 each, Kharagpur (I.I.T.), Sevoke, Jamsolaghat & Dhamnagar ARG 11 each, Cherrapunji (Rkm) 10, Udalguri AWS, Bangiriposi, Rairangpur, Baripada, Jaleswar, Cherrapunji, Samakhunta AWS, Karimganj & Kalghatgi 9 each, Kakkeri, Soro, Kansabati Dam, Basudevur AWS, Beki Mathungari, Digha, Phulberia, Midnapore CWC, Pattamundai, Kalghatgi ARG, Nagarkata & Chandbali 8 each, Bhimarayanagudi ARG, Chandanpur, Jaipur, Chandipur AWS, Bagrakote, Gokak, Darjeeling, Midnapore, Tihidi ARG, Udala, Champasari, Tusuma, Addanki, Nh5 Gobindpur, Paradip, Betanati ARG, Murti, Damthang, Namchi AWS, Nilgiri, Piravam, Kharidwar, Purihansa & Durgachak 7 each, Chengmari / Diana, Gyalsing AWS, Udupi, D. P. Ghat, Bhadrak AWS, Balasore, Neora, Goalpara Cwc, Jagatsinghpur AWS, Diamond Harbour & Bankura CWC 6 each, Bhograi, Rajkanika, Kalingpong, Durgapur, Joshipur, Jowai AWS, Deodurg, Jeewargi, Bashirhat, Alipingal, Falakata, Gangtok, Pedong, Bankura, Remuna ARG, Kudal, Raichur, Rampurhat (Drms), Mohanpur, Khanitar, Panagarh AP, Bonth, Raichur AGRO, Chepan, Bomdila AWS, Tiring & Singla Bazar 5 each, Vythiri, Majitar, Canning Town, Suri CWC, Asansol CWC, Harinkhola, Jamshedpur, Gadhinglaj, Alipurduar CWC, Mohanpur, Messenjore, Tawang AWS, Kottayam, Jamshedpur AP, Kochi AP, Shillong AWS, Nongstain AWS, Kumargram, Kaptipada

TABLE 5 (Contd.)

