MAUSAM, **59**, 2 (April 2008), 247-272

Weather in India

HOT WEATHER SEASON (March – May 2007)*

1. Chief features

(*i*) The hot weather season of 2007 witnessed formation of one Cyclonic Storm 'Akash' (13-15 May) and a Depression (3-5 May) over the Bay of Bengal.

(*ii*) Cold wave conditions prevailed on a few days during first fortnight of March 2007 over J & K, H. P., Uttarkhand and east U. P. The heat wave conditions manifested over various parts at the end of March.

(*iii*) Enhanced rainfall/snowfall activity was observed in the month of March over northwest India due to the activity of western disturbances.

(*iv*) The onset of southwest monsoon took over Kerala on 28 May. By the end of the season, the monsoon had covered some parts of coastal & south interior Karnataka and Tamil Nadu.

2. Seasonal rainfall

Season's rainfall was: *excess*† in 5 meteorological sub-divisions *viz.*, east Uttar Pradesh, west Uttar Pradesh, Haryana, Chandigarh & Delhi, Punjab, west Rajasthan, *normal* in 11 *viz*., Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Orissa, Jharkhand, Uttarakhand, Himachal Pradesh, Jammu & Kashmir east Madhya Pradesh and Kerala *deficient* in 16 *viz.*, Arunachal Pradesh, Assam & Meghalaya, Bihar, east Rajasthan, west Madhya Pradesh, Konkan & Goa, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Telangana, Rayalaseema, Tamil Nadu[3], coastal Karnataka, north interior Karnataka, south interior Karnataka, and Lakshadweep and *scanty* in the remaining 4 sub-divisions *viz*., Gujarat Region[2], Saurashtra & Kutch, Madhya Maharashtra and Marathwada. Actual rainfall and its departures for each month and season as a whole are given in Table 1. Also the sub-divisional rainfall departures for the season March-May 2007 are depicted in Fig. 1.

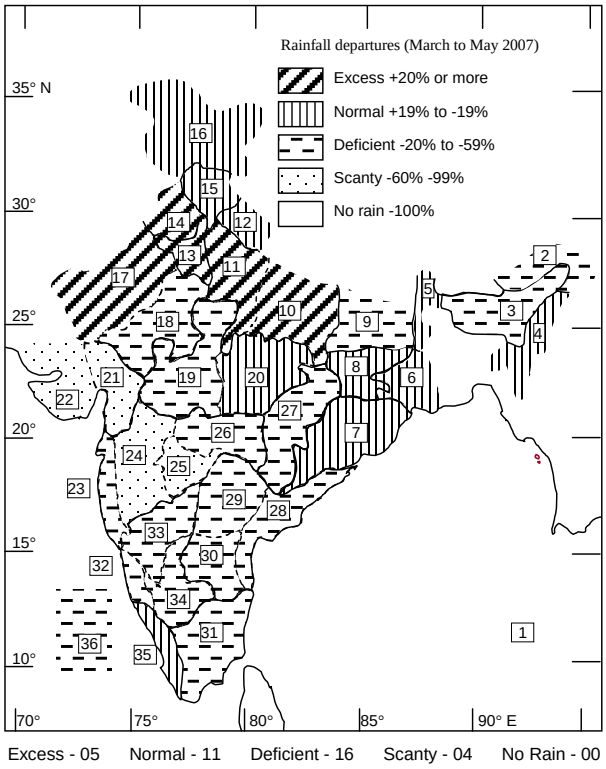

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for the period (March - May 2007). 36 Sub-divisions are indicated by numbers on the map & bold letters in legend below. The rainfall anomaly values for these sub-divisions are indicated below :

1	–7	**7**	–17	**13**	113	**19**	–21	**25**	–94	**31**	–22
2	–26	**8**	–7	**14**	31	**20**	–9	**26**	–25	**32**	–40
3	–31	**9**	–21	**15**	–11	**21**	–99	**27**	–39	**33**	–44
4	–9	**10**	67	**16**	8	**22**	–92	**28**	–33	**34**	–30
5	–6	**11**	68	**17**	26	**23**	–48	**29**	–47	**35**	–17
6	0	**12**	11	**18**	–35	**24**	–90	**30**	–34	**36**	–30

3. Significant features during various months

3.1. *March*

3.1.1. *Weather and associated synoptic features*

Details of the weather systems during the month are summerised in Table 2. The principal amounts of rainfall are given in Table 5.

* Meaning of terms in italics other than subtitles is given in Appendix.

[2] The Sub-division Gujarat Region, Daman, Diu & Nagar Haveli is shortened as Gujarat Region and

[3] Tamil Nadu & Puducherry as Tamil Nadu throughout the article

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TABLE 1

Sub-divisionwise rainfall (mm) for each month and season as a whole (March - May 2007)

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	13	19	–29	55	69	–20	360	373	–4	429	461	–7
2.	Arunachal Pradesh	53	158	–67	274	277	–1	202	285	–29	529	719	–26
3.	Assam & Meghalaya	24	84	–71	236	201	17	212	396	–46	473	681	–31
4.	Nagaland-Manipur-Mizoram-Tripura	25	65	–61	172	149	15	206	229	–10	403	443	–9
5.	Sub-Himalayan West Bengal & Sikkim	38	55	–31	145	117	24	221	259	–14	404	430	–6
6.	Gangetic West Bengal	38	27	39	36	46	–22	93	93	0	167	167	0
7.	Orissa	9	25	–64	23	36	–37	68	60	15	100	121	–17
8.	Jharkhand	17	19	–11	16	21	–26	47	46	3	79	86	–7
9.	Bihar	19	11	69	10	19	–45	38	55	–31	67	85	–21
10.	East Uttar Pradesh	25	10	167	3	6	–53	27	17	53	55	33	67
11.	West Uttar Pradesh	36	11	212	1	5	–82	12	13	-4	49	29	68
12.	Uttarakhand	105	59	76	18	35	–49	51	62	–17	174	157	11
13.	Haryana, Chandigarh & Delhi	49	13	264	2	7	–74	22	14	61	73	34	113
14.	Punjab	57	27	115	6	12	–48	8	16	–51	71	54	31
15.	Himachal Pradesh	174	115	52	9	66	–86	37	66	–44	220	247	–11
16.	Jammu & Kashmir	280	161	73	13	97	–87	66	75	–11	359	332	8
17.	West Rajasthan	17	4	346	1	3	–57	3	10	–67	21	17	26
18.	East Rajasthan	8	4	105	1	3	–51	2	11	–82	11	17	–35
19.	West Madhya Pradesh	4	5	–28	1	2	–46	7	7	–9	11	14	–21
20.	East Madhya Pradesh	12	14	–14	2	6	–60	11	8	39	25	28	–9
21.	Gujarat region	0	1	–98	0	1	–100	0	6	–99	**	9	–99
22.	Saurashtra & Kutch	**	1	–94	**	1	–73	0	2	–100	**	5	–92
23.	Konkan & Goa	0	**	–100	1	4	–60	19	36	–46	21	40	–48
24.	Madhya Maharashtra	0	3	–100	3	10	–75	2	28	–94	4	41	–90
25.	Marathwada	0	6	–99	1	7	–86	1	21	–95	2	33	–94
26.	Vidarbha	8	12	–33	9	8	11	7	11	–41	24	31	–25
27.	Chattisgarh	7	16	–54	5	17	–67	20	21	–5	33	53	–39
28.	Coastal Andhra Pradesh	1	13	–92	16	22	–28	46	60	–23	63	94	–33
29.	Telangana	**	10	–99	13	17	–20	16	29	–45	29	56	–47
30.	Rayalaseema	0	7	–100	14	18	–20	37	54	–31	51	78	–34
31.	Tamil Nadu	1	19	–95	55	43	30	44	67	–35	100	129	–22
32.	Coastal Karnataka	1	4	–74	29	27	5	77	148	–48	107	179	–40
33.	North interior Karnataka	1	6	–88	13	26	–48	35	56	–38	49	88	–44
34.	South interior Karnataka	2	9	–81	25	44	–42	77	97	–20	105	150	–30
35.	Kerala	8	38	–79	143	122	18	203	268	–24	354	428	–17
36.	Lakshadweep	0	13	–100	17	43	–61	147	178	–17	164	234	–30

** Indicates amounts between 0.1 to 0.4 mm. (Amounts less than 0.1 is rounded off to 0)

TABLE 2

Details of the weather systems during March 2007

S. No.	System	Duration	Place of first location	Direction of movement	Final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Western disturbances /Eastward moving systems*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Upto mid tropospheric levels	2 – 4	Northeast Afghanistan and adjoining Pakistan	Northeast	Northern parts of Jammu & Kashmir	Moved away on 5
2.	Do	8 – 14	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Moved away on 15
3.	Do	14 – 19	Northeast Afghanistan and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away on 20
4.	Do	19 – 22	Do	Do	Jammu & Kashmir and neighbourhood	Moved away on 23
5.	Do	30 Mar – 2 Apr	North Pakistan and neighbourhood	Do	Northern parts of Jammu & Kashmir	Moved away on 3 April
(*ii*)	*As an induced cyclonic circulation*					
1.	Upto mid tropospheric levels	9 – 13	Central Pakistan and adjoining Punjab	Northeast	Haryana and neighbourhood	Less marked on 14
2.	Do	10 – 12	East Rajasthan	Do	Central parts of Madhya Pradesh	Less marked on 13
3.	Do	14	Punjab and neighbourhood	Do	Uttarakhand and neighbourhood	Less marked on 15 evening
4.	Do	19 – 21	Punjab and neighbourhood	Do	Do	Less marked on 22
5.	Do	21 – 23	Northwest Rajasthan and adjoining Punjab	Do	Punjab and neighbourhood	Less marked on 24
(**B**)	*Other upper air cyclonic circulations*					
1.	Lower levels	1 – 2	Gangetic West Bengal and neighbourhood	Southwest	Orissa and neighbourhood	Less marked on 3. A trough from this system extended to : Kerala through Andhra Pradesh and south interior Karnataka on 2; from coastal Andhra Pradesh to Kerala through Rayalaseema and Tamil Nadu on 3 and became less marked on 4
2.	Lower levels	8 – 9	North Madhya Maharashtra and adjoining Marathwada	East	Telangana and neighbourhood	Less marked on 10
3.	Lower tropospheric levels	27 – 28	South Madhya Maharashtra	East	North interior Karnataka and adjoining south Madhya Maharashtra	Less marked on 29
4.	Do	31 Mar	Commorin area and adjoining Kerala			Less marked on 1 April. A trough from this system extended to north Konkan on 31 which became less marked on 2

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**C**)	*Troughs in easterly*					
1.	Trough of low (at sea level)	14 – 16	Southeast and adjoining southwest Bay	West	Commorin and adjoining Sri Lanka	Less marked on 17
(**D**)	*Troughs in westerly*					
1.	Lower levels	3	Arunachal Pradesh to north Bay	Stationary	*In situ*	Less marked on 4
2.	Do	7	Assam & Meghalaya to northeast Bay	Do	Do	Less marked on 8 It was first observed as a cyclonic circulation in lower tropospheric levels over Assam & Meghalaya and neighbourhood on 6
3.	Do	10 – 13	East Rajasthan to coastal Karnataka	East	Haryana to Telangana	Less marked on 14
4.	Mid and upper troposphere	11 – 14	Long. 75°E, to the north of Lat. 20° N	Do	Long. 75° E, to the north of Lat. 20° N	Less marked on 15
5.	Lower levels	22 – 23	Sub-Himalayan West Bengal & Sikkim to Orissa	Do	Sub-Himalayan West Bengal & Sikkim to north Bay	Less merged on 24
(**E**)	*Trough / wind discontinuity*					
(1)	At lower levels	29 Mar – 3 Apr	Orissa to south Maharashtra coast	Oscillatory	Orissa to north Tamil Nadu	Less marked on 18
(**F**)	*Other Troughs*					
1.	Lower levels	22 – 26	East Madhya Pradesh to south interior Karnataka	Quasi-stationary	Rayalaseema to south interior Karnataka	Less marked on 27

Very heavy rain occurred on one day in Jammu & Kashmir. *Heavy rain* occurred on 1 to 3 days in Andaman & Nicobar Islands, Haryana, Punjab, Himachal Pradesh and Jammu & Kashmir.

Rain or snow occurred either *at most places* or *at many places* on: 6 to 8 days in Uttarakhand, Himachal Pradesh and Jammu & Kashmir. It occurred either *at a few places* or *at isolated places* on 8 days in Jammu & Kashmir; on 4 days each in Uttarakhand and Himachal Pradesh, rain or thundershowers occurred either *at most places* or *at many places* on: 4 days in west Uttar Pradesh and on 1 to 3 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Jharkhand, east Uttar Pradesh, Haryana, Punjab and east Madhya Pradesh. It occurred either *at a few places* or *at isolated places* on: 12 to 18 days in West Bengal & Sikkim, Orissa, and Kerala; 9 to 10 days in Arunachal Pradesh, Haryana and Jammu & Kashmir; on 4 to 7 days in Andaman & Nicobar Islands, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Jharkhand, Bihar, Uttar Pradesh, Punjab, Rajasthan, Madhya Pradesh, Vidarbha, Chattisgarh, coastal Andhra Pradesh and Tamil Nadu and on 1 to 3 days in Saurashtra & Kutch, Marathwada, Telangana and coastal & south Interior Karnataka.

