MAUSAM, **58**, 2 (April 2007), 287-304

Weather in India

HOT WEATHER SEASON (March – May 2006)*

1. Chief features

(*i*) The hot weather season of 2006 witnessed the formation of a very severe cyclonic storm "MALA" over the Bay of Bengal during 25-29 April, which followed the climatological track and crossed Arakan coast.

(*ii*) The heat wave conditions manifested over various parts from 3rd week of March and continued almost unabated throughout the season, only with brief spells of respite due to thundershower activity.

(*iii*) Most parts of the country experienced thundershower activity during the first fortnight of March and third week of April.

(*iv*) Southwest monsoon onset took place over Kerala on 26 May. It advanced rapidly over parts of Maharashtra, Karnataka and Andhra Pradesh by 31 May. It also brought forth some of the exceptionally heavy rainfall amounts along the west coast like Karwar (44 cm) on 30 May and Ratnagiri (64 cm) on 31 May.

2. Seasonal rainfall

Season's rainfall was: *excess*† in 23 meteorological sub-divisions *viz.*, Andaman & Nicobar Islands, Orissa, Jharkhand, east Uttar Pradesh, west Uttar Pradesh, Uttaranchal, Haryana, Punjab, east Rajasthan, west Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Konkan & Goa, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Telangana, Rayalaseema, coastal Karnataka, north interior Karnataka, south interior Karnataka, Kerala and Lakshadweep; *normal* in 4 *viz.*, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal and Tamil Nadu; *deficient* in 6, *viz.*, Arunachal Pradesh, Assam & Meghalaya, Bihar, Himachal Pradesh, Jammu & Kashmir and Marathwada and *scanty* in the remaining 3 *viz.*, Gujarat Region, Saurashtra & Kutch and Madhya Maharashtra. 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 2006 are shown in Fig. 1.

† Definitions of the terms in *Italics* other than sub-titles are given in Appendix.

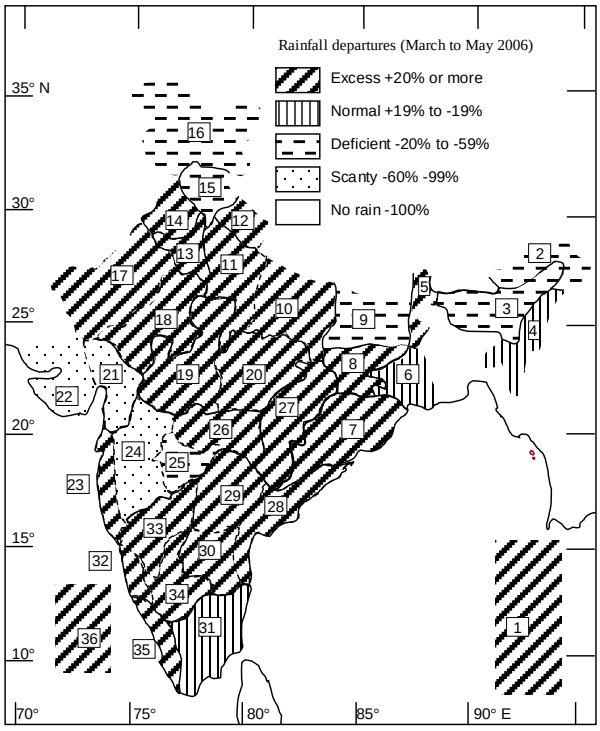

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for the period (March - May 2006). 36 Sub-divisions are indicated by numbers on the map & bold letters in legend below. The rainfall anomaly values for these sub-divisions are indicated below :

1	22	**7**	50	**13**	116	**19**	337	**25**	–58	**31**	17
2	–40	**8**	35	**14**	22	**20**	229	**26**	354	**32**	137
3	–34	**9**	–28	**15**	–41	**21**	–96	**27**	134	**33**	37
4	1	**10**	68	**16**	–34	**22**	–62	**28**	66	**34**	31
5	2	**11**	97	**17**	27	**23**	369	**29**	159	**35**	58
6	13	**12**	54	**18**	30	**24**	–64	**30**	58	**36**	95

3. Significant features during different months

3.1. *March*

3.1.1. *Weather and associated synoptic features*

The country experienced widespread thundershower activity in the first fortnight of the month due to the interaction between easterly and westerly troughs. With