Date	March	April	May
			ARG, Metpalli, Shillong, Dharwad PTO, Tadong, Hidkal Dam, Buxaduar, Akhuapada, Balimundali, Kota, Rajmahal, Hukkeri & Sriniketan 4 each, Kailashahar, Sindhanur, Kampli, Gudiyatham, Barrackpur IAF, Shahpur, Bailhongal, Guwahati AP, Barobhisha, Maithon, Along AWS, Jalahalli, Nuzvidu, Chinsura AWS, Putki, Manihari, Nilkund, Kheronighat, Arabhavi ARG, Lumding, Barapani, Shorapur, Kolkata AP, Yemmiganur, Domohani, Krishnagar AWS, Baruiapur AGRO - AWS, Gulbarga AWS, Gossaigaon, Baghdogra AP, Barmul, Kunigal ARG, Mangan, Berhampore, Tilpara Barrage, Derabis ARG, Anandpur, Puthimari, Kokrajhar AWS, Hasimara, Jenapur, Belsand, Karipur, Lengpui, Tirtol ARG, Kodungallur, Ponda, Kolkata, Vengurla, Aizwal AWS, Kendrapara, Nischintakoili ARG, Dharwad Hos, Ghatagaon, Maski, Kozha, Port Blair, Gheropara, Tavaregere, Rangiya & Atchempet 3 each
31	Maddur, Tinsukia, Gangtok, Nil Uttar Kashi & Magadi 3 each		Kansabati Dam 41, Tusuma 24, Purihansa 21, Phulberia & Kharidwar 19 each, D. P. Ghat, Saraiya & Darjeeling 17 each, Simula 16, Tiring 14, Jamshedpur AP, Midnapore & Mohanpur 13 each, Rairangpur, Midnapore CWC & Motihari 12 each, Jamshedpur, Gajoldoba & Bankura CWC 11 each, Sukiapokhri, Jammu, Sevoke, Canacona, Bankura, Bangiriposi & Kudulu 10 each, Marsrakh, Patna AP, Vaishali, Gaya AP, Islampur, Chapra, Muzaffarpur, Hisua & Margao 9 each, Bagrakote, Mahedi / Mehshi, Alangayam, Marhaura, Chakia, Belthangady, Koratagere, Kunigal, Kharagpur (I.I.T.), Jhorigam ARG & Chandahandi ARG 8 each, Tumkur, Champasari, Quepem, Mohanpur, Kodavasal, Damthang, Uppinagadi, Muthupet, Sono & Port Blair 7 each, Manihari, Murnadu, Buxaduar, Hessarghatta, Sirsi PWD, Singla Bazar, Sanguem, Dharmasthala, Uchangidurga, Makhdumpur & Tirupathur 6 each, Kalingpong, Taliparamba, Hesaraghatta ARG, Asansol CWC, Hassan, Bhavani P., Araria, Nannilam, Durgapur, Neora, Hasimara, Majitar, Barhiya, Jaleswar, Palacode, Perinthalamanna, Baghdogra AP, Khanitar, Chittampatti & Mangalooru AP 5 each, Hukkeri, Murti, Panagarh AP, Thyagarathi, Barobhisha, Subramanya, Chepan, Hathwa, Pedong, Tentulikhunti ARG, Bihar, Kumargram, Chilamattur, Pochampalli, Thiruthuraipoondi, Ajjampura R, Balimundali, Srirampura, Chidambaram AWS, Chengmari / Diana, Bhagamandala, Kozhikode, Minicoy, Bhagalpur, Basaralu, Navalgund, Solapur, Nagarkata, Betanati ARG, Thuvakudi Imti, Trangambadi (Or) Tranqueb, Devanhalli & Vadakara 4 each, Gangtok, Hogenekal, Suri CWC, Nawarangpur, Sahebganj, Tarikere, Alipurduar CWC, Doddaballapura, Tadong, Chaibasa, Tantloi, Shivani, Jalpaiguri, Madhipura, Kodawanpur / C. Bii, Mannargudi, Kunnamkulam, Tiruchirapalli AP, Jayapura, Bengaluru CO, Cooch Behar, Honavar, Melur, Sethiathope, Ponnani, Sabour, Bareilly, Hut Bay, Siddapura, Mandya, Pandavaiyar Head, Jamsolaghat, Gowribidanur, Kota, C N Halli, Tiruvannamalai, Gheropara, Chidambaram, Shoolagiri, Vilupuram, Upper Anaicut, Tilpara Barrage, Nh31 Bridge, Koraput, Akkalkot, Murliganj, Shirali, Manchikere, Contai, Mettupatti, Samayapuram, Gubbi, Holalkere, Bhavikere AGRO, Vadakkancherry, Ranebennur Hos, Mathabhanga & Panchanalli 3 each

Night temperatures were generally below to appreciably below normal over parts of Central and east India during the first week of the month because of the presence of anomalous High pressure region over central parts of the country. During the remaining weeks it was *normal/above normal* on many days over the country except over peninsular India.

The month's and the season's lowest minimum temperature over the plains was 4.9° C, recorded at Adampur (Punjab) on 1 March, 2013.

(ii) *Maximum temperatures*

Heat wave conditions prevailed on 3 days in some parts of Assam & Meghalaya and on 1 day each in Arunachal Pradesh and Konkan & Goa.

Hot Day conditions prevailed on 6 days in Saurashtra & Kutch; 3 days in some parts of Konkan & Goa and on 1 day in coastal Karnataka. The presence of the anti cyclone over the central parts of the country had offsetting effects of the sea breeze which caused the regions along the coasts of Maharashtra and Gujarat to remain warmer than normal by 6-7 °C during afternoon hours.

Day temperatures were generally *above/appreciably above normal* during the first fortnight of the month in almost in all sub-divisions on most of the days except over Peninsular India (barring coastal Karnataka). During the second fortnight, the day temperatures were generally normal except for a few days in parts of northwest, east & northeast India.

The month's highest maximum temperature over the plains was 42.0° C, recorded at Bhira (Konkan & Goa) on 8 March, 2013.