Month's rainfall was: *excess* in 11 meteorological sub-divisions *viz.*, Gangetic West Bengal, Bihar, east Uttar Pradesh, west Uttar Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir, west Rajasthan and east Rajasthan; *normal* in 2, *viz.*, Jharkhand and east Madhya Pradesh; *deficient* in 5, *viz.*, Andaman & Nicobar Islands, Sub-Himalayan West Bengal & Sikkim, west Madhya Pradesh, Vidarbha and Chattisgarh and *scanty* in 14, *viz.*, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Orissa, Gujarat region Saurashtra & Kutch, Marathwada, coastal Andhra Pradesh, Telangana, Tamil Nadu, coastal Karnataka, north interior Karnataka, south

TABLE 3

Details of the weather systems during April 2007

S. No.	System	Duration	Place of first location	Direction of movement	Final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Low pressure area*					
1.	Well–marked low pressure area	10 – 15	Gulf of Mannar	Northeast	Southeast and adjoining southwest Bay	It was first observed as a trough of low at sea level over southeast Bay on 6. It lay as low pressure area over Sri Lanka and adjoining Commorin areas and Gulf of Mannar on 10; became well–marked on 14 and became less marked on 16. However, the associated cyclonic circulation became less marked on 17
(**B**)	*Western disturbances /Eastward moving systems*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Mid tropospheric levels	7 – 9	Northwest Rajasthan	East	East Rajasthan and adjoining northwest Madhya Pradesh	Less marked on 10
2.	Do	17 – 20	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and neighbourhood	Moved away northeastwards on 21
3.	Lower levels	17 – 20	Punjab and adjoining Haryana	East	Central parts of Uttar Pradesh	Less marked on 21
4.	Lower tropospheric levels	19 – 20	Northwest Rajasthan	Stationary	*In situ*	Less marked on 21
5.	Mid tropospheric levels	21 Apr – 6 May	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and adjoining Punjab	Moved away northeastwards on 7 May
6.	Do	22	Central Pakistan and adjoining Punjab	–	–	Less marked on 23
(*ii*)	*As an induced cyclonic circulation*					
1.	Mid tropospheric levels	29 – 30	West Rajasthan and neighbourhood	Northeast	East Rajasthan and adjoining west Uttar Pradesh	Less marked on 1 May
(**C**)	*Other upper air cyclonic circulations*					
1.	Lower levels	10 – 11	Assam & Meghalaya and neighbourhood	Oscillatory	Arunachal Pradesh and adjoining Assam & Meghalaya	Less marked on 12
2.	Do	15	Bihar and neighbourhood	Stationary	*In situ*	Less marked on 16
3.	Mid tropospheric levels	18 – 20	West central Bay off south Orissa and north Andhra coasts	Quasi–stationary	Orissa and neighbourhood	Less marked on 21
4.	Lower tropospheric levels	19 – 20	Madhya Maharashtra and neighbourhood	Stationary	*In situ*	Less marked on 21
5.	Do	26 – 29	West Uttar Pradesh and neighbourhood	Do	Do	Less marked on 30

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**D**)	*Easterly troughs*					
1.	As a trough of low at sea level	5 – 8	Southwest Bay off Sri Lanka coast	Northwest	Maldives–Lakshadweep areas	Less marked on 9
2.	Lower levels	5 – 6	South Tamil Nadu to south Madhya Maharashtra	Oscillatory	North Madhya Maharashtra	Less marked on 7
3.	Do	7 – 18	East Uttar Pradesh to Goa–Karnataka coasts	West	West Madhya Pradesh to south Tamil Nadu	Less marked on 19
4.	As a trough of low at sea level	27 – 30	Andaman Sea and neighbourhood	Do	Southwest Bay and adjoining Sri Lanka	Less marked on 1 May
(**E**)	*Westerly troughs*					
1.	Lower levels	2 – 8	Sub-Himalayan West Bengal & Sikkim to north Bay	Oscillatory	Northwest Bay of Bengal	Less marked on 9. It lay as a cyclonic circulation over Gangetic West Bengal and neighbourhood on 8
2.	Do	11	Bihar to north Bay	Do		Less marked on 12
3.	Do	22 – 27	Assam & Meghalaya to north Bay	Do	Sub-Himalayan West Bengal & Sikkim to north Bay	Less marked on 28. It was with an embedded cyclonic circulation over Jharkhand and adjoining Gangetic West Bengal on 24 to 26
(**F**)	*Other troughs*					
1.	Lower levels	4	South Tamil Nadu to Chattisgarh	Stationary	*In situ*	Less marked on 5
2.	Do	12 – 14	East Madhya Pradesh to Assam & Meghalaya	Do	Do	Less marked on 15
3.	Do	17 – 20	East Madhya Pradesh to Bangladesh	Oscillatory	East Uttar Pradesh to Bangladesh	Less marked on 21. It was seen with an embedded cyclonic circulation over Jharkhand on 17 & 18; Gangetic West Bengal and neighbourhood on 19 & 20 and became less marked on 21
4.	Trough / wind discontinuity	20 Apr – 7 May	South Madhya Maharashtra to south Tamil Nadu	Do	Orissa to south Tamil Nadu	Less marked on 8 May

interior Karnataka and Kerala. There was no rain in the remaining 4 meteorological sub-divisions, *viz.*, Konkan & Goa, Madhya Maharashtra Rayalaseema and Lakshadweep.

3.1.2. *Temperature distribution*

The dates of occurrence of cold waves and dates on which the minimum temperature remained appreciably to markedly above/below normal and above/below normal are given in Table 6. The same date appearing in two different columns of a sub-division may be reckoned as occurrence of that category over parts of the sub-divisions. The minimum temperatures were normal for the rest of the days.

Severe cold wave conditions prevailed on 1 to 2 days in parts of Uttarakhand and Jammu & Kashmir. Cold wave conditions also prevailed 4 to 6 days in parts of east Uttar Pradesh, Uttarakhand, Himachal Pradesh and Uttarakhand and on 1 to 2 days in Haryana, Chandigarh & Delhi, Punjab, east Rajasthan and Saurashtra & Kutch.

The month's and the season's lowest minimum temperature over the plains was 5.0° C recorded at Adampur (Punjab) on 7 March 2007.

TABLE 4

Details of the weather systems during May 2007

S. No.	System	Duration	Place of first location	Direction of movement	Final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**)	*Cyclonic storms / Depressions*					
1.	Depression	3 – 5	North Andaman Sea	North	Central Myanmar	It formed under the influence of a cyclonic circulation over south Andaman Sea and neighbourhood on 1. Became low pressure area on 2, well–marked low pressure area on 3 and concentrated into depression in the same evening. Details of the system are given in the text
2.	Cyclonic storm (Akash)	13 – 15	East central Bay and neighbourhood	North to northeast	Mizoram and adjoining Bangladesh	A low pressure area formed over east central Bay and neighbourhood on 11, became more marked on 12, concentrated into depression on 13 morning and cyclonic storm on 14 morning. Details of the system are given in the text
(**B**)	*Western disturbances /Eastward moving cyclonic circulations*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Mid tropospheric levels	5 – 8	East Uttar Pradesh and neighbourhood	East	Jharkhand and adjoining areas	Less marked on 9
2.	Do	6 – 10	North Pakistan and neighbourhood	Northeast	Jammu & Kashmir and neighbourhood	Moved away northeastwards on 11
3.	Do	8 – 9	Haryana and neighbourhood	Quasi–stationary	Haryana and adjoining west Uttar Pradesh	Less marked on 10
4.	Do	8 – 10	East Uttar Pradesh and neighbourhood	Stationary	*In situ*	
5.	Do	16	Haryana and adjoining Uttarakhand	Do	Do	Less marked on 17
6.	Do	16 – 19	North Pakistan and adjoining Jammu & Kashmir	Do	Northeast northern parts of Jammu & Kashmir	Moved away on 20
7.	Mid tropospheric levels	17 – 19	East Uttar Pradesh and neighbourhood	East	Bihar and neighbourhood	Merged with the trough in westerlies from Bihar to Orissa on 20
8.	Lower tropospheric levels	18 – 20	West Uttar Pradesh	Quasi–stationary	West Uttar Pradesh and adjoining east Uttar Pradesh	Less marked on 21
9.	Do	20 – 24	North Pakistan and adjoining Jammu & Kashmir	Northeast	Northern parts of Jammu & Kashmir	Moved away on 25
10.	Do	21 – 22	Punjab and adjoining northwest Rajasthan	Do	Uttaranchal	Less marked on 23
11.	Do	23 – 25	Punjab and neighbourhood	East	Haryana and neighbourhood	Less marked on 25
12.	Do	24 – 28	North Pakistan and adjoining Jammu & Kashmir	North east	Jammu & Kashmir	Moved away on 29
13.	Do	27 – 28	Punjab and neighbourhood	Stationary	*In situ*	Less marked on 29
14.	Do	31 May – 1 June	North Pakistan and adjoining Jammu & Kashmir		Northern parts of Jammu & Kashmir	Moved away on 2 June

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(*ii*)	*As an induced cyclonic circulation*					
1.	Mid tropospheric levels	27 – 28	Punjab and neighbourhood	Stationary	*In situ*	Less marked on 29
(*iii*)	*Easterly moving troughs*					
1.	Mid & upper tropospheric westerlies	24 – 28	Long. 68° E, north of Lat. 30° N	East	Long. 75° E, north of Lat. 20° N	Less marked on 29
2.	Lower level westerlies	24 – 25	Bihar to Orissa	Stationary	*In situ*	Less marked on 26. It was seen with an embedded cyclonic circulation over Orissa and neighbourhood on 24 & 25
3.	Do	29 – 30	Do	Do	Do	Less marked on 31 May. It lay as a cyclonic circulation in lower tropospheric levels over Bihar and neighbourhood on 31 May which became less marked on 1 June
(**C**)	*Other cyclonic circulations*					
1.	Mid tropospheric levels	1 – 4	Bihar and neighbourhood	Quasi–stationary	Jharkhand and adjoining areas on 2	Less marked on 5
2.	Do	9	Orissa and neighbourhood	Stationary	*In situ*	Less marked on 10
3.	Do	11 – 13	Punjab and neighbourhood	Southwest	Haryana and adjoining east Rajasthan	Less marked on 14
4.	Do	11 – 12	East central Arabian Sea off Karnataka coast	Stationary	*In situ*	Less marked on 13
5.	Do	17 – 20	North Bay and adjoining Gangetic West Bengal	Northeast	Bangladesh and adjoining Gangetic West Bengal	Lay as a trough from Sub-Himalayan West Bengal & Sikkim to east central Bay in lower and mid tropospheric westerlies on 21 and from Bihar to north Bay on 22, to Orissa in lower level westerlies on 23
6.	Do	17 – 20	South Konkan & Goa and adjoining south Madhya Maharashtra	Quasi–stationary	North Maharashtra–Gujarat coasts	Less marked on 21
7.	Do	28 – 30	South Gujarat – north Maharashtra coasts	Stationary	*In situ*	Less marked on 31
(**D**)	*Off shore troughs*					
1.	Sea level	28 – 29	South Maharashtra to Kerala coasts	Oscillatory	South Maharashtra to Kerala coasts	Continued to seen in the monsoon season
(**E**)	*Other troughs*					
1.	Lower levels	15 – 17	Northwest Rajasthan to Jharkhand	Oscillatory	Haryana to Gangetic West Bengal	Less marked on 18

TABLE 5

Principal amounts of rainfall (1 cm and above) (March, April and May 2007)

Date	March	April	May
(1)	(2)	(3)	(4)
1.	Chandigarh 9, Ambala 7, Shimla 6, Auraiya, Baghpat & Bhuntar 4 each, Malda 3, Kukernag, Badarwah, Sankalan & Jaipur 2 each, Hardoi, Safipur & Dholpur 1 each	Palayamkottai 3, Tiruchendur & Sattur 2 each, Shivaganga & Srivaikuntam 1 each	Rairangpur 11, Thakurmunda 5, Talcher, Mangalore & Panambur 4 each, Angul, Telkoi & Bhagalpur 3 each, Anandpur, Mahendragarh & Mohana 2 each, Kozhikode, Nedumbassery, Hut Bay, Maya Bandar, Tuni, Waltair, Tantloi & CIAL Kochi 1 each
2.	Bankura & Midnapore 5 each, Mellabazar & Shimla 4 each, Phoolpur & Majbat 3 each, Bhalukpong & Bharali 2 each, Sultanpur, Nakar, Nagina, Mukteswar & Kuzhithurai 1 each	Quilandy, Varkala & Radhapuram 5 each, Punalur 3, Aluva, Perambavour, CIAL Cochi & Kottayam 2 each, Dhollabazar, Banihal, Gulmarg, Chengannur, Paravur, Vadakara, Mylaudi & Thovalai 1 each	Mysore 4, Chitradurga & Coonoor 3 each, Dharamsala, Port Blair & Nancowry 2 each, Medikeri, Bangalore, Hassan, Kozhikode, Karipur, Maya Bandar, Bhagalpur, Tuni, Car Nicobar & Tehri 1 each
3.	Champasari 5, Mathabhanga, Damohani & Jalpaiguri 4 each, Passighat & Chouldhowaghat 3 each, Cuttack, Itanagar & Gulmarg 2 each, Tezu, Miao & Dhollabazar 1 each, Tenkasi 6, Palacode, Kuzhithurai & Thuckalay 1 each	Itanagar 7, North Lakhimpur 6, Tezu & Dibrugarh 5 each, Tadong 4, Passighat & Neora 3 each, Tezpur, Gangtok, Basar, Mazbat, Tangla & Sankalan 2 each, Tawang 1	Quilandy 8, Vadakara 5, Mohana, Chittur, Alapuzha & Ongole 4 each, Cuddalore, Coimbatore, Quazi Gund, Kashinagar, Udhampur, Pandoh, Manjeri & Cherthala 3 each, Bapatla, Nancowry, Hut Bay, Port Blair, Adirampattinam, Kolkata, Shimla, Katra, Kozhikode, Karipur, Long Islands & Pathankot 2 each, Kottayam, Sagar & Maya Bandar 1 each
4.	Gulmarg 2, Kupwara, Changlong & Visakhapatnam 1 each	Gangtok 6, Itanagar 5, Matizuri & Dholai 4 each, Cherrapunji, Dillighat & Tadong 3 each, Tezu, Karimganj & Dibrugarh 2 each, Ziro, Mazbat, North Lakhimpur & Lakhipur 1 each	Murti 10, Kudulu & Nagrakata 8 each, Raichur 7, Kashganj, Thambalapalle, Champasarai & Neora 6 each, Rayagada 5, Kozhikode, Hut Bay & Kuppady 4 each, Kolkata, Tiruchirapalli, Anantpur & Maya Bandar 3 each, Tambaram, Shirali & Nancowry 2 each, Ranchi, Jammu, Pendra, Kurnool, Gadag, Visakhapatnam, Mangalore, Honavar, Mysore, Alapuzha, Kottayam, Nedumbassery & Car Nicobar 1 each
5.	Paravur, CIAL Kochi, Gangtok, Gulmarg, Kupwara & Shalimar 1 each	Dharmanagar & Kailashahar 3 each, Basar & Karimganj 2 each, Sibsagar, Nalbari, Sankalan & Gangtok 1 each	Bahraich 9, Maya Bandar 7, Punalur & Bhavanipatna 5 each, Mavelikara & Haripad 4 each, Nalgonda, Alapuzha, Hut Bay & Kayamkulam 3 each, Long Islands, Port Blair, Jagdalpur, Nancowry & Lucknow 2 each, Guna 1
6.	Tadong & north Lakhimpur 1 each	Cherrapunji 9, Dillighat, Silchar & Dharmanagar 3 each, Jalpaiguri 2, Gharmura, Khonsa, Basar, Changlong, Kanjirapally, Tondi & Guwahati 1 each	Haripad 11, Kochi 7, Kottayam, Quilandy & Belonia 6 each, Munnar & Chittur 4 each, Thiruvananthapuram, Kodaikanal, Sabroom, Tilaiya & Kollengode 3 each, Nedumbassery, Tuni, Allahabad & Nancowry 2 each, Jaipur, Hut Bay & Sorada 1 each
7.	Kollam 7, Sankalan 2	Tuticorin 4, Chepan, Minicoy, Tikrikilla, Kherunighat & Cherrapunji 3 each, Alipurduar & Cooch Behar 2 each, Kuzhithurai, Mylaudi, Ramanathapuram, North Lakhimpur & Joida 1 each	Vadakara 9, Suri 8, Chitradurga & Hassan 6 each, Thalasserry, Bageshwar & Baliguda 5 each, Tangla, Kolhapur, R. Udayagiri & Bankura 4 each, Bangalore & Port Blair 3 each, Kozhikode, Cannur, Visakhapatnam, Daltonganj, Tehri & Maya Bandar 2 each, Belgaum, Kalingapatnam, Anantpur, Vellore, Hut Bay, Car Nicobar, Nancowry, Guwahati, Shillong, Patna, Gaya, Ambikapur, Medikeri, Delhi, Cherrapunji, Dhubri, Kailashahar & Cooch Behar 1 each