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TABLE 1

Sub-divisionwise rainfall (mm) for each month and season as a whole (March - May 2006)

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	48.6	19.0	155	172.0	69.0	149	342.5	372.9	-8	563.1	461.0	22
2.	Arunachal Pradesh	33.8	158.2	-79	195.8	276.5	-29	201	284.8	-29	430.5	719.5	-40
3.	Assam & Meghalaya	16.3	83.6	-81	163.0	201.5	-19	272.9	396.4	-31	452.2	681.5	-34
4.	Nagaland-Manipur-Mizoram-Tripura	3.6	64.8	-94	124.5	149.1	-17	317.6	229.4	38	445.7	443.3	1
5.	Sub-Himalayan West Bengal & Sikkim	31.6	54.6	-42	112.8	116.5	-3	293.6	258.6	14	438.1	429.7	2
6.	Gangetic West Bengal	9.1	27.4	-67	49.1	46.2	6	130.2	93.1	40	188.3	166.7	13
7.	Orissa	37.8	24.8	52	31.7	36.1	-12	111	59.6	86	180.5	120.6	50
8.	Jharkhand	23.3	20.0	16	13.7	22.2	-38	84.1	47.6	77	121.1	89.7	35
9.	Bihar	5.9	11.2	-47	14.8	19.4	-23	42	56.5	-26	62.8	87.1	-28
10.	East Uttar Pradesh	13.6	9.6	42	11.4	6.1	88	30.4	17.5	74	55.4	33.1	68
11.	West Uttar Pradesh	23.0	11.5	101	2.0	4.8	-58	32.1	12.7	152	57.2	29.0	97
12.	Uttaranchal	58.8	59.5	-1	16.0	35.5	-55	166.9	62	169	241.7	157.0	54
13.	Haryana, Chandigarh & Delhi	39.3	13.5	190	1.6	7.2	-78	33.6	13.7	145	74.5	34.4	116
14.	Punjab	38.2	26.7	43	1.4	12.1	-88	26.6	15.6	71	66.2	54.4	22
15.	Himachal Pradesh	66.9	114.8	-42	26.4	66.1	-60	51.4	65.7	-22	144.7	246.6	-41
16.	Jammu & Kashmir	125.9	169.5	-26	58.6	99.7	-41	44.9	76.5	-41	229.4	345.7	-34
17.	West Rajasthan	12.1	3.8	220	1.0	3.3	-69	8.7	10	-13	21.8	17.1	27
18.	East Rajasthan	8.4	3.9	115	0.1	2.6	-95	14	10.8	29	22.5	17.3	30
19.	West Madhya Pradesh	44.2	5.0	791	1.7	2.1	-21	17.2	7.3	134	63.1	14.4	337
20.	East Madhya Pradesh	54.0	13.9	289	14.4	6.1	135	23.9	8	197	92.3	28.1	229
21.	Gujarat region	0.4	1.3	-71	0.0	1.3	-100	0	6	-100	0.4	8.6	-96
22.	Saurashtra & Kutch	1.8	1.3	37	0.0	1.1	-100	0	2.3	-100	1.8	4.7	-62
23.	Konkan & Goa	2.9	0.3	943	0.0	3.7	-99	184.9	36.2	411	187.9	40.1	369
24.	Madhya Maharashtra	1.1	3.2	-67	0.2	9.9	-98	13.7	28.3	-52	15.0	41.4	-64
25.	Marathwada	3.7	6.1	-40	1.1	6.7	-84	9.4	20.5	-54	14.2	33.4	-58
26.	Vidarbha	78.0	12.4	528	28.4	7.9	262	35.9	11	225	142.4	31.3	354
27.	Chattisgarh	37.2	15.7	137	41.1	16.5	150	46.5	21.1	120	124.7	53.3	134
28.	Coastal Andhra Pradesh	40.9	12.5	228	55.3	22.1	150	60.5	59.8	1	156.7	94.4	66
29.	Telangana	47.2	9.9	376	47.6	16.6	188	49.5	29.2	70	144.4	55.7	159
30.	Rayalaseema	36.6	6.5	460	9.8	17.9	-45	77	53.7	43	123.5	78.2	58
31.	Tamil Nadu	56.5	19.5	189	34.4	42.7	-19	59.8	66.7	-10	150.7	128.9	17
32.	Coastal Karnataka	6.1	4.2	45	3.4	27.4	-88	414.9	147.7	181	424.4	179.4	137
33.	North interior Karnataka	17.3	6.2	179	12.5	26.0	-52	91	55.7	63	120.7	87.9	37
34.	South interior Karnataka	42.4	8.8	380	26.2	44.2	-41	127.6	97.3	31	196.2	150.4	31
35.	Kerala	80.1	37.9	111	73.0	121.7	-40	521.2	268.2	94	674.3	427.8	58
36.	Lakshadweep	44.0	12.5	252	0.3	43.0	-99	411.3	178.2	131	455.6	233.7	95