3.1.3. *Disastrous weather events and damage*

According to media and other disaster reports, avalanche/Landslide claimed 10 lives in Uttarakhand and 4 in Kashmir valley. Thunderstorm/lightning related incidents claimed 12 lives in Madhya Pradesh, 9 each in West Bengal, Uttar Pradesh and Andhra Pradesh, 4 in Odisha, 3 in Punjab, 2 each in Assam & Karnataka and 1 in Kerala. Twelve deaths and extensive damage to crops like wheat Gram and Mangroves were reported in Madhya Pradesh. Two deaths due to cold wave and 1 due to heat wave were reported from Rajasthan & Andhra Pradesh respectively.

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.

North-south troughs/wind discontinuities caused *scattered to widespread* thundershower activity over central and peninsular parts of India. However, the feeble nature of the system caused the realized rainfall to remain well below normal during the month. Quick passage of western disturbances caused precipitation at *scattered/isolated places* over western Himalayan region and adjoining states. Northeastern states also received *widespread* rainfall with *heavy* rainfall at isolated places during the third week and *scattered/isolated places* during the remaining weeks of the month.

3.2.2. *Temperature distribution*

Severe heat wave conditions prevailed on 3 days in some parts of Saurashtra & Kutch and on 1 day in some parts of east Uttar Pradesh and Coastal Andhra Pradesh. *Heat wave* conditions prevailed on 2 days in east Uttar Pradesh and Vidarbha and on 1 day each in Assam & Meghalaya and Gangetic West Bengal.

Occurrence of convective rainfall activity kept the day maximum temperatures *normal/ below normal* over major part of India at the beginning of the month and then the heating of landmass took place steadily and *above normal/appreciably normal* temperatures prevailed over central and northern parts of India during the first half of April. During the second half, *scattered to wide spread* thundershower activity caused the day temperatures to remain *below normal* over major part of India in the initial half and then *above normal/appreciably above normal* temperatures prevailed over central and eastern parts of India towards the end of the month.

The month's highest maximum temperature over the plains was 47.6° C recorded at Chandrapur (Vidarbha) on 28 April, 2013.

3.2.3. *Disastrous weather events*

According to media and other disaster reports, thunderstorms / thunder squall / lightning / hailstorm / heavy rain/Avalanche/Landslide claimed 128 lives in Andhra Pradesh, 26 in West Bengal, 18 in Maharashtra, 13 each in Odisha and Madhya Pradesh, 10 in Chhattisgarh, 9 in Uttar Pradesh and Karnataka, 8 in Assam, 6 in Jharkhand, 5 each in Jammu & Kashmir and Tamil Nadu, 3