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
8.	Itanagar & Kozhikode 1 each	Sankarankoil 7, Goalpara & Mylaudi 6 each, Senkottai, Cherrapunji, Passighat, Gangtok, Kayamkulam, Sukinda & Dillighat 5 each, Kottayam, Khonsa, Sibsagar, Radhapuram, Thiruvananthapuram & Kailashahar 4 each, Narnaul, Nagercoil, Thovalai, Ayikudi, Tenkasi & Varkala 3 each, Imphal, Guwahati, Eraniel & Adirampattinam 2 each, Kuzhithurai, Thuckalay, Kanyakumari, Ambasamudram, Srivaikuntam, Adirampattinam, Vilathikulam, Silchar, Lengpui, Kanyakumari & Minicoy 1 each	Canning Town 9, Malkangiri 6, Alipingal, Port Blair & Hut Bay 5 each, Kohima, Rayagada & Car Nicobar 4 each, Keonjhargarh, Bhubaneshwar, Kottayam, Punalur, Digha, Katra, Malda, Kotra & Gharmura 3 each, Puri, Indore, Jagdalpur, Tuni, Cuttack, Kailashahar & Nancowry 2 each, Pahalgam, Banihal, Quazi Gund, Visakhapatnam, Narsapur, Nagapattinam, Mangalore, Imphal, Gopalpur, Lengpui & Maya Bandar 1 each
9.	Chandrapur, Mahendragarh & Brahmpuri 1 each	Cherrapunji 15, Silchar 10, Karimganj 8, Jaleswar, Rajghat, Dholai, Goalpara & Kanyakumari 7 each, Baripada, Lakhipur, Mylaudi & Guwahati 6 each, Nagercoil & Gangtok 5 each, Balimundali, Tezu, Miao & Khonsa 4 each, Thovalai, Jorhat & Digha 3 each, Imphal, Kuzhithurai, Mudukulathur, Ayikudi, Radhapuram & North Lakimpur 2 each, Eraniel, Tiruchendur, Vilathikulam, Kovilpatti, Kailashshar, Ottapidaram, Thuckalay, Tenkasi, Shillong, Cooch Behar, Lengpui, Balasore & Narnaul 1 each	Car Nicobar 9, Kolkata & Naraj 5 each, CIAL Kochi, Alipingal, Cuttack & Durgapur 4 each, Medikeri, Shantiniketan, Chandbali, Nancowry, Mancompu, Haripad & Chouldhowaghat 3 each, Kochi, Thiruvananthapuram, Bhubaneshwar & Cuttack 2 each, Puri, Anantpur, Maya Bandar & Lengpui 1 each
10.	Midnapore 7, Jaypore & Krishnaprasad 5 each, Jenapur, Baripada, Ghatgaon & Mohanapur 4 each, Amritsar 2, Berthin, Dhundi, Ghamroor & Nadaun 1 each	N. T. Xing 13, Matizuri & Dholai 11 each, Manas & NH Xing 9 each, Thodupuzha 8, Gajoldoba & Mellabazar 7 each, Kumarakom 6, Silchar, Basar, Dharmanagar, Chepan & Kiravati 5 each, Pasighat & Lengpui 4 each, Madurai, Kamudhi, Palayamkottai, Sattankulam, Guwahati, Imphal & Thiruvananthapuram 3 each, Paramakudi, Sankarankoil, Ottapidaram, Tuticorin, Jorhat, North Lakhimpur & Kailashshar 2 each, Tirumangalam, Manamadurai, Tiruvaiyaru, Ambasamudram, Lalgudi, Kovilpatti, Vilathikulam, Virudhunagar, Cherrapunji, Gangtok, Bankura, Kolkata, Hirakund, Ranchi & Alapuzha 1 each	Irrinjalakuda & Nancowry 10 each, Perambavour, Tiruvaiyaru & Kozhikode 7 each, Baghdogra, Simulia & Nedumbassery 5 each, Sevoke, Tarabganj, Rayaghat & Puthimari 4 each, Sultanpur, Canning Town, Agartala, Tezpur, Cherrapunji, Gobindpur & Kashipur 3 each, Bareilly, Mukteswar, Salem, Dibrugarh, Guwahati & Shillong 2 each, Kolkata, Pantnagar, Kanyakumari, Bhubaneshwar, Silchar, Imphal, Kochi, Karipur, Thiruvananthapuram, Port Blair, Long Island & Hut Bay 1 each
11.	Madhabarida, Palampur, Keylong & Tusuma 3 each, Balimundali, Kobra, Kharidwar, Sriniketan & Piravom 2 each, Banihal & Batote 2 each, Bhaderwah, Pahalgam, Kupwara, Agathi, Karnal, Bhuntar & Katra 1 each	Agartala & Agathi 20 each, Nedumbasseri 16, Varkala 14, Arundhutinagar 10, Konni & Thuraiyur 8 each, Eraniel, Kuzhithurai, N. T. Xing & Ottapalam 7 each, Nagercoil & Kollam 6 each, Palayamkottai, Thovalai, Mettupatti, Thodupuzha, A. P. Ghat & Lumding 5 each, Kottayam, Tadong, Kanyakumari & Tirumangalam 4 each, Mylaudi, Thuckalay, Radhapuram, Sattur, Jorhat, Imphal, Lapuzha & Thiruvananthapuram 3 each, Passighat, Silchar, North Lakhimpur, Mudukulathur, Kodavasal & Sivakasi 2 each, Dindigul, Nilakottai, Madurai, Tiruppuvanam, Periyakulam, Mannargudi, Kailashshar, Gangtok & Gopalpur 1 each	Cooch Behar 14, Lakhipur 11, Long Island 8, Jalpaiguri & Silchar 6 each, Maya Bandar, Hut Bay, Sangli & Domohani 5 each, Car Nicobar, Kohima & Kottayam 3 each, Tadong, Gangtok, Lengpui & Cherrapunji 2 each, Delhi, Visakhapatnam, Bapatla, Punalur, Dhubri & Shillong 1 each
12.	Banihal, Batote & Dhundhi 11 each, Katra 10, Jammu 8, Quazigund 7, Bhaderwah & Solangnala 6 each, Kasaganj & Pahalgam 5 each, Madhabarida, Kumarsain, Srinagar & Bhang 4 each, Bhuntar, Kalpa, Sundernagar, Hapur, Baijnath, Palampur & Malkapur 3 each,	Punalur 6, Thuckalay 5, Thiruvananthapuram AP 4, Nagercoil, Ambasamudram, Tripura, Punalur, Palayamkottai & Agartala 3 each, Chitradurga, Jorhat, Eraniel, Mylaudi, Thovalai, Chittampatti, Mettupatti, Tiruppuvanam, Kurnool, Adirampattinam,	Car Nicobar 15, Champasari & Muzaffarpur 7 each, Malda & Purihansa 5 each, Ziro, Nandidah & Panchet 4 each, Patna, Bhagalpur, Purnea, Gorakhpur, Jalpaiguri, Delhi, Imphal, Narsingpur & Nalbari 3 each, Cooch Behar, Bhuntar, Agartala, Ranchi &

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
	Sunnibhajji, Shimla, Kupwara, Berthin, Guler, Batala, Nawanshahar, Karnal, Mukteswar, Tehri & Almora 2 each, Bikaner, Jaisalmer, Jaipur, Amritsar, Nangal, Ambala, Delhi, Chandigarh, Chhachharauli, Gohana, Jagadhari, Nilokheri, Rohtak, Dehra Dun, Hindon, Sarsawa & Kasol 1 each	Vilathikulam, Kukanoor & Kadur 2 each, Shillong, Ayikudi, Lengpui, Watrap, Sira & Kashinagar 1 each	Hut Bay 2 each, Dhubri, Tadong, Sultanpur, Bareilly, Mukteswar, Bankura, Kailashahar & Maya Bandar 1 each
13.	Katra 26, Jammu 15, Pahalgam & Banihal 12 each, Quazigund 11, Batote 10, Srinagar 9, Dadahu & Halwara 8 each, Ghamroor, Jind & Ghurmar 7 each, Bhaderwah, Kupwara, Dharamsala, Ambala & Nawanshahar 6 each, Tehri 5, Berthin, Nadaun, Shimla, Nangal, Hissar, Mukteswar & Bageshwar 4 each, Sunnibhajji, Guler, Nilokheri, Bhuntar, Sundernagar, Amritsar, Adampur, Balachaur, Moga, Delhi, Karnal & Hindon 3 each, Nawanshahar, Pantnagar, Jagadhari, Kalka, Bikaner, Ambala, Chandigarh, Dehra Dun & Sarsawa 2 each, Churu, Jaipur, Ajmer, Pilani, Pachmarhi, Jabalpur, Agra, Sriniketan, Ballia, Bahraich, Gorakhpur, Lucknow, Varanasi, Ludhiana & Patiala 1 each	Pennagaram 6, Lengpui 5, Kailashahar, Haveri & Sidlaghatta 4 each, Bhavani, Paramathy, Uluberia, Savanur, Hanumansagar, Mudigere & Chickmagalur 3 each, Agartala, Karur Paramathy, Hosur, Chickmagalur, Sankarankoil, Horinkhole, Swanpatna, Malkangiri & Subramanya, 2 each, Canning Town, Diamond Harbour, Bhadrachalam, Hyderabad, Raichur, Coimbatore, Kodaikanal, Erode, Chitradurga, Bangalore, Karipur & Sankaridurg 1 each	Kokrajhar 5, Champua & Dhubri 4 each, Phulbani, Panposh, Cherrapunji, Maya Bandar, Long Islands, Nancowry & Kohima 3 each, Car Nicobar, Jharsuguda, Cooch Behar & Port Blair 2 each, Keonjhargarh, Visakhapatnam, Silchar, Kailashahar, Hut Bay & Mani 1 each
14.	Ghumarwin 7, Dhundi, Gohar & Nawanshahar 6 each, Barsar 5, Bhuntar, Ghamroor, Nadaun, Nalagarh, Una, Mukteswar, Baberi & Ranikhet 4 each, Nahan, Pandoh, Ludhiana, Guler, Jubbal, Quazigund, Nangal, Kalka, Patna, Dehra Dun, Ambikapur, Varanasi, Datia, Kalka & Multai 3 each, Berthin, Bhang, Sundernagar, Jabalpur, Satna, Banihal, Batote, Balachaur, Hoshiarpur, Chhachharauli, Narnaul, Pantnagar, Fursatganj, Gorakhpur, Sultanpur & Mandala 2 each, Wardha, Jammu, Katra, Gwalior, Chandigarh, Allahabad, Varanasi, Agra, Forbesganj, Ranchi, Tehri & Srinagar 1 each	Kochi, Pennagaram & Nagercoil 5 each, Bhubaneshwar & Krishnagiri 3 each, Purihansa, Ponampet, Khammam & Alapuzha 2 each, Chennai, Mylaudi, Thuckalay, Hosur, Mettupatti, Namakkal, Coonoor, Kundha Bridge, Cuttack, Keonjhargarh, Nellore, Bhadrachalam, Chennai, Belgaum, Palayamkottai, Radhapuram & Nargund 1 each	Maya Bandar & Imphal 5 each, Long Island, Lengpui & Sabroom 3 each, Chepan, Laxmangarh, Lengpui, Sonamura & Jhansi 2 each, Sonamura, Kailashahar, Matizuri, Sevoke, Imphal & Kohima 1 each
15.	Raigarh & Katra, Patna 2 each, Bhaderwah, Batote, Dhundhi, Passighat, Jamshedpur, Deogarh, Kalpa, Simulia & Asansol 1 each	Maya Bandar, Udumalpet, Nagercoil, Londa & Humchadakatte 5 each, Pollachi, Kochi, Thiruvananthapuram, Nedumbassery, Coonoor, Kundha Bridge, Kiravati & Bhagamandala 4 each, Paud, Siddapura, Soundatti, Karipur, Kottayam & Tiruchengode 3 each, Car Nicobar, Kulithalai, Sendamangalam, Ramanathapuram, Aylikudi & Sankarankoil 2 each, Port Blair, Hut Bay, Hirakud, Mettupalayam, Periyanaikanpalayam, Alapuzha, Sankaridurg, Tenkasi & Virudhunagar 1 each	Cherrapunji & Shillong 5 each, Sabroom & Belonia 4 each, Gorakhpur, Jorhat, Agartala, Tezpur, Gopalpur, Ziro & Arundhutinagar 3 each, Kailashahar, Imphal, Guwahati, Dibrugarh, north Lakhimpur, Madhabarida, Mahendragarh & Tezu 2 each, Dholpur, Waltair, Cuddalore, Kochi, Silchar, Nancowry, Passighat, Diana, Sevoke & Uluberia 1 each
16.	Chandbali 4, Passighat & Akhuapada 2 each, Sankalan, Digha & Punalur 1 each	Eraniel 10, Tiruppuvanam 9, Nilakottai, Madurai, Maya Bandar & Virudhunagar 5 each, Gaya, Nagercoil, Thuckalay, Kundha Bridge, Kamudhi, Yercaud & Srivilliputtur 4 each, Pollachi, Dindigul, Vedasandur, Chittampatti, Tiruvaiyaru & Srivaikuntam 3 each, Mettupatti, Perungalur, Paramakudi, Minicoy, Palayamkottai, Senkottai, Sattur, Kota & Munirabad 2 each, Kulithalai, Namakkal, Mukteswar, Bhira, Mahabaleshwar, Pune, Ramagundam, Rasipuram, Gudalur Bazar, Ketti, Salem, Honavar, Adirampattinam, Palakkad, Radhapuram, Thathiyengarpet, Karipur, Vilathikulam & Cannur 1 each	Miao & Passighat 7 each, Karimganj & Rairangpur 5 each, Khowang & Tezu 4 each, Dibrugarh, Jorhat, Dillighat, Neematighat, Imphal, Chouldhowaghat, Bihubar, Deomali, Gobindpur, Udala & Simulia 3 each, Itanagar, Ranchi, Silchar, north Lakhimpur, Cherrapunji, Amraghat, Dholai, Matizuri, Naharkatia, Bhalukpong, Tawang, Sorada & Purihansa 2 each, Srinagar, Tezpur, Shillong, Barpeta, Lakhipur, Annapurnaghat, Gangtok, Golaghat, Kherunighat, Tangla, Daporijo & Kochi 1 each