** 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 2006

S. No. (1)	System (2)	Duration (3)	Place of first location (4)	Direction of movement (5)	Final Location (6)	Remarks (7)
(**A**)	*Western disturbances /Eastward moving systems*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Upto mid tropospheric levels	1 – 7	North Pakistan and adjoining Jammu & Kashmir	Northeast	Eastern parts of Jammu & Kashmir	Moved away on 8
2.	Do	8 – 12	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Moved away on 13
3.	Do	13 – 16	North Pakistan and adjoining Jammu & Kashmir	Do	Eastern parts Jammu & Kashmir	Moved away on 17
4.	Do	19 – 21	North Pakistan and adjoining Jammu & Kashmir	Do	Northern parts of Jammu & Kashmir	Moved away on 22
5.	Do	22 – 25	Northeast Afghanistan and adjoining north Pakistan	Do	Jammu & Kashmir and neighbourhood	Moved away on 26
6.	Do	27 – 28	North Pakistan and adjoining Jammu & Kashmir	Do	Northern parts of Jammu & Kashmir	Moved away on 29
7.	Do	31 Mar – 4 Apr	Afghanistan and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away on 5 April
(*ii*)	*As an induced cyclonic circulation*					
1.	Upto mid tropospheric levels	4 – 7	West Rajasthan and adjoining Pakistan	Northeast	Haryana and neighbourhood	Less marked on 8
2.	Do	11 – 12	Rajasthan and adjoining Haryana	Do	West Uttar Pradesh and adjoining Haryana	Less marked on 13
3.	Do	14 – 15	Northwest Rajasthan and neighbourhood	Do	Haryana and adjoining west Uttar Pradesh	Moved away on 16
4.	Do	25 – 28	Central Pakistan and adjoining west Rajasthan	Do	Central Pakistan and adjoining Punjab and neighbourhood	Less marked on 29
5.	Do	30 – 31	Punjab and adjoining Jammu Kashmir	Stationary	*In situ*	Less marked on 1 April
(**B**)	*Other upper air cyclonic circulations*					
1.	Lower tropospheric levels	1 – 3	West Uttar Pradesh and neighbourhood	Stationary	*In situ*	Less marked on 4
2.	Do	8	West Madhya Pradesh and neighbourhood	Do	Do	Less marked on 9
3.	Do	30 Mar – 1 Apr	Tamil Nadu and adjoining Commorin area	Quasi–stationary	Sri Lanka and adjoining south Tamil Nadu	Less marked on 2 April

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**C**)	*Troughs in easterly*					
1.	Trough of low (at sea level)	1 – 4	Southwest Bay	West	Lakshadweep–Maldives areas	Less marked on 5
2.	Lower levels	8	Kerala to Telangana	Stationary	*In situ*	Less marked on 16
3.	Trough of low (at sea level)	12 – 20	Southeast Bay	West	Lakshaweep–Maldives areas	Less marked on 21
4.	Do	17	South Andaman Sea	Stationary	*In situ*	Less marked on 18
5.	Do	20 – 25	South Andaman Sea	Quasi–stationary	Southeast Bay	Less marked on 26
6.	Do	23 – 25	Southeast Bay and adjoining south Andaman Sea	West	Southeast Bay	Less marked on 26
7.	Do	26 – 29	South Andaman Sea	Northnorthwest	North Andaman Sea	Less marked on 30
(**D**)	*Troughs in westerly*					
1.	At 9.5 kms a.s.l.	8 – 12	Along Long. 70° N, north of Lat. 20° N	East	Long. 86° N	Less marked on 13
2.	Lower levels	16 – 17	Sub-Himalayan West Bengal & Sikkim to Chattisgarh	Southeast	Gangetic West Bengal to coastal Andhra Pradesh	Less marked on 18
3.	Do	31 Mar – 1 Apr	Arunachal Pradesh to north Bay	East	Chattisgarh to south Tamil Nadu	Less marked on 2 April
(**E**)	*Trough / wind discontinuity*					
1.	At lower tropospheric levels	9 – 17	South Rajasthan to coastal Karnataka	Oscillatory	Chattisgarh to south Tamil Nadu	Less marked on 18
2.	Do	22 – 25	Sub-Himalayan West Bengal & Sikkim to Telangana	Do	Sub-Himalayan West Bengal & Sikkim to north Bay	Less marked on 26
3.	Do	26 – 29	North interior Karnataka to south Tamil Nadu	Do	Chattisgarh to south Tamil Nadu	Less marked on 30
4.	Do	28	Assam & Meghalaya to north Bay	Stationary	*In situ*	Less marked on 29
5.	Do	31 Mar – 28 Apr	West Madhya Pradesh to south Tamil Nadu	Oscillatory	Chattisgarh to south Tamil Nadu	Less marked on 29 April