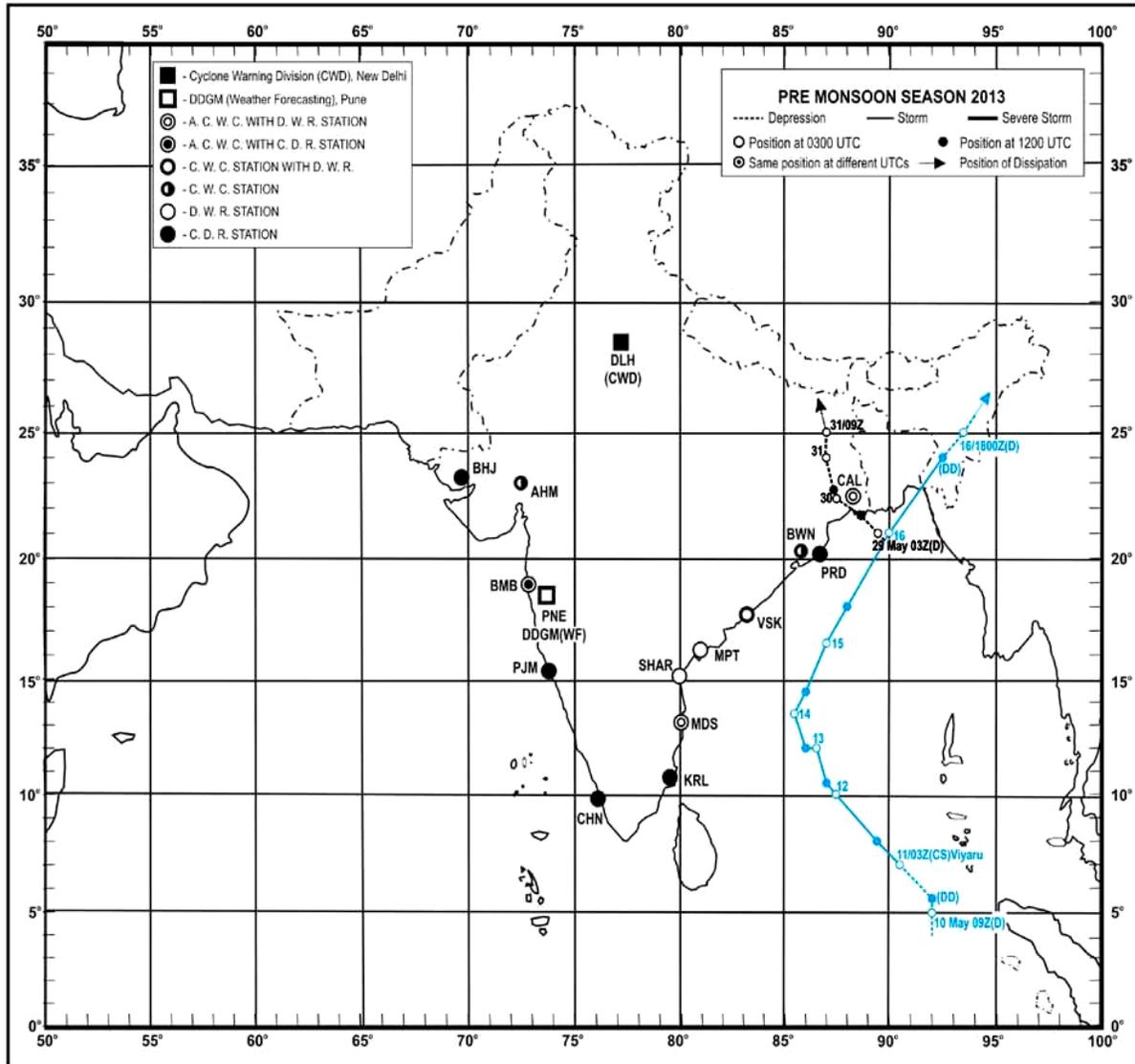


Fig. 2. Cyclones and Depressions during Pre-Monsoon Season 2013

in Meghalaya, 2 in Kerala and 1 each in Tripura, Himachal Pradesh and Gujarat. Heat wave claimed 5 lives in Maharashtra and 1 each in West Bengal, Odisha, Andhra Pradesh and Kerala. Apart from claiming 18 lives the high velocity winds accompanied with rain and lightning rendered thousands of families homeless in 30 villages and uprooted hundreds of trees, telephone and electric poles in West Bengal. Hailstorm in Andhra Pradesh which claimed 60 lives caused extensive damage to houses and crops in about 18000 hectares.

3.3. May

3.3.1. Weather and associated synoptic features

(i) Advance of southwest monsoon

The formation of Cyclonic Storm Viyaru (10 - 16 May) aided the advance of southwest monsoon over some parts of southeast Bay of Bengal and of Andaman Sea on 17th May. The SW monsoon further advanced into some

parts of southwest Bay of Bengal, some more parts of southeast Bay of Bengal and of east central Bay of Bengal and entire Andaman Sea on 20 May, some more parts of southeast and east central Bay of Bengal on 26, some more parts of southwest and east central Bay of Bengal, remaining parts of southeast Bay of Bengal and some parts of west central and northeast Bay of Bengal on 27 and further advanced into some parts of southeast Arabian Sea, Maldives-Comorin area and some parts of southwest Bay of Bengal on 31.