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
17.	Cannur & Coonoor 5 each	Murti & Kozhikode 5 each, Gajoldoba 4, Mangalore, Watrap, Chepan, Nagarkata, Neora & Bajpe 3 each, Karjat, Karipur & Jalpaiguri 2 each, Nasik, Maya Bandar, Car Nicobar, Cherrapunji, Gangtok, Mannargudi, Shirahatti & Kothagudam 1 each	Nowgong 9, Bargarh 8, Car Nicobar 7, Rajghat, Chhatarpur & Arundhutinagar 6 each, Tikabali, Sonamura & Bahraich 5 each, Imphal 4, Diamond Harbour, Canning Town, Agartala, Balasore, Nancowry, Barackpur & Ayanagar 3 each, Delhi, Una, Rajgarh, Gopalpur, Varanasi, Digha & Khonsa 2 each, Nalagarh, Dharampur, Arki, Rampur, Kumarsain, Sundernagar, Pandoh, Jogindernagar, Nadaun, Sujanpur Tira, Ghamroor, Guler, Palampur, Kalpa, Bhuntar, Jhansi, Mukteswar, Paradip, Puri & Kailashahar 1 each
18.	Konni 2, Kottayam, Varkala & Thuckalay 1 each	Perambalur 7, Virudhachalam, Chettikulam & Keerapur 6 each, Kumbakonam, Tiruvaiyaru, Chengam, Angul, Basar & Cuttack 5 each, Ariyalur, Thirukattupalli, Valangaiman, Polur & Pullambadi 4 each, Ludhiana, Kattumannarkoil, Srimushnam, Uthangarai, Tirupattur, Gudari & Tavaregere 3 each, Chidambaram, Mayiladuthurai, Vedaranniyam, Perungalur, Tondi, Thanjavur, Papanasam, Mannargudi, Needamangalam, Tiruchirapalli, Dharamsala, Lalgudi, Thuraiyur, Tiruchirapalli & Subramanya 2 each, Mysore, Sundernagar, Akola, Satara, Bhadrachalam, Cuddalore, Port Blair, Gorakhpur, Bahraich, Ambala, Shimla, Sendamangalam, Ketti, Jayamkondam, Thirumayam, Sankaridurg, Yercaud, Vallam, Tiruvannamalai, Sholingir, Tirukoilur, Dehra Dun, Tehri & Kankavali 1 each	Diamond Harbour & Matizuri 6 each, Pattamundai & Kailashahar 5 each, Nilgiri, Kendrapada, Bankura, Barackpur, Gharmura & Aizwal 4 each, Agartala 3, Keonjhargarh, Mukteswar, Balasore, Chandbali, Long Islands, Silchar, Port Blair & Hut Bay 2 each, Narnaul, Pilani, Cuttack, Jharsuguda, Car Nicobar, Nancowry, Guwahati & Patna 1 each
19.	Thodupuzha 2, Piravom & Kanjirapally 1 each	Kangeyam & Kuppam 7 each, Anekal, Bandipura & Mahendragarh 4 each, Kanakapura & Bissam 3 each, Ganganagar, Mukteswar & Maya Bandar 2 each, Ambikapur, Tirupathi, Tehri, Narnaul, Nancowry & Pantnagar 1 each	Bagati, Dharamsala & Lengpui 5 each, Sabroom & Katra 4 each, Palampur, Bhuntar, Jogindernagar, Maya Bandar & Banpur 3 each, Banihal, Srinagar, Quazigund, Bhaderwah, Sundernagar, Rohru, Patna, Talcher, Baliguda, Khonsa, Panchanabali, Quazi Gund & Srinagar 2 each, Jammu, Pahalgam, Sagar, Pendra, Jalgaon, Nagpur, Sultanpur, Tehri, Bareilly, Pantnagar, Ghamroor, Agartala, Port Blair & Hut Bay 1 each
20.	Quazi Gund 6, Banihal 5, Roharu, Katra & Jammu 3 each, Srinagar 2, Bapatla, Bhuntar, Keylong, Jogindernagar, Malerkotla & Kasol 1 each	Yercaud, Thanjavur, Sholingir & Basaralu 7 each, Raichur, Yelhanka, Aryankavu & Navrangpur 6 each, Passighat & Sibsagar 5 each, Soundatti, Malur & Kashinagar 4 each, Bangalore 3, Jalpaiguri, Gadag & Dibrugarh 2 each, Indore, Mahabaleshwar, Aurangabad, Adirampattinam, Belgaum, Chitradurga, Karaikal, Sawai Madhopur, Guwahati & Cherrapunji 1 each	Jiebharail & NT Xing 9 each, Sevoke 7, Tezpur, Amraghat & Kherunighat 6 each, Balasore, Chouldhowaghat, Silchar, Amraghat & Tezpur 5 each, Keonjhargarh, Hissar, Chandbali, Anandpur & Bankura 4 each, Dholai, Lakhipur, Karimganj, Dhollabazar, Annapurnaghat, Kolkata, Bhalukpong & Rampurhat 3 each, Paradip, Gaya, Dibrugarh, Matizuri, Naharkatia, Golaghat, Kamrup & Bihubar 2 each, Khowang, Mazbat, Itanagar, Bikaner, Churu, Hoshangabad, Minicoy, Ranchi, Gorakhpur, Dharamtul & Port Blair 1 each
21.	Ghumarwin, Palampur, Banihal & Batote 6 each, Baijnath, Dharamsala, Bhaderwah & Quazigund 5 each, Sujanpur Tira, Katra & Pahalgam 4 each, Srinagar & Jogindernagar 3 each, Kasol & Batala 2 each, Jammu, Bhuntar, Shimla & Sundernagar 1 each	Cherrapunji 15, Tangla 10, Itanagar 8, Karimganj 7, Kuppady & Tadong 6 each, Deogarh & Passighat 5 each, Kottayam, Kunigal, Gangtok, Neora & Daporijo 4 each, Punalur, Cooch Behar, Nasik, Dibrugarh & Somwarpet 3 each, Jalpaiguri, Jamshedpur,	Alipurduar 8, Naharkatia 7, Chepan 6, Hasimara, Contai & Shajapur 5 each, Diamond Harbour, Cherrapunji, Agartala & Kunigal 4 each, Puri, Paradip, Alipingal, Pattamundai, Sirsa & Tendukheda 3 each, Machilipatnam, Cuttack, Haldia, Cooch

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
		Medikeri & north Lakhimpur 2 each, Ujjain, Shajapur, Mahabaleshwar, Arogyavaram, Kodaikanal, Mysore, Keonjhargarh, Dhubri & Kailashahar 1 each	Behar & Malda 2 each, Bhagalpur, Rajgarh, Kalimpong, Jalpaiguri, Gangtok & Agartala 1 each
22.	Bhalukpong, Darjeeling & Gohar 5 each, Dharmanagar & Pandoh 4 each, Lakhipur, Gharmura, Perinthalmanna, Banihal, Bhaderwah, Kasol, Sundernagar, Bhuntar, Nangal & Kailashahar 3 each, Quazigund, Berthin, Kahu, Rampur Bushar, Amritsar, Kalka, Dharamtul & Singlabazar 2 each, Jammu, Dehra Dun, Guler, Nadaun, Shimla, Balachaur, Ludhiana, Ambala, Gangtok, Tadong, North Lakhimpur, Tezpur, Jorhat, Silchar & Sunnibhajji 1 each	Passighat 15, Matizuri 11, Karimganj 9, Bangalore 8, Pappireddipatti, Haveri, Goalpara, Bangalore & Agartala 7 each, Tezu, Lakhipur, Silchar & Agartala 6 each, Kailashahar, Jalpaiguri, Cherrapunji, Lengpui, Sakaleshpura & Itanagar 5 each, Kochi & Dibrugarh 4 each, Tuni, Thiruvananthapuram, north Lakhimpur & Tirupattur 2 each, Coimbatore, Cannur, Dharmapuri, Honavar, Panambur, Chitradurga, Medikeri & Ranchi 1 each	Diana, Hasimara, Neora & Champasari 11 each, Murti, Nagrakata & Chouldhowaghat 10 each, Gajoldoba 9, Sevoke & Cherrapunji 7 each, Gangtok 6, Tadong, Kalimpong, Khanitar & Bhograi 5 each, Barrackpore & Baghdogra 4 each, NH 31, Alipurduar, Shillong, Diamond Harbour, Uluberia, Kailashahar, Passighat & Jaleswar 3 each, Amrawara, Durgachak, Kolkata, Krishnanagar, Singlabazar, Haldia, Cooch Behar, Mathabhanga & Sankalan 2 each, Contai, Midnapore, Digha, Kalaikunda, Mohanpur, Bhagalpur, Sabour, Jhansi, Damoh, Garhakota, Rehli, Jalpaiguri, Domohani, Darjeeling, Nancowry & Port Blair 1 each
23.	Cherrapunji & Car Nicobar 5 each, Kailashahar & Lengpui 4 each, Sonamura 3, Silchar, Guwahati, Dhubri, Konni, Sankalan, Hut Bay, Jamshedpur, Madhabarida, Aizwal, Sabroom & Hasimara 2 each, Jamshedpur 1	Tezu & Dharmanagar 9 each, Dharamasthala & Sonamura 8 each, Kukanoor, Passighat & Sabroom 7 each, Konni 6, Hassan, Silchar, Agartala, Kailashahar, Guwahati & Kolkata 5 each, Damohani, Dibrugarh, Nagrakata & Tangi 4 each, north Lakhimpur, Nancowry, Chitradurga, Kailashahar & Panambur 3 each, Silchar, Haldia, Champasari, Bashirhat, Nedumangad & Jalpaiguri 2 each, Mangalore, Cannur, Jorhat & Seppa 1 each	Itanagar 18, Naharlagan 17, Gangtok 16, AIE NH Xing 13, Dharmanagar 11, Kailashahar 10, Manas & NH Xing 9 each, Beki Road Bridge & Motunga 8 each, Diana 7, Nagarkata, Tezpur, Barpeta, Gharmura, Bhalukpong & Bhandardeva 6 each, Tadong, Shajanpur, Dillighat, Kokrajhar & Passighat 5 each, Neematighat, Chouldhowaghat, Khanapara & Deomali 4 each, Guwahati, Ongole, Matizuri, Jia Bharali NT Xing, Tezu & Matizuri 3 each, Bhubaneshwar, Silchar, Jorhat, Lakhipur, Karimganj, Puthimari, Majbat, Badarpurghat, Khonsa, Lengpui, Long Islands & Kalingapatnam 2 each, Dibrugarh, Bahalpur, Amraghat, Dholai, Naharkatia, Port Blair, Badatighat, Margherita, Imphal, Trikrikilla, Goalpara, Quazigund, Ranchi, Ratnagiri & Pendra 1 each
24.	Gangtok 2	Arundhutinagar 9, Tirupattur 8, Watrap 7, Kunnamkulam & Passighat 6 each, Goalpara, Vellore, Kodaikanal & Cooch Behar 5 each, Dholai & Tadong 4 each, Agartala, Dibrugarh, Tezu, Mazbat & Lengpui 3 each, Guwahati, Tiruchirapalli, Karipur, Shillong, north Lakhimpur, Khonsa & Daporijo 2 each, Uthagamandalam, Kozhikode, Imphal, Jodhpur, Silchar & Miao 1 each	Cherrapunji 53, Sirugppa 13, Avinashi 11, north Lakhimpur 10, Passighat 9, Hoskote & Karimganj 8 each, Thirukattupalli 7, Itanagar 6, Silchar, Perambalur, Arani, Pullambadi, Srivilliputtur & Munnar 5 each, Dibrugarh, Anuur, Aravakurichi, Sanalan & Kaveli 4 each, Visakhapatnam, Kurnool, Bangalore, Mettupalayam, Srimushnam, Denkanikottai, Pochampalli, Sankarankoil & Tirupattur 3 each, Mehbubnagar, Nalgonda, Tiruppur, Dharapuram, Karur Paramathy, Kulithalai, Paramakudi, Watrap & Maparai 2 each, Hyderabad, Mysore, Hassan, Mandya, Kattumannarkoil, Toludur, Gobichettipalayam, Mayanur, Hosur, Krishnagiri, Madurai, Coonoor, Vellore, Ketti, Gangtok, Imphal & Jagdalpur 1 each
25.	Nancowry 9, Silchar, Passighat, Basar & Dharmanagar 2 each, Chandbali, Keonjhargarh, Mohana & Daporijo 1 each	Lengpui 6, Agartala 5, Kailashahar & Nalbari 4 each, Cooch Behar, Mellabazar, Goalpara, Dibrugarh & Dharmanagar 3 each, Guwahati, Dhubri, Silchar & Belonia 2 each, Sabroom, Imphal, Madanpur, Jalpaiguri & Shillong 1 each	Tiruppuvanam 12, Kokrajhar 11, Itanagar & Cherrapunji 10 each, Neora & Alangudi 9 each, Passighat 8, Chouldhowaghat 7, north Lakhimpur, Madurai, Tirumangalam, Virudhunagar & Angudipuram 6 each, Krishnagiri, Sendamangalam,