the reduction of the rainfall activity, *heat wave conditions* started manifesting in isolated pockets of Orissa and Jharkhand towards the later part of the month.

Details of weather systems during the month are given in Table 2.

Very heavy rain occurred on one day each in Vidarbha, coastal Andhra Pradesh and Tamil Nadu. *Heavy rain* occurred on 7 days in Tamil Nadu and on 1 to 3 days in Uttaranchal, Punjab, Himachal Pradesh, Vidarbha, coastal Andhra Pradesh, south interior Karnataka and Kerala.

Rain or thundershowers occurred either *at most places* or *at many places* on: 4 to 8 days in Orissa, Himachal Pradesh, Jammu & Kashmir, east Madhya Pradesh and on 1 to 3 days in Arunachal Pradesh, Sub-

TABLE 3

Details of the weather systems during April 2006

S. No. (1)	System (2)	Duration (3)	Place of first location (4)	Direction of movement (5)	Final Location (6)	Remarks (7)
(**A**)	*Cyclonic storm*					
1.	Very severe cyclonic Storm (MALA)	25 – 29	South Andaman Sea	Northwest, northnortheast and northeast	Arakan coast	It was first observed as a trough of low over south Andaman Sea on 20 Details of the system are given in the text
(**B**)	*Western Disturbances /Eastward moving systems*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Upto mid tropospheric levels	7 – 12	Jammu & Kashmir and adjoining Pakistan	Northeast	Jammu & Kashmir	Moved away on 13
2.	Do	14 – 18	Central Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and adjoining north Pakistan	Moved away on 19
3.	Do	19	North Pakistan and adjoining Jammu & Kashmir	Do	Northern parts of Jammu & Kashmir	Moved away on 20
4.	Do	23	North Pakistan and adjoining Jammu & Kashmir	Do	Do	Moved away on 24
5.	Do	29 Apr – 3 May	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Moved away on 4 May
(*ii*)	*As an induced cyclonic circulation*					
1.	Lower tropospheric levels	1 – 3	Central Pakistan and adjoining west Rajasthan	Northeast	West Rajasthan, Haryana and Punjab	Moved away on 4
2.	Lower levels	5 – 6	Central Pakistan and adjoining northwest Rajasthan	Do	Northwest Rajasthan	Less marked on 7
3.	Lower tropospheric levels	8	Northwest Rajasthan	Stationary	*In situ*	Less marked on 9
4.	Mid tropospheric levels	8 – 10	central Pakistan and neighbourhood	Northeast	Punjab and Haryana	Less marked on 11
5.	Lower tropospheric levels	11	West Rajasthan and adjoining Pakistan	Stationary	*In situ*	Less marked on 12
6.	Mid tropospheric levels	15 – 17	Northwest Rajasthan and adjoining Pakistan	Northeast	Punjab, Haryana and neighbourhood	Less marked on 18
7.	Do	18	Punjab and adjoining Pakistan	Stationary	*In situ*	Less marked on 19
8.	Lower tropospheric levels	19 – 20	West Rajasthan and adjoining central Pakistan	Northeast	West Rajasthan and adjoining Haryana & Punjab	Less marked on 21
9.	Mid tropospheric levels	23 – 24	Central Pakistan and adjoining west Rajasthan	Do	Punjab, Haryana and neighbourhood	Less marked on 25