(ii) *Other synoptic features and rainfall*

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

The formation of cyclonic storm (Viyaru) in the Bay of Bengal during the month caused *scattered to widespread* rainfall over northeastern sub divisions during first half of May. The advancement of southwest monsoon and the formation of Depression (29-31 May), rainfall activity increased overall towards the end of the month over eastern or in eastern and northeastern states. Tracks of these intense low pressure systems are given in Fig. 2.

3.3.2. *Temperature distribution*

Severe heat wave conditions prevailed on 6 days in some parts of Punjab and 1 to 4 days in some parts of Odisha, Haryana, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, and coastal Andhra Pradesh. *Heat wave* conditions prevailed on 21 days in some parts of Vidarbha and 15 days in coastal Andhra Pradesh; 11 to 14 days in some parts of Odisha and east Madhya Pradesh, 5 to 10 days in some parts of Uttar Pradesh, Haryana, west Rajasthan, west Madhya Pradesh, Chhattisgarh and Tamil Nadu and on 1 to 4 days in some parts of Assam & Meghalaya, Gangetic West Bengal, Jharkhand, Punjab, Jammu & Kashmir, east Rajasthan, Madhya Maharashtra, Marathwada and Telangana.

The day temperatures were mainly *normal/above normal* outside northeastern sub-divisions during first half of May. It was *appreciably above/ markedly above normal* over northwest, central and parts of Peninsular India for most of the days during second half of May.

The month's as well as the season's highest maximum temperature of 48.6°C was recorded at Ganganagar (west Rajasthan) on 23 May 2013.

3.3.3. *Disastrous weather events and damage*

According to media and other disaster reports, hailstorm / thunderstorm / lightning / heavyrain / floods / Landslide / dust storm related incidents claimed 24 lives in West Bengal, 20 in Odisha, 19 in Bihar, 17 in Mizoram, 12 in Andhra Pradesh, 8 in Assam, 6 each in Jharkhand & Kerala, 5 in Tamil Nadu, 3 in Jammu & Kashmir, 2 in Sikkim and 1 each in Andaman & Nicobar Islands and Meghalaya. *Severe heat wave/Heat wave* claimed 440 lives in Andhra Pradesh, 6 each in Jharkhand and Punjab, 5 in Uttar Pradesh, 4 in West Bengal, 3 each in Odisha and Madhya Pradesh and 2 each in Haryana and Kerala.

Appendix

Definitions of the terms given in 'Italics'

Temperatures

(a) *Maximum/ day temperatures*

According to the criteria being followed since 1st March 2002, Heat Wave will be declared only when the maximum temperature of a station reaches at least 40° C for plains and at least 30° C for Hilly regions.

Severe heat wave - Departure of maximum temperature from normal is + 6° C or more for the regions where the normal maximum temperature is more than 40° C and departure of maximum temperature from normal is + 7° C or more for the regions where the normal maximum temperature is 40° C or less.

Heat wave conditions - Departure of maximum temperature from normal is between + 4° C to + 5° C or more for the regions where the normal maximum temperature is more than 40° C and departure of maximum temperature from normal is +5° to + 6° C for the regions where the normal maximum temperature is 40° C or less.

Hot day conditions - Whenever the maximum temperature remains 40° C or more and minimum remains 5° C or more above normal, provided, it is not satisfying the heat wave criteria.

(b) *Minimum/night temperatures**Severe cold wave conditions*

Departure of WCTn from normal minimum temperature is -7°C or less for the regions where normal minimum temperature is $> 10^{\circ}\text{C}$ and -6°C or less elsewhere.

Excess

- Percentage departure from normal is $+ 20\%$ or more.

Cold wave conditions

- Departure of WCTn from normal minimum temperature is from -5°C to -6°C where normal minimum temperature is $\geq 10^{\circ}\text{C}$ and from -4°C to -5°C elsewhere.

Normal

- Percentage departure from normal is -19% to $+ 19\%$.

Deficient

- Percentage departure from normal is -20% to -59% .

Also cold wave is declared when WCTn is $\leq 0^{\circ}\text{C}$ irrespective of the normal minimum temperature for those stations.

Scanty

- Percentage departure from normal is -60% to -99% .

Rainfall