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
			Tiruchengode, Munnar & Perinthalmanna 5 each, Silchar 4, Sriniketan, Illupur, Sankaridurg & Kodavasal 3 each, Agartala, Dhubri, Raichur, Bhavani, Pudukottai, Attur, Omalur, Shivaganga, Musiri & Srivaikuntam 2 each, Kailashahar, Cooch Behar, Coimbatore, Coimbatore, Sulur, Harur, Erode, Melur, Namakkal, Kothagiri, Naduvattam, Uthagamandalam, Jayamkonkam, Manamadurai, Muthupet, Maya Bandar, Panjim & Kurnool 1 each
26.	Hassan 3, Passighat 2, Chitradurga, Basar & Sonamura 1 each	Cherrapunji 8, Agartala 7, Karimganj 5, Tadong 3, Dholai, Silchar, Shillong, Imphal, Ghatgaon & Sankalan 2 each, Punalur, Guwahati, Daporijo, Khonsa, Gharmura & Khanpara 1 each	Gangtok 11, Belgaum & Kozha 6 each, Kailashahar, Pochampalli, Tirukoilur & Anandpur 5 each, Kodaikanal, Bangalore, Agartala & Cherrapunji 4 each, Tirupathi, Passighat, north Lakhimpur, Silchar & Chengannur 3 each, Banihal, Lengpui, Avinashi, Dindigul, Kodaikanal, Uthangarai, Ketti, Musiri, Uthagamandalam, Arakonam & Tanana 2 each, Mukteswar, Periyanaikanpalyam, Tiruppur, Harur, Aravakurichi, Ariyalur, Vaniyambadi, Vellore & Tindivanam 1 each
27.	Nil	Cherrapunji 7, Jorhat 4, Agartala, Baripada, Car Nicobar, Bagati & Kalikunda 3 each, Passighat & Hut Bay 2 each, Guwahati, Shillong, Dhubri, north Lakhimpur, Bankura, Kozhikode, Karipur, Port Blair, Nancowry, Khonsa, Tawang, Itanagar, Ziro, Sonmura & Aizwal 1 each	Jorhat, Kayakulam, Cherrapunji & Anantapur 5 each, Palacode, Ketti, Palayamkottai, Lalgudi, Dibrugarh, Gadag, Thiruvananthapuram, Bhalukpong & Konni 3 each, Annur, Periyanaikanpalyam, Kodaikanal, Uthagamandalam, Thuraiyur, Tezpur & Mukteswar 2 each, Dindigul, Nagercoil, Melur, Nagapattinam, Naduvattam, Tiruchirapalli, Long Islands, Bareilly, Naduan, Jagdalpur, Nedumbassery & Minicoy 1 each
28.	Car Nicobar 2	T.P Barrage 5, Suri 4, Thiruvananthapuram 3, Kalikunda, D.P. Ghat & Kharagpur 2 each, Imphal, Jamshedpur & Bharakpur 1 each	Konni 17, Kuzhithurai & Irijalakuda 15 each, Quilandy 13, Thrissur 12, Alapuzha, Thuckalay & Ketti 11 each, Kozhikode, Guledgudd & Mavdikara 10 each, Thiruvanthapuram & Thiruvananthapuram 9 each, Kottayam & Eraniel 8 each, Dhubri, Karipur, Nedumbassery, Mylaudi & Thovalai 6 each, Nagercoil & Krishnagiri 5 each, Dharmapuri, Ariyalur, Tezpur, Agartala, Chandbali, Gohar, Kannur & Agathi 4 each, Kattumannarkoil, Kodaikanal, Nilakottai, Uthangarai, Rasipuram, Kothagiri, Panjim, Uthagamandalam & Chettikulam 3 each, Pennagaram, Coonoor, Perambalur, Tirupattur, Tindivanam, Long Islands, Cherrapunji, Nadaun, Chitradurga & Kochi 2 each, Kanyakumari, Paramakudi, Kumbakonam, Vallam, Vaniyambadi, Lengpui, Kailashahar, Cooch Behar, Gangtok, Jalpaiguri, Cannur, Bhagalpur, Sujanpur Tira, Ghamroor, Palampur, Banjar, Sundernagar, Barsar, Bharwain, Mehre, Kupwara, Jagdalpur, Kanyakumari, Bangalore & Amini Divi 1 each

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
29.	Daporijo 1	Sangli 3, Kolkata & Canning Town 2 each, Hut Bay & Dum Dum 1 each	Karwar 9, Honavar 8, Saidepur 7, Dholai, Kollam, Silchar, Lakhimpur & Kasargode 6 each, Krishnagiri, Cherrapunji, Arogyavaram, Karipur, Kalaikunda, Karipur, Valpoi & Dabholim 5 each, Annapurnaghat, Agathi & Panjim 4 each, Daporijo, Matijuri, Karimganj, Chouldhawaghat, Kochi, Alapuzha, Jalpaiguri, Ramagundam, Cannur, Kumarakam, Varkala & Cuttack 3 each, Uthagamandalam, Hut Bay, Dholai, Kurnool, Guna, Jorhat, Manjeri, Kozhikode, Thrithala & Kozha 2 each, Pennagaram, Mylaudi, Nagercoil, Thuckalay, Ketti, Itanagar, Bhalukpong, Seppa, Beki Road Bridge, Barpeta, Kalpa, Shimla, Barmer, Udaipur, Indore, Raisen, Gwalior, Chandrapur, Agumbe, Thodupuzha, Kottayam, Punalur & Amini Divi 1 each
30.	Nil	Akhauapada & Karanjia 2 each, Jajpur, Jenapur, Anandpur, Ranchi, Panambur, Belgaum & Kochi 1 each	Carwar 9, Honavar 8, Sevoke & Thalassaery 7 each, Silchar, Lakhimpur, Amini Divi & Kasargod 6 each, Cherrapunji, Kasargod, Kochi, Panjim, Arogyavaram & Karipur 5 each, Annapurnaghat & Agathi 4 each, Bhalukporg, Daporijo, Matijuri, Karimganj, Choldhowaghat, Jalpaiguri, Cuttak, Ramagundam, Kochi, Alapuzha, Cannur, Kumarakam & Varkala 3 each, Hut Bay, Dholai, Jorhat, Sangli, Kurnool, Manjeri, Kozhikode, Thirthala & Koze 2 each, Mahabaleshwar, Valpoi, Bhubaneshwar, Thuckalay, Coonoor, Itanagar, Bhalukpong, Sepa, Beki Road Bridge, Barpeta, Neematighat, Trikikila, Shillong, Imphal, Bhubaneswar, Mehbubnagar, Kalpa, Shimla, Barmer, Udaipur, Guna, Indore, Raisen, Gwalior, Chandrapur, Agumbe, Thodupuzha, Kottayam, Punalur & Amini Divi 1 each
31.	Sankalan 2	–	Kannur 19, Vadakara 11, Agathi 9, Passighat 8, Thalassery & Quilandy 7 each, Kavaratti, North Lakhimpur, Coonoor, Cannur & Amini 6 each, Itanagar & Karipur 5 each, Kozhikode, Amini Divi, Kochi & Khanitar 4 each, Panjim, Karwar, Thiruvananthapuram, Alapuzha, Long Island, Kozhikode, Jajpur & Sibsagar 3 each, Honavar & Karipur 2 each, Thiruvananthapuram, Tezpur, Dibrugarh, Gangtok, Kailashahar, Bangalore, Kochi, Dhubri, Tezpur, Mukteswar, Mahabaleswar, Chitradurga & Minicoy 1 each

The dates of occurrence of heat waves and dates on which the maximum temperature remained appreciably to markedly above/below normal and above/below normal are given in Table 7. The same date appearing in two different columns of a sub-division may be reckoned as occurrence of that category over parts of the sub-divisions. Maximum temperatures were normal for the rest of the days.

Severe heat wave conditions prevailed on 1 day in parts of Saurashtra & Kutch. Heat wave conditions prevailed on 1 to 2 days in parts of west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Gujarat Region, Saurashtra & Kutch, Madhya Maharashtra and Vidarbha. Hot day conditions prevailed on 3 to 5 days in parts of Saurashtra & Kutch and Konkan & Goa and on 1 to 2 days in Vidarbha, coastal Andhra

TABLE 6

Dates of occurrence of heat wave/severe heat wave and various categories of maximum temperatures - March 2007

Sub-division No.	Name	Dates (Number of days)						
		Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
2.	Arunachal Pradesh				14, 21 (2)		3, 8 (2)	12 (1)
3.	Assam & Meghalaya				2, 6, 11, 13, 14, 16, 20-22, 25, 29-31 (12)	10, 12, 17, 24, 26-28 (7)	3, 4, 7, 9, 23, 24 (6)	5, 8, 17, 26 (4)
4.	Naga., Mani., Mizo. and Tri.				6, 13-15, 19, 21, 22, 29-31 (10)	1, 10, 11, 16, 26-28 (7)	3, 4, 8, 23, 24 (5)	2, 9 (2)
5.	S. H. W. B. & Sikkim				30, 31(2)	14, 21, 22, 29 (4)	2-4, 6-9, 15-17, 23, 24 (12)	8, 10, 18, 23, 28 (5)
6.	Gangetic West Bengal					28, 29 (2)	3, 4, 6, 15-17, 19 (7)	10, 11, 14, 18 (4)
7.	Orissa				6, 24, 25 (3)	12, 20, 22, 27, 29-31 (7)	3, 4, 14, 17 (4)	5, 6, 8-11, 13, 15, 17 (9)
8.	Jharkhand				1 (1)	7, 12, 22-24, 31 (6)	2-4, 8, 13-15, 17, 19, 20 (10)	5-8, 16, 18 (6)
9.	Bihar					19, 31 (2)	2-4, 5, 8, 13-15, 17, 18, 20 (11)	6, 7, 9, 16 (4)
10.	East Uttar Pradesh					1, 29-31 (4)	2-4, 5, 8, 9, 13-20 (9)	6-8, 10, 11, 25 (6)
11.	West Uttar Pradesh					21, 29, 30 (3)	2-4, 8, 13-16 (8)	7-9, 17, 25, 26 (6)
12.	Uttarakhand				6, 8, 9, 24-31 (11)	7, 22-24 (4)	1-3, 11, 13-15 (7)	17 (1)
13.	Haryana, Chandigarh & Delhi				20, 30, 31 (3)	29 (1)	1-4, 8, 12-18, 23, 24 (14)	6-8, 11, 19, 25, 26 (7)
14.	Punjab				30, 31 (2)	22, 29 (2)	1-3, 11-17, 23, 24 (12)	4, 7, 8, 18, 19, 26 (6)
15.	Himachal Pradesh				8, 9, 18, 19, 21, 23, 24, 26, 28-31 (12)	25 (1)	1-3, 13 (4)	
16.	Jammu & Kashmir				2, 6, 8-11, 26-31 (12)	3, 25 (2)	1, 7, 11, 13-15, 20, 21 (8)	4, 12, 23, 24 (4)
17.	West Rajasthan		30, 31 (2)		19, 20, 27-29 (5)	9, 10, 18, 27, 28 (5)	1-4, 12-16, 22-24 (12)	1, 7, 11, 18, 24, 25 (6)
18.	East Rajasthan		31 (1)		19, 20, 27-30 (6)	9, 10, 18, 21, 22, 27, 28 (7)	1-4, 13-16, 23, 24 (10)	1, 7, 18, 24, 25 (5)
19.	West Madhya Pradesh		30, 31 (2)		19-22, 29, 30 (6)	1, 12, 18, 22 (4)	2-6, 8, 13, 15, 16 (10)	6, 7, 15 (3)
20.	East Madhya Pradesh		31 (1)		1, 10, 21, 22, 31 (5)	12, 20, 22, 24, 28, 29 (6)	2-5, 8, 9, 13, 15-17 (10)	6, 7, 15, 18 (4)
21.	Gujarat Region		29, 31 (2)		28-30 (3)	17, 18, 20, 26-28 (6)	2, 3, 13, 14, 22-24 (7)	1, 10, 14, 15, 24 (5)
22.	Saurashtra & Kutch	30 (1)	30, 31 (2)	5-7, 17, 26 (5)	6, 8, 15, 16, 18, 25, 28, 29 (8)	3-5, 8, 9, 12, 17, 24, 26, 27 (10)	3, 13, 14, 22-24 (6)	1, 10, 14 (3)
23.	Konkan & Goa			5, 6, 17 (3)	6, 16, 18, 19, 21 (5)	4, 5, 7, 8, 11, 13, 15, 20, 26, 28-31 (13)		23, 24 (2)
24.	Madhya Maharashtra		31 (1)		6, 19, 20, 27-31 (8)	1, 4, 7, 9, 11, 12, 18, 22, 24-26, 28, 30 (13)	2-4, 14 (4)	2, 3, 14, 16, 23, 24 (6)

TABLE 6 (*Contd.*)

Sub-division No.	Name	Dates (Number of days)						
		Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
25.	Marathawada					1, 9, 20, 27, 29-31 (7)		4, 15-17 (4)
26.	Vidarbha		21 (1)	24 (1)	6, 19-22, 30 (6)	5, 24, 25, 27-31 (8)	3, 13, 16 (3)	4, 15, 17 (3)
27.	Chattisgarh				1, 19, 20-24, 30, 31 (8)	2, 12, 29 (3)	5, 6, 13, 14, 16, 17 (6)	3, 4, 15 (3)
28.	Coastal Andhra Pradesh			21 (1)	2-4, 6, 15, 17, 21, 26, 31 (9)	1, 2, 4, 13, 16, 20, 24, 27-29 (10)		5 (1)
29.	Telangana				6, 23-25, 27, 31 (6)	2, 4, 9, 10, 20, 21, 24-26, 28, 29, 31 (12)	14 (1)	
30.	Rayalaseema			25, 26 (2)	2, 3, 6, 10, 11, 21, 23, 27, 28, 30 (10)	2, 8, 9, 20, 24, 29 (6)		
31.	Tamil Nadu				2, 4, 14, 17, 19, 21-29 (14)	1-5, 7-13, 15, 16, 18, 20, 22-26, 29-31 (24)		13 (1)
32.	Coastal Karnataka			5 (1)	6, 17, 18, 20, 23, 25 (6)	2, 4, 10, 15, 24, 28-30 (8)		
33.	North Interior Karnataka			26 (1)	19, 22, 24 (3)	22, 24, 27-29 (5)		3 (1)
34.	South Interior Karnataka				19, 22-24, 26 (5)	1, 7, 8, 16, 20, 22, 24, 25, 27-30 (12)	6 (1)	3, 9 (2)
35.	Kerala				23 (1)	2-4, 8, 15, 16, 21, 24, 25, 29 (10)		

Pradesh Telangana, coastal Andhra Pradesh, Rayalaseema, coastal and north interior Karnataka.