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
10.	Lower levels	28 – 29	West Uttar Pradesh and neighbourhood	Do	East Uttar Pradesh and adjoining west Uttar Pradesh	Less marked on 30
11.	Mid tropospheric levels	28	Punjab and adjoining Pakistan	Stationary	*In situ*	Less marked on 29
12.	Do	30	West Rajasthan and adjoining Punjab	Do	Do	Less marked on 1 April
(**C**)	*Other upper air cyclonic circulations*					
1.	Lower levels	11 – 21	Assam & Meghalaya	Southeast	Nagaland-Manipur-Mizoram-Tripura	Less marked on 22
2.	Mid tropospheric levels	17	North coastal Andhra Pradesh and adjoining Orissa	Stationary	*In situ*	Less marked on 18
3.	Lower levels	22 – 26	Gangetic West Bengal and adjoining Bihar and Jharkhand	West	East Uttar Pradesh	Less marked on 27
4.	Mid tropospheric levels	22 – 23	Southwest Bay off Sri Lanka–Tamil Nadu coasts	Stationary	*In situ*	Less marked on 24
5.	Do	28 – 29	Gujarat Region and neighbourhood	Do	Do	Less marked on 30
6.	Do	30	Nagaland-Manipur-Mizoram-Tripura and adjoining Bangla Desh	Do	Do	Less marked on 1 May
(**D**)	*Troughs in westerly*					
1.	Lower levels	5	Bihar to northwest Bay	Stationary	*In situ*	Less marked on 6
2.	Mid and upper tropospheric levels	17 – 18	Along Long. 70° N, north of Lat. 20° N	East	Along Long. 79° N, north of Lat. 20° N	Less marked on 19
3.	Lower tropospheric levels	11 – 15	Sub-Himalayan West Bengal & Sikkim to northwest Bay	Do	Sub-Himalayan West Bengal & Sikkim to northwest Bay	Less marked on 16
(**E**)	*East–West Troughs*					
1.	Lower levels	2 – 4	Chattisgarh to Arunachal Pradesh	Oscillatory	East Madhya Pradesh to Nagaland-Manipur-Mizoram-Tripura	Less marked on 5

Himalayan West Bengal & Sikkim, Jharkhand, Bihar, Uttar Pradesh, Haryana, west Madhya Pradesh, Vidarbha, Chattisgarh, Telangana, Rayalaseema, Tamil Nadu, interior Karnataka, Kerala and Lakshadweep. It occurred either *at a few places* or *at isolated places* on: 21 days in Tamil Nadu and 19 days in Kerala; 9 to 14 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, West Bengal & Sikkim, Orissa, Madhya Pradesh, Chattisgarh, coastal Andhra Pradesh, Rayalaseema and coastal & south interior Karnataka; 4 to 8 days in Jharkhand, Uttar Pradesh, Uttaranchal, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Maharashtra, Marathwada, Vidarbha, Telangana and north interior Karnataka and on 1 to 3 days in Nagaland-Manipur-Mizoram-Tripura, Bihar, Gujarat State, Konkan & Goa and Lakshadweep.

TABLE 4

Details of the weather systems during May 2006

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 cyclonic circulations*					
(*i*)	*As an upper air cyclonic circulation*					
1.	Upto mid tropospheric levels	5 – 8	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir	Moved away on 9
2.	Do	8 – 11	Do	Do	Jammu & Kashmir and neighbourhood	Moved away on 12
3.	Do	12 – 15	Do	Do	Do	Moved away on 16
4.	Do	17 – 18	Jammu & Kashmir and adjoining north Pakistan	Do	Jammu & Kashmir	Moved away on 19
5.	Do	19 – 25	Do	Do	Do	Moved away on 26
(*ii*)	*As an induced cyclonic circulation*					
1.	Upto mid tropospheric levels	1 – 3	Central Pakistan and adjoining west Rajasthan	Stationary	*In situ*	Less marked on 4
2.	Lower levels	5 – 9	Do	Northeast	West Uttar Pradesh and neighbourhood	Less marked on 10
3.	Lower tropospheric levels	11 – 13	Northwest Rajasthan	Do	Punjab and neighbourhood	Less marked on 14
4.	Mid tropospheric levels	15 – 19	Punjab and adjoining west Rajasthan	Do	West Uttar Pradesh	Less marked on 20
5.	Do	17 May – 3 Jun	Southwest Rajasthan and adjoining Gujarat Region	Do	Northwest Madhya Pradesh and adjoining east Rajasthan	Less marked on 4 June
6.	Lower tropospheric levels	19 – 26	Central Pakistan and adjoining northwest Rajasthan	Do	Punjab and neighbourhood	Less marked on 27
(7)	Do	27 – 30	Northwest Rajasthan	Do	Bihar and neighbourhood	Less marked on 31
(**B**)	*Other cyclonic circulations*					
1.	Upto mid tropospheric levels	1 – 5	Central parts of Bay of Bengal	West	Lakshadweep	Became unimportant on 6
2.	Lower levels	1 – 3	Eeast Uttar Pradesh	Northwest	Uttaranchal and neighbourhood	Less marked on 4
3.	Do	6 – 11	Gangetic West Bengal	West	Jharkhand and neighbourhood	Less marked on 12
4.	Upto mid tropospheric levels	6 – 12	South Andaman Sea and neighbourhood	Quasi–stationary	Andaman Sea and neighbourhood	Less marked on 13
5.	Do	8	Lakshadweep	Stationary	*In situ*	Less marked on 9