The month's highest maximum temperature over the plains was 44.0° C recorded at Bhira (Konkan & Goa) on 29 March 2007.

3.1.3. *Disastrous weather events and damage*

According to media and other disaster weather reports, heavy rain, snowfall and hailstorm created havoc in northwest India in the first fortnight of the month. Heavy rains, strong winds, lightning, hailstorm, thunderstorm took a toll of 68 people [Uttar Pradesh (28), Jammu & Kashmir (19), Vidarbha (15), Karnataka (3), West Bengal (2) and Rajasthan (1)]. Crops were damaged. Electric/telephone poles and trees were uprooted due to thunder squall in Assam. Sea erosion and high tides damaged many huts and fishing boats in Kerala. Water logging disrupted normal life and traffic in Karnataka.

3.2. *April*

3.2.1. *Weather and associated synoptic features*

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

Very heavy rain occurred on : 4 days in Assam & Meghalaya, and on 1 day each in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura and Kerala. *Heavy rain* occurred on 9 days in Tamil Nadu and on 1 to 3 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, coastal Andhra Pradesh, Karnataka and Kerala.

Rain/thundershowers occurred either *at most places* or *at many places* on: 11 to 14 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura and Sub-Himalayan West Bengal & Sikkim and on 1 to 4 days in Andaman & Nicobar Islands, Gangetic West Bengal, Punjab, Himachal Pradesh, Telangana and

TABLE 7

Dates of occurrence of cold wave/severe cold wave and various categories of minimum temperatures - March 2007

Sub-division		Dates (Number of days)						
No.	Name	Severe cold wave	Cold wave	Cold Day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
2.	Arunachal Pradesh							12, 14 (2)
3.	Assam & Meghalaya				8, 9, 17, 18 (4)	4, 9, 17, 19, 20, 27 (6)	2, 6, 14, 24-26 (6)	5, 13, 22-24, 30, 31 (7)
4.	Naga., Mani., Mizo. and Tri.				8-10, 17-19 (6)	4, 7, 10, 19, 20, 27 (6)	2, 14, 15, 22, 24-26 (7)	
5.	S. H. W. B. & Sikkim				7, 17, 18 (3)	4, 8, 16 (3)	1, 11, 22-26, 29-31 (10)	1, 2, 5, 6, 13, 14, 20, 28 (8)
6.	Gangetic West Bengal				4, 7, 17-19, 28 (6)	4, 5, 8, 16 (4)	1, 11, 21, 22, 24-26, 29-31 (10)	1, 12, 14, 20 (4)
7.	Orissa				8, 16-18, 28, 29 (6)	4, 6, 16, 18, 25, 31 (6)	1, 2, 9, 10, 22-24, 26 (8)	1, 5, 11, 12, 20-23, 26, 27 (10)
8.	Jharkhand		8 (1)		4, 6-8, 16-18, 27-29 (11)	3, 5, 6, 19, 25, 26 (6)	1, 23, 24 (3)	12, 13 (2)
9.	Bihar		8 (1)		4, 6-10, 16-18, 28, 29 (12)	3, 5, 25, 27 (4)	1, 24 (2)	
10.	East Uttar Pradesh		7-9, 15, 16 (5)		4, 7-11, 17, 18, 25, 29 (10)	3, 6, 10, 14, 16, 17, 19, 24, 26-28 (11)	1, 20, 30, 31 (4)	1, 12, 14, 22, 23, 28 (6)
11.	West Uttar Pradesh				8, 15 (2)	3, 8, 15 (3)	1, 30, 31 (3)	1, 22 (2)
12.	Uttarakhand	14, 15 (2)	1, 2, 15, 16 (4)		2, 3, 13, 14, 17, 25 (6)	4, 7 (2)	20, 30, 31 (3)	1, 10, 19, 28 (4)
13.	Haryana, Chandigarh & Delhi		7, 15 (2)		4, 7, 15-17 (5)	2, 3, 8, 9, 14, 18 (6)	1, 10, 19-21, 30, 31 (7)	1, 28 (2)
14.	Punjab		14 (1)		6, 16, 17 (3)	2, 4, 8, 9, 24, 26 (6)	10, 30, 31 (3)	12, 19 (2)
15.	Himachal Pradesh		1, 2, 14, 15 (4)		23, 24 (2)	3, 10, 12, 25, 27 (5)	18, 19, 29-31 (5)	21, 28 (5)
16.	Jammu & Kashmir	14 (1)	5, 6, 12, 14-16 (6)		1, 8, 13, 23, 24 (5)	7 (1)	11, 29-31 (4)	24, 28 (2)
17.	West Rajasthan				3, 14 (2)	2, 14, 15, 23-25 (6)	1, 5, 9, 10, 11, 17-20, 28-31 (13)	1, 6-8, 13, 19, 21, 26, 27, 30 (10)
18.	East Rajasthan		15 (1)		3, 8, 24 (3)	23-26 (4)	1, 9-11, 18-21, 28, 30, 31 (11)	1, 6, 7, 13, 19, 22, 27, 30 (8)
19.	West Madhya Pradesh				3, 15-17 (4)	4, 6, 26 (3)	1, 11, 13, 19-22, 24, 30, 31(10)	1, 2, 7, 11, 12, 14, 18, 22, 28 (9)
20.	East Madhya Pradesh					4, 26 (2)	1, 11, 13, 19-24, 30, 31 (11)	1, 2, 7, 11, 12, 14, 18, 22, 28, 29 (10)
21.	Gujarat Region				22 (1)	2, 3, 8, 15 (4)	1, 5, 9-13, 18-20, 26, 29-31 (14)	1, 6, 16, 21, 24, 26, 27, 29 (8)
22.	Saurashtra & Kutch		5 (1)		14, 22 (2)	2, 3, 15 (3)	1, 5, 8-10, 12, 13, 17, 18, 20, 26, 29, 31 (13)	1, 4, 16, 19, 21, 23, 24, 26 (8)
23.	Konkan & Goa					8 (1)	5, 8, 19, 21 (4)	4, 6, 13, 16-20, 22, 23, 26, 30, 31 (13)
24.	Madhya Maharashtra				2-4, 8, 9, 13 (6)	9, 10 (2)	20-22, 30, 31 (5)	2, 12, 13, 16, 17, 19, 20, 24, 28 (9)

TABLE 7 (*Contd.*)

Sub-division No.	Name	Dates (Number of days)						
		Severe cold wave	Cold wave	Cold Day	Appreciably to markedly below normal	Below normal	Appreciably to markedly above normal	Above normal
25.	Marathawada				3 (1)	4, 16, 25 (3)	1, 6, 8, 20-24 (8)	11, 13, 14, 31 (4)
26.	Vidarbha					16, 25 (2)	1, 13, 21-24 (6)	11, 12, 30, 31 (4)
27.	Chattisgarh				8, 17, 18 (3)	5-7, 16, 18, 19, 25 (7)	1, 8-11, 21-24 (9)	12, 21 (2)
28.	Coastal Andhra Pradesh					14, 25 (2)	4-6, 9, 10, 22, 24 (7)	2, 3, 7, 8, 11, 16, 19, 20, 22, 23, 26-28 (13)
29.	Telangana				2, 17 (2)	19, 25, 27 (3)	6-10, 13, 21-24 (10)	1, 5, 11, 22, 30 (5)
30.	Rayalaseema				31 (1)	25 (1)	7-10, 22, 26 (6)	5, 11, 16, 21-23, 28 (7)
31.	Tamil Nadu				8, 12, 24, 29-31 (6)	5, 18-21, 23, 24, 28 (8)	3, 4 (2)	2, 4, 10, 13, 17, 24, 27 (7)
32.	Coastal Karnataka				9 (1)	2, 3 (2)	5, 6, 22 (3)	2, 7, 16-18, 20, 21, 24, 26, 28-31 (13)
33.	North Interior Karnataka				2 (1)	19 (1)		1, 14, 15, 22, 23, 24, 26, 28, 31 (9)
34.	South Interior Karnataka				2, 6, 9-11, 22, 31 (7)	3, 12, 19, 23-25 (6)		14, 15, 20, 22, 24, 26, 28 (7)
35.	Kerala				13 (1)	3, 8, 9 (3)		4, 17, 24, 26 (4)

Kerala. It occurred either at *a few places* or at *isolated places* on : 22 to 27 days in Orissa, Tamil Nadu and Kerala; 13 to 20 days in Andaman & Nicobar Islands, West Bengal & Sikkim and Karnataka; 5 to 12 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Jharkhand, Jammu & Kashmir, east Madhya Pradesh, Madhya Maharashtra, Marathwada, Vidarbha, Chattisgarh, Telangana and Rayalaseema and on 1 to 4 days in Bihar, east Uttar Pradesh, Uttarakhand, Haryana, Punjab, Himachal Pradesh, Rajasthan, west Madhya Pradesh, Saurashtra & Kutch, Konkan & Goa and Lakshadweep.

Rainfall was : *excess* in 2 meteorological sub-divisions *viz*., Sub–Himalayan West Bengal & Sikkim and Tamil Nadu; *normal* in 6, *viz.*, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Vidarbha, coastal Karnataka and Kerala; *deficient* in 16, *viz.*, Andaman & Nicobar Islands, Gangetic West Bengal, Orissa, Jharkhand, Bihar, east Uttar Pradesh, Uttarakhand, Punjab, west Rajasthan, east Rajasthan, west Madhya Pradesh, coastal Andhra Pradesh, Telangana; Rayalaseema, north interior Karnataka and south interior Karnataka and scanty in 11 *viz*., west Uttar Pradesh, Haryana, Chandigarh & Delhi, Himachal Pradesh, Jammu & Kashmir, east Madhya Pradesh, Saurashtra & Kutch, Konkan & Goa, Madhya Maharashtra, Marathwada, Chattisgarh and Lakshadweep. There was no rain in Gujarat region.

3.2.2. *Temperature distribution*

From Table 8, *Severe heat wave conditions* prevailed on : 4 to 6 days in parts of Haryana, Chandigarh & Delhi, Punjab and Rajasthan. *Heat wave conditions* prevailed on 16 days in parts of Rajasthan; on 8 to 10 days in Haryana, Chandigarh & Delhi, Punjab and west Madhya Pradesh; on 4 to 6 days in parts of west Uttar Pradesh, Jammu & Kashmir and Madhya Maharashtra and on 1 to 3 days in parts of Sub-Himalayan West Bengal & Sikkim, Orissa, Jharkhand, Bihar, east Uttar Pradesh, east Madhya Pradesh, Gujarat region, Saurashtra & Kutch, Vidarbha, coastal Andhra Pradesh, Telangana and coastal & south interior Karnataka. *Hot day conditions* also prevailed on 5 to 7 days in parts of Haryana, Chandigarh & Delhi, Rajasthan and Madhya Pradesh and on 1 to 3 days in Bihar, Uttar Pradesh, Punjab, Konkan & Goa, Marathwada, coastal Andhra Pradesh and coastal Karnataka.

The month's highest maximum temperature over the plains was 46.2° C recorded at Churu (west Rajasthan) on 30 April 2007.

TABLE 8

Dates of occurrence of heat wave/severe heat wave and various categories of maximum temperatures - April 2007

Sub-division		Dates (Number of days)						
No.	Name	Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
2.	Arunachal Pradesh				1, 16, 30 (3)		9, 23, 27, 28 (4)	
3.	Assam & Meghalaya				1-3, 15-18, 30 (8)	5, 6 (2)	4, 6-13, 21, 22, 25-28 (15)	5, 8, 14, 29 (4)
4.	Naga., Mani., Mizo. and Tri.				1, 3, 4, 17 (4)	5, 6, 20, 30 (4)	11-13, 16, 22-26 (7)	14, 24, 28, 29 (4)
5.	S. H. W. B. & Sikkim		3 (1)		1, 3, 4, 5, 16, 17, 20 (7)	2, 4, 19 (3)	8-14, 23-27 (12)	7, 8, 22, 28, 29 (5)
6.	Gangetic West Bengal				4 (1)	4 (1)	14, 26 (2)	13, 28 (2)
7.	Orissa		25 (1)		3, 4, 8, 12, 21, 23, 24 (7)	5, 7, 13, 26, 27 (5)	8, 10, 11, 16, 17, 19-22 (9)	7-11, 14, 15, 18, 29, 30 (10)
8.	Jharkhand		3, 24 (2)		1-4, 8 (5)	4-7, 25 (5)	15, 17, 19, 20, 22 (5)	11, 29, 30 (3)
9.	Bihar		3 (1)	2 (1)	1-4, 8, 24 (6)	4, 6, 7, 9 (4)	12-15, 25-27 (7)	21, 28, 29 (3)
10.	East Uttar Pradesh		1-3 (3)	22 (1)	1, 2, 3, 7-9, 12, 18, 24, 26 (10)	5, 7, 10-12, 21-23, 25 (9)	9, 14, 19 (3)	
11.	West Uttar Pradesh		1, 2, 15, 16, 30 (5)	18, 23, 24 (3)	1, 2, 8, 12, 14, 18, 26 (7)	3, 12, 13, 24, 25 (5)	17, 19 (2)	
12.	Uttarakhand				1-3, 7-9, 11, 12, 18, 24-29 (15)	5, 6, 10, 13, 15, 16, 21-23, 30 (10)	19 (1)	
13.	Haryana, Chandigarh & Delhi	1, 14, 16-18 (5)	11, 12, 15, 18, 21, 23, 24, 26, 29, 30 (10)	20, 22, 25, 28, 30 (5)	1, 2, 7, 8, 11-13, 16-18, 20-22, 24, 27-29 (17)	6, 7, 9, 10, 22 (5)	4 (1)	
14.	Punjab	15, 17, 20, 25, 30 (5)	16, 18, 21, 23, 24, 28, 29 (8)	25, 30 (2)	1, 2, 8, 10-14, 16-19, 21, 24, 26-29 (18)	6, 7, 9, 22, 23 (5)	4 (1)	
15.	Himachal Pradesh				3, 4, 7, 10-15, 17, 18, 21-26, 28, 30 (19)	5, 6, 8, 9 (4)		
16.	Jammu & Kashmir		23, 28-30 (4)		3, 4, 7, 9-14, 16-28, 30 (23)	5, 6, 8 (3)		
17.	West Rajasthan	14-17, 29, 30 (6)	1, 7, 8, 11, 12, 13, 15-19, 23, 26, 28-30 (16)	14, 22-25, 27, 30 (7)	1, 5, 8, 10-12, 14, 18, 21, 23, 24, 26-30 (16)	2, 6, 9, 13, 19, 20, 22, 24 (8)		2, 3 (2)
18.	East Rajasthan	1, 15, 20, 30 (4)	7, 8, 13, 14, 16-19, 22, 26, 29, 30 (12)	23-25, 27, 30 (5)	1, 2, 6, 8, 9, 11, 12, 14, 18, 21, 23, 24, 26-29 (16)	5, 10, 13, 20, 22, 24 (6)		
19.	West Madhya Pradesh		1, 2, 7, 8, 15, 16, 29, 30 (8)	16, 18, 23-25 (6)	2-4, 6-9, 12-18, 28-30 (17)	4, 5, 10, 11, 19, 20, 23, 24, 27, 28 (10)	21 (1)	
20.	East Madhya Pradesh		2, 9, 15 (3)	9, 18, 22, 23, 25 (5)	1-4, 7-9, 13, 15, 16, 26, 28, 30 (13)	4, 10, 12, 14, 18, 23, 24, 27, 29 (10)	17 (1)	21 (1)
21.	Gujarat Region	17, 19 (2)	6 (1)		1, 4-8, 11, 12, 16-18, 20, 28-30 (14)	4, 14, 19, 21, 28, 29 (6)	25 (1)	14 (1)
22.	Saurashtra & Kutch	5-7 (3)	6 (1)	1-4, 10 (5)	1, 3, 5, 7, 8, 10-12, 15, 16, 18, 21, 30 (13)	2, 9, 13, 14, 18, 22, 24, 26, 28, 29 (11)		14 (1)

TABLE 8 (*Contd.*)

Sub-division No.	Name	Dates (Number of days) Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
23.	Konkan & Goa			3, 4 (2)	1, 5, 6, 8, 20, 21 (6)	4, 7, 17, 21, 23, 25, 26 (7)		
24.	Madhya Maharashtra		1, 5-7, 28, 29 (6)		1-8, 12, 15, 16, 27, 28, 30 (14)	1, 2, 10, 11, 13, 15, 25-27, 29 (10)	22, 23 (2)	
25.	Marathawada			2, 27, 28 (3)	2, 4-6, 8, 17, 28, 30 (8)	3, 11, 14, 29 (4)	20, 21 (2)	22 (1)
26.	Vidarbha		29, 30 (2)		2-6, 8, 9, 14, 15, 27-30 (13)	1, 11-13, 24-26 (7)	20-22 (3)	
27.	Chattisgarh				1, 3-8, 12, 13, 26, 29, 30 (12)	9, 11, 14, 24, 25, 27, 28 (7)	17, 19-22 (5)	15, 18 (2)
28.	Coastal Andhra Pradesh		24, 25 (2)	23 (1)	24, 26 (2)	2, 3, 5, 12, 14, 19, 23, 26, 28, 29 (10)		15 (1)
29.	Telangana		4 (1)		3, 4, 7-9, 26 (6)	6, 10, 11, 25-30 (9)	17, 19-21 (4)	9, 15, 18 (3)
30.	Rayalaseema				3, 4, 8, 26 (4)	6, 7, 10, 11, 26, 27, 29, 30 (8)	21 (1)	16 (1)
31.	Tamil Nadu				1, 4-6, 8, 12, 23, 25, 30 (9)	2, 3, 5, 7, 9, 10-15, 17, 19-22, 24, 26-29 (21)	17 (1)	
32.	Coastal Karnataka		7 (1)	10 (1)	3, 5, 12-14, 16, 17, 21, 22, 26, 27 (11)	1, 9, 10, 11, 13, 15, 19-21, 23, 26, 27, 29, 30 (14)	28 (1)	
33.	North Interior Karnataka		3, 5, 6 (3)		4-6, 8, 17, 26 (6)	1, 2, 11, 12, 25-28 (8)	21 (1)	18 (1)
34.	South Interior Karnataka				3, 5, 6, 8, 12, 15, 26, 28, 30 (9)	2, 4, 10-12, 24-29 (11)	20, 21, 23 (3)	18 (1)
35.	Kerala				5, 8, 22 (3)	1, 3, 4, 7, 14, 17, 19, 20, 21, 26 (10)	11 (1)	

3.2.3. *Disastrous weather events and damage*

According to media and other disaster reports, thunderstorm, squally winds and lightning claimed the lives of 24 people in Bihar, 12 in Assam, 8 in Tamil Nadu, 7 in Karnataka, 5 in West Bengal, 2 each in Sikkim and Vidarbha. Heat wave took a toll of 17 in Bihar. Standing crops in many parts of the country were damaged. Sea water inundated vast areas of coastal Tamil Nadu, claiming a number of Kutcha houses in its wake.

3.3. *May*

3.3.1. *Weather and associated synoptic features*

One Cyclonic Storm 'Akash' (13-15 May) and a Depression (3-5 May) formed over the Bay of Bengal. The tracks of the systems are given in Fig. 2.

(*i*) *Depression over the Bay of Bengal (3 - 5 May 2007)*

A low pressure area became well marked over the north Andaman Sea and neighbourhood on 3rd morning and subsequently concentrated into a Depression inthe evening. It lay centred at: 1200 UTC of 3rd near Lat. 13.5° N / Long. 93.0° E; 0300 UTC of 4th, near Lat. 14.5° N / Long. 93.5° E; 1200 UTC of 4th, near Lat. 15.5° N / Long. 93.5° E and at 2100 UTC of 4th, near Lat. 16.0° N / Long. 94.0° E, close to Arakan coast. Moving in a northeasterly direction, it crossed Arakan coast near Lat. 16.2° N / Long. 94.5° E in the morning hours (between 0100 to 0300 UTC) of 5th; weakened into a well marked low pressure area over central Myanmar and subsequently became unimportant in the same evening.

The lowest Estimated Central Pressure (ECP) was 998 hPa. The maximum estimated mean wind speed was 25 kts.

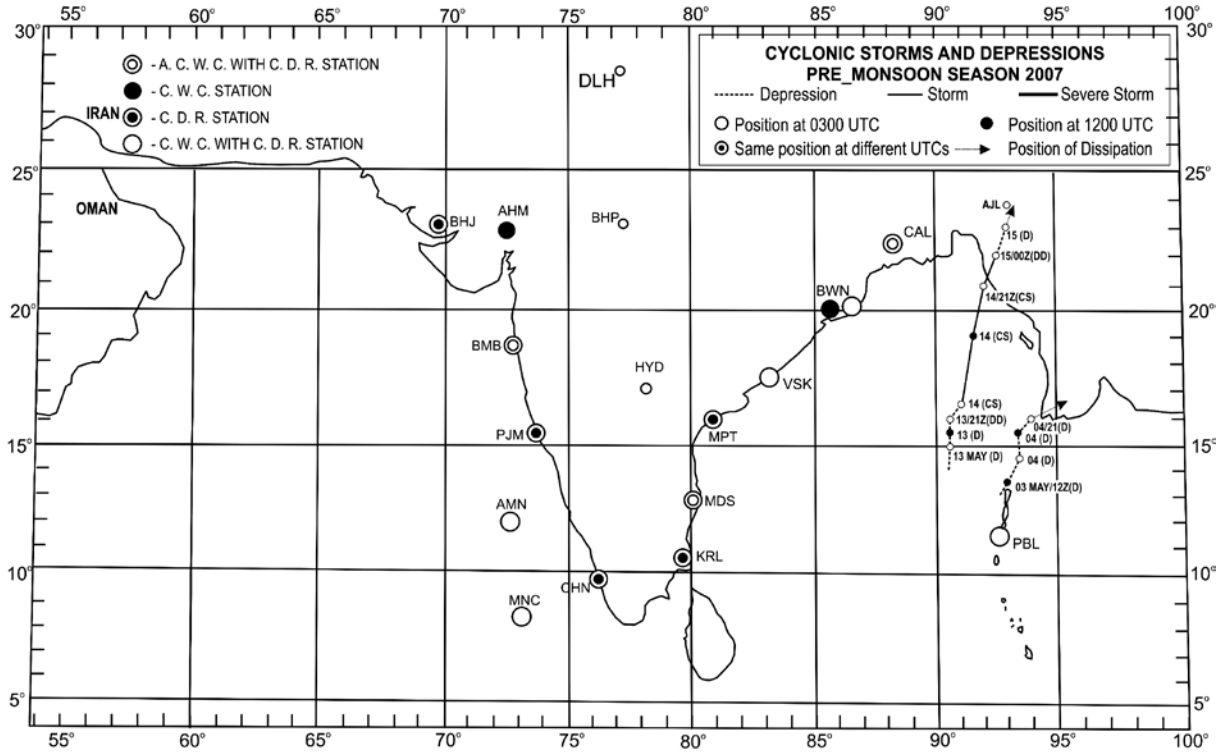

Fig. 2. Track of the systems during 3 – 5 May and 13 – 15 May 2007

Widespread rainfall activity occurred over Andaman & Nicobar Islands from 3 to 5 May with isolated heavy falls on 5th May.

The chief amounts of rainfall are :

4 May : Hut Bay 4, Maya Bandar 3.

5 May : Maya Bandar 7, Hut Bay 3.

The system did not affect the weather in main land.

The system was not tracked by RADAR as it was far away from the coast.

Maximum intensity of T 1.5 was reported by satellite imagery from 1200 UTC of 3 to 2100 UTC of 4th May.

(*ii*) *Cyclonic Storm (Akash) over the Bay of Bengal (13 – 15 May 2007)*

Under the influence of an upper air cyclonic circulation, a low pressure area formed over the east–central Bay and neighbourhood on 11th. It became well–marked on 12th, subsequently concentrated into a Depression and lay centred at 0300 UTC of 13th near Lat. 15.0° N / Long. 90.5° E (about 400 kms northwest of Port Blair) and at 1200 UTC near Lat. 15.5° N / Long. 90.5° E. Moving slowly northwards, it further intensified into a Deep Depression at 2100 UTC of 13th near Lat. 16.0° N / Long. 90.5° E. Then it moved in a northnortheasterly direction and further intensified into a Cyclonic Storm (Akash) and lay centred at 0300 UTC of 14th near Lat. 16.5° N / Long. 91.0° E (about 750 Kms southeast of Kolkata) and at 1200 UTC near Lat 19.0° N / Long. 91.5° E. Continuing its northnortheasterly course, it crossed south Bangladesh coast south of Cox Bazar (near Lat. 21.2° N / Long 92.2° E) in the early morning of 15th and weakened into a Deep Depression over Bangladesh and adjoining Myanmar at 0000 UTC of 15th. It further weakened into a depression and lay centred at 0300 UTC of 15th over Mizoram and adjoining Bangladesh, about 100 Kms south of Aizwal. Further moving northnortheastwards it gradually weakened and lay as a low pressure area over south Assam and adjoining Manipur in the evening of 15th and became less marked on 16th. However, the associated cyclonic circulation extended upto mid tropospheric levels and lay over Bangladesh & adjoining Assam.

The lowest ECP was 988 hPa. The maximum estimated maximum sustained surface wind speed was 45 kts.

Widespread rainfall activity occurred in Nagaland-Manipur-Mizoram-Tripura on 15 and over Assam & Meghalaya on 15 and 16.

Maximum intensity of T-3.0 was reported by satellite imagery from 0800 to 2100 UTC of 14.

Details of the other weather systems during the month are given in Table 4.

3.3.2. *Advance of southwest (SW) monsoon*

SW monsoon arrived over the south Andaman Sea, Nicobar islands and parts of southeast Bay on 10 May, nearly a week ahead of normal (as in 1988). This was associated with the strengthening of the cross equatorial flow, subsequent to the formation of a Depression over the north Andaman Sea (3-5 May) and its dissipation over Myanmar.

However, the subsequent advance was delayed by the formation of a cyclonic storm, 'Akash' (13 - 15 May) which had an unusual origin in the mid latitude westerlies. It formed over the eastcentral Bay and crossed Bangla Desh coast. It disrupted the monsoon flow by prolonging the mid-latitude westerly intrusion over the Bay of Bengal.

Subsequent to a gradual revival, monsoon onset took place over Kerala on 28 May. The monsoon covered some parts of coastal & south interior Karnataka and Tamil nadu by the end of the season.