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
6.	Upto mid tropospheric levels	16 – 25	Northwest Bay off north Andhra–south Orissa coasts	East	West–central Bay	Less marked on 26
7.	Do	21 – 23	Bihar and neighbourhood	Stationary	*In situ*	Less marked on 24
8.	Do	23	Orissa and adjoining Jharkhand	Do	Do	Less marked on 24
9.	Do	17 – 19	North Andaman Sea and adjoining Gulf of Martaban	Do	Do	Less marked on 20
10.	Do	19 – 20	East–central Arabian Sea off Maharashtra–Karnataka	Do	Do	Less marked on 21
11.	Do	22 – 23	Southwest Bay off Tamil Nadu coast	Stationary	*In situ*	Less marked on 24
12.	Do	25 – 27	West–central and adjoining northwest Bay off Orissa–west Bengal coasts	Do	Do	Less marked on 28
13.	Do	28 – 30	Telangana and adjoining coastal Andhra Pradesh	Do	Do	Less marked on 31
14.	Do	29 – 30	East–central Arabian Sea off Karnataka coast	Northerly	Maharashtra coast	Moved away on 31
(**C**)	*East–West trough*					
1.	Lower levels	7 – 15	West Rajasthan to Gangetic West Bengal	Quasi–stationary	Northwest Rajasthan to Gangetic West Bengal	Less marked on 16
(**D**)	*Easterly troughs*					
1.	As a trough of low at sea level	9 – 10	Southeast Arabian Sea and adjoining Lakshadweep	Oscillatory	Southeast Arabian sea	Moved away westwards on 11
2.	Do	20 – 30	Punjab to Nagaland-Manipur-Mizoram-Tripura	Do	Uttar Pradesh to Bihar	Less marked on 31
3.	Do	31 May – 6 Jun	West Rajasthan to north Bay	Do	Uttar Pradesh, Bihar, Jharkhand, Gangetic West Bengal	Less marked on 7
(**E**)	*Trough / wind discontinuity*					
1.	Lower levels	17 – 18	Northwest Madhya Pradesh to south Tamil Nadu	Do	Do	Less marked on 19
(**F**)	*Off–shore troughs*					
1.	Sea level	27	Off Karnataka–Kerala coasts	Oscillatory	South Maharashtra–Karnataka coasts	Persisted in the next season

3.1.2. *Rainfall distribution*

Month's rainfall was: *excess* in 23 meteorological sub-divisions *viz.*, Andaman & Nicobar Islands, Orissa, east Uttar Pradesh, west Uttar Pradesh, Haryana, Punjab, east Rajasthan, west Rajasthan, east Madhya Pradesh, west Madhya Pradesh, Saurashtra & Kutch, Konkan & Goa, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Telangana, Rayalaseema, Tamil Nadu, coastal Karnataka, north interior Karnataka, south interior Karnataka, Kerala and Lakshadweep; *normal* in 2, *viz.*, Jharkhand and Uttaranchal; *deficient* in 5, *viz.*, Sub-Himalayan West Bengal & Sikkim, Bihar, Himachal Pradesh, Jammu & Kashmir and Marathwada and *scanty* in 6, *viz.*, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Gujarat region and Madhya Maharashtra. Principal amounts of rainfall are given in Table 5.