3.3.3. *Weather realised*

The principal amounts of rainfall are given in Table 5. *Very heavy rain* occurred on 1 to 2 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Tamil Nadu, south interior Karnataka and Kerala. *Heavy rain* also occurred on 4 to 8 days in Andaman & Nicobar Islands, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim and Kerala and on 1 to 3 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, Bihar east Uttar Pradesh, east Madhya Pradesh, Rayalaseema, Tamil Nadu, Karnataka and Lakshadweep.

The southwest monsoon was *vigorous* on 1 day in Kerala and active on 1 day in coastal Karnataka. Rain or thundershowers occurred either *at many places* or *at most places* on : 16 days in Andaman & Nicobar Islands, 8 to 11 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim and Kerala; on 4 to 7 days in Gangetic West Bengal, coastal Karnataka and Lakshadweep and on 1 to 3 days in Orissa, Jharkhand, Uttarakhand, Himachal Pradesh, Jammu & Kashmir and interior Karnataka. It occurred either at *isolated places* or *at a few places* on: 24 to 27 days in Orissa, coastal Andhra Pradesh and Tamil Nadu; on 14 to 21 days in Andaman & Nicobar Islands, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Jharkhand, Bihar, west Uttar Pradesh, Uttarakhand, Himachal Pradesh, Jammu & Kashmir, west Madhya Pradesh, Chattisgarh, Telangana, Rayalaseema and south interior Karnataka; on 5 to 13 days in Arunachal Pradesh, east Uttar Pradesh, Haryana, Punjab, Rajasthan, east Madhya Pradesh, Maharashtra & Goa states, coastal Karnataka, Kerala and Lakshadweep and on 1 day in Gujarat region.

Rainfall was *excess* in 3 met. Sub-divisions, *viz*., east Uttar Pradesh, Haryana, Chandigarh & Delhi and east Madhya Pradesh; *normal* in 12, *viz*., Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Orissa, Jharkhand, west Uttar Pradesh, Uttarakhand, Jammu & Kashmir, west Madhya Pradesh, Chattisgarh and Lakshadweep and *deficient* in 15, *viz*., Arunachal Pradesh, Assam & Meghalaya, Bihar, Punjab, Himachal Pradesh, Konkan & Goa, Vidarbha, coastal Andhra Pradesh Telangana, Rayalaseema, Tamil Nadu, coastal Karnataka, north interior Karnataka, south interior Karnataka and Kerala and scanty in 5, *viz.*, west Rajasthan, east Rajasthan, Gujarat region, Madhya Maharashtra and Marathwada.

There was no rain in Saurashtra & Kutch.

3.3.4. *Temperature distribution*

From Table 9, *severe heat wave conditions* prevailed on 5 days in coastal Andhra Pradesh and on 1 day each in Haryana, Chandigarh & Delhi, Punjab and west Rajasthan. *Heat wave conditions* prevailed on 16 days in parts of Vidarbha; 8 to 11 days in parts of Jammu & Kashmir, west Rajasthan, west Madhya Pradesh, coastal Andhra Pradesh and Tamil Nadu; on 4 to 6 days in Bihar, east Rajasthan and Madhya Maharashtra and on 1 to 3 days in Sub-Himalayan West Bengal & Sikkim, Jharkhand, Haryana, Chandigarh & Delhi, Punjab, east Madhya Pradesh, Gujarat region and Telangana. *Hot day conditions* prevailed on 4 days in coastal Karnataka and on 1 to 3 days in Jharkhand, Bihar, Haryana, Chandigarh & Delhi, Punjab, Rajasthan, east Madhya Pradesh, Marathwada, Vidarbha, coastal Andhra Pradesh, Telangana and Tamil Nadu.

The month's as well as the season's highest maximum temperature of 47.0° C was recorded at Khammam (Telangana) on 21 May.

TABLE 9

Dates of occurrence of heat wave/severe heat wave and various categories of maximum temperatures - May 2007

Sub-division No.	Name	Dates (Number of days)						
		Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
2.	Arunachal Pradesh				1, 2, 4-6, 20, 22, 27 (8)	31 (1)	25 (1)	
3.	Assam & Meghalaya				1-4, 6, 8, 9, 12-14, 20-23, 25, 31 (15)	11, 18, 31 (3)	15, 16, 24, 28 (4)	
4.	Naga., Mani, Mizo and Tri.				1-3, 6 (4)	4, 5, 11, 13, 20, 29, 30, 31 (6)	15, 16, 24, 25 (4)	14 (1)
5.	S. H. W. B. & Sikkim		24, 25, 31 (3)		2-7, 9, 20, 21, 24, 25, 29, 30 (13)	8, 10, 14, 18, 19, 22, 31(6)	13, 16, 23 (3)	17 (1)
6.	Gangetic West Bengal				2, 30, 31 (3)	28 (1)	9, 10, 16, 19 (4)	17, 21 (2)
7.	Orissa				11 (1)	1, 3, 4, 6, 8, 12, 13, 19, 20, 22-25, 28, 30, 31 (16)	2-7, 9-11, 14-16, 18-20, 23 (16)	1, 7, 12, 13 (4)
8.	Jharkhand		28 (1)	26 (1)	27 (1)	25, 28, 29 (3)	1-11, 13-16, 18-21, 24 (20)	12 (1)
9.	Bihar		7, 24, 25, 31 (4)	27 (1)	26, 27 (2)	24, 25, 28, 29, 31 (5)	1-3, 8-11, 13, 15, 16, 18-21 (13)	6, 12 (2)
10.	East Uttar Pradesh					25, 26 (2)	2, 5-14, 16, 18-21 (16)	1, 3, 15, 27 (4)
11.	West Uttar Pradesh						3, 5, 6, 12, 14, 16, 18-20, 28, 30 (11)	7-9, 15, 21, 27, 29, 31 (8)
12.	Uttarakhand					12, 22, 25, 27 (4)	3, 15, 18, 27, 28 (5)	4, 5, 8-10, 14, 19, 20, 30 (9)
13.	Haryana, Chandigarh & Delhi	1 (1)	16, 19 (2)	2, 4, 15 (3)	2, 16 (2)	6, 12, 15, 31 (4)	3, 5, 8, 13, 14, 18, 21, 27, 28 (9)	3, 5, 10, 19, 20, 29, 30 (7)
14.	Punjab	1 (1)	2, 3 (2)	16 (1)	8 (1)	6, 15, 16, 19, 22 (5)	12-14, 27-29, 30 (6)	4, 5, 10, 17, 31 (5)
15.	Himachal Pradesh				1, 2, 6-8, 10, 16 (7)	4, 12, 15, 17, 19, 22, 25, 27 (8)	3, 27 (2)	14, 29 (2)
16.	Jammu & Kashmir		1, 2, 7, 8, 15-17, 19 (8)		3, 5-9, 13, 14, 16, 18 (10)	10, 11, 17, 18, 27 (5)	4, 22, 23, 26, 27, 29, 30 (7)	12, 22, 24 (3)
17.	West Rajasthan	1 (1)	1-4, 7, 8, 14-17, 19 (11)	6, 9, 10 (3)	1, 3, 4, 6-9, 11, 12, 16 (10)	5, 9, 10, 18, 25 (5)	21, 30 (2)	16, 17, 20, 22-24, 26-29, 31 (11)
18.	East Rajasthan		1-6 (6)	7, 9 (2)	1-12 (12)	9, 14-16, 18, 20, 25, 26 (8)	30, 31 (2)	24, 27-29 (4)
19.	West Madhya Pradesh		1, 2, 11, 12 (4)		1, 2, 4, 5, 11 (5)	10, 12-15 (5)	10, 18, 21, 30 (4)	9, 22, 23, 31 (4)
20.	East Madhya Pradesh		1, 12 (2)	4 (1)	1 (1)	2, 12, 14 (3)	10, 18, 30 (3)	6, 9, 19, 23, 31 (5)
21.	Gujarat Region		2, 3 (2)		3 (1)	2, 7 (2)	16 (1)	9, 10, 13-23, 25, 30 (15)
22.	Saurashtra & Kutch				3, 28, 29 (3)	1, 2, 5-10, 14-16, 19, 22-26, 30, 31 (19)		

TABLE 9 (*Contd.*)

Sub-division No.	Name	Dates (Number of days) Severe Heat wave	Heat wave	Hot Day	Appreciably to markedly above normal	Above normal	Appreciably to markedly below normal	Below normal
23.	Konkan & Goa				4, 8, 10, 17, 27, 28 (6)	2, 5, 9, 22-24, 26, 27 (8)		
24.	Madhya Maharashtra		2-5 (4)		1-3, 4, 6, 7 (6)	3, 6, 12, 13, 24 (5)	11, 14, 16, 29, 30, 31 (6)	8, 9, 15, 17, 21-23, 29, 30 (9)
25.	Marathawada			2, 6 (2)	1, 4 (2)	6, 8, 9, 11-13 (6)	30 (1)	14, 16, 21-23 (5)
26.	Vidarbha		1-6, 10-15, 18, 19, 27, 29 (16)	10 (1)	1-6 (6)	11-13, 15, 25, 27, 29(7)	30 (1)	7, 16, 23 (3)
27.	Chattisgarh		27 (1)		16, 22-24, 27 (5)	1, 15, 26, 28, 29 (5)	7, 9, 23, 30 (4)	5, 6, 20, 30 (4)
28.	Coastal Andhra Pradesh	16, 18, 20-22 (5)	10-16, 18, 21, 23, 24 (11)	30 (1)	12, 13, 15, 18-22, 24, 26, 27, 29, 31 (13)	1, 7, 8, 14, 28, 30 (6)	4, 25 (2)	8 (1)
29.	Telangana		11, 18 (2)	10 (1)	12, 13, 27, 28 (4)	1, 2, 10-15, 18, 20, 23, 24, 26 (13)	25, 30 (2)	
30.	Rayalaseema				14 (1)	1, 2, 12, 15, 16, 20, 23, 24 (8)	6, 8 (2)	6, 28, 30 (3)
31.	Tamil Nadu		10-13, 15-18, 20-22 (11)	30 (1)	2, 8, 9, 11-13, 15, 17-24, 26, 27, 29 (18)	1-7, 9, 10, 14, 23, 28 (12)	10 (1)	4, 25, 29 (3)
32.	Coastal Karnataka			18-21 (4)	1, 4, 6, 9, 10, 12, 13, 15, 17, 18, 25, 27, 31 (13)	2, 8, 14, 16, 19, 20, 22-24, 26, 28 (11)		
33.	North Interior Karnataka				22 (1)	12, 14, 15, 24 (4)	11, 30 (2)	5, 13, 28 (3)
34.	South Interior Karnataka				2, 18, 23, 24, 28 (5)	1, 7, 14, 15, 20, 22 (6)	4, 8, 29 (3)	5, 10, 13, 25 (4)
35.	Kerala				24, 27 (2)	1, 5, 6, 10, 19, 20, 22, 23, 25-27 (11)	10 (1)	

3.3.5. *Disastrous weather events and damage*

According to media and other disaster reports, thunderstorms, squally winds and lightning claimed the lives of 28 people in Tamil Nadu, 12 in Vidarbha, 4 in Maharashtra, 2 each in Assam and Jammu & Kashmir and 1 in Kerala. In Karnataka, roads were flooded and trees uprooted due to heavy rain. Heat wave took a toll of 7 lives in Assam and 3 in Orissa (taking the toll to 11) and 2in Uttar Pradesh.

Appendix

Definitions of the terms given in '*Italics*'

Rainfall

Excess - percentage departure from normal rainfall is + 20% or more.

Normal - percentage departure from normal rainfall is from – 19 % to + 19 %.

Deficient - percentage departure from normal rainfall is from – 20 % to – 59 %.

Scanty - percentage departure from normal rainfall is from – 60 % to – 99 %.

At most places - 76 % or more stations of a meteorological sub-division reporting atleast 2.5 mm rainfall.

At many places - 51% to 75 % stations of a meteorological sub-division reporting atleast 2.5 mm rainfall.

At a few places - 26 % to 50% stations of a meteorological sub-division reporting atleast 2.5 mm rainfall.

At isolated places - 25% or less stations of a meteorological sub-division reporting at least 2.5 mm rainfall

Extremely heavy rain - rainfall amount 24.5 cm or more.

Very heavy rain - rainfall amount from 12.5 cm to 24.4 cm.

Heavy rain - rainfall amount from 6.5 cm to 12.4 cm.

Monsoon activity

Active - Average rainfall of a sub-division is more than 1 ½ to 4 times the normal with minimum 5 cm along the west coast and 3 cm elsewhere in atleast two stations in the sub-division.

Vigorous - Average rainfall of a sub-division is 4 times or more, than the normal with minimum 7 cm along the west coast and 5 cm elsewhere in atleast two stations in the sub-division.

Temperature

(a) Maximum/day temperatures

According to the new 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 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.

Markedly above normal - departure of maximum temperature from normal is + 5° C to + 6° C for the region where the normal maximum temperature is 40° C or less.

Appreciably above normal - departure of maximum temperature from normal is between + 3° C to + 4° C for the region where the normal maximum temperature is 40° C or less.

Above normal - departure of maximum temperature from normal is + 2° C.

Appreciably below normal - departure of maximum temperature from normal is from – 3° C to – 4° C where the normal maximum temperature is 40° C or less

Markedly below normal - departure of maximum temperature from normal is from – 5° C to – 6° C where the normal maximum temperature is 40° C or less.

Below normal - departure of maximum temperature from normal is – 2° C.

(b) Minimum/night temperatures

Cold wave conditions - departure WCTn from normal minimum temperature is from –5° C to –6° C where normal minimum temperature $\underline{\geq}$ 10° C and from –4° C to –5° C elsewhere.

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

Severe cold wave conditions - departure of WCTn from normal minimum temperature is –7° C or less for the regions where normal minimum temperature is $\underline{\geq}$ 10° C and –6° C or less elsewhere.

Appreciably below normal - departure of minimum temperature from normal is from – 3° C to – 4° C for the region where the normal minimum temperature is 10° C or more.

Markedly below normal - departure of minimum temperature from normal is – 5° C to – 6° C where the normal minimum temperature is 10° C or more.

Below normal - departure of minimum temperature from normal is – 2° C

Markedly above normal departure of minimum temperature from normal is from + 5° C to + 6° C.

Appreciably above normal - departure of minimum temperature from normal is from + 3° C to + 4° C.