3.1.3. *Temperature distribution*

Heat wave conditions prevailed at isolated places on 1 day each in Orissa and Jharkhand. *Hot day conditions* also prevailed on 1 day each in coastal Andhra Pradesh and Tamil Nadu.

Day temperatures were *appreciably* to *markedly above normal* on: 10 to 15 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Orissa, east Uttar Pradesh, Uttaranchal, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Saurashtra & Kutch and coastal Andhra Pradesh; 4 to 9 days in Gangetic West Bengal, Jharkhand, Bihar, west Uttar Pradesh, Haryana, Konkan & Goa, Madhya Maharashtra, Tamil Nadu and coastal & north interior Karnataka and on 1 to 3 days in Arunachal Pradesh, Punjab, west Madhya Pradesh, Gujarat region, Marathwada, Vidarbha, Chattisgarh, Rayalaseema and Kerala and were *above normal* on: 25 days in Tamil Nadu; 8 to 12 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Orissa, Madhya Pradesh, Konkan & Goa, Madhya Maharashtra and Kerala; 4 to 7 days in Jharkhand, Bihar, Uttar Pradesh, Uttaranchal, Punjab, Rajasthan, Madhya Pradesh, Gujarat region, Konkan & Goa, Madhya Maharashtra, Chattisgarh, Andhra Pradesh and coastal Karnataka and on 1 to 3 days in Arunachal Pradesh, Gangetic West Bengal, Haryana, Jammu & Kashmir, east Rajasthan, Gujarat region, Marathwada, Vidarbha and interior Karnataka. They were *appreciably* to *markedly below normal* on: 10 to 14 days in Haryana, west Madhya Pradesh, Marathwada, Vidarbha and Chattisgarh ; 4 to 9 days in Arunachal Pradesh, Assam & Meghalaya, Orissa, Jharkhand, Bihar, Uttar Pradesh, Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Telangana and south interior Karnataka and on 1 to 3 days in Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Uttaranchal, Saurashtra & Kutch, Konkan & Goa, coastal Andhra Pradesh, Rayalaseema and Tamil Nadu and were *below normal* on: 4 to 7 days in Orissa, east Uttar Pradesh, Uttaranchal, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Gujarat State, Marathwada, Vidarbha, Andhra Pradesh, Tamil Nadu and south interior Karnataka and on 1 to 3 days in Arunachal Pradesh, Assam & Meghalaya, West Bengal & Sikkim, Jharkhand, Bihar, west Uttar Pradesh, Madhya Maharashtra, Chattisgarh and coastal & north interior Karnataka. During the month, the highest maximum temperature of 43.0° C was recorded at Bankura (Gangetic West Bengal) on 27 March.

Night temperatures were *appreciably* to *markedly below normal* on: 12 days in Madhya Maharashtra; 4 to 8 days in Orissa, Jharkhand, Bihar, east Uttar Pradesh, west Rajasthan, west Madhya Pradesh, Gujarat region, Marathwada, Telangana and south interior Karnataka and on 1 to 3 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Uttaranchal, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, Saurashtra & Kutch, Konkan & Goa, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Tamil Nadu and north interior Karnataka; *appreciably* to *markedly above normal* on: 22 days in west Rajasthan; 9 to 15 days in Gangetic West Bengal, Haryana, east Rajasthan, Madhya Pradesh, Gujarat State, Vidarbha, Chattisgarh, coastal Andhra Pradesh and Kerala; 4 to 8 days in Jharkhand, Bihar, Uttar Pradesh, Uttaranchal, Punjab, Madhya Maharashtra, Marathwada, Telangana, Rayalaseema, Tamil Nadu and Kerala; and were *above normal* on: 14 to 15 days in coastal Andhra Pradesh and Tamil Nadu; 8 to 12 days in West Bengal & Sikkim, Orissa, Jammu & Kashmir, west Rajasthan, Gujarat State, Konkan & Goa, Telangana, Rayalaseema and coastal Karnataka; 4 to 7 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, west Uttar Pradesh, Uttaranchal, Haryana, Punjab, east Rajasthan, Madhya Pradesh, Madhya Maharashtra, Marathwada and Kerala and on 1 to 3 days in Arunachal Pradesh, Jharkhand, Bihar, east Uttar Pradesh, Himachal Pradesh, Vidarbha, Chattisgarh and north interior Karnataka. The lowest minimum temperature for the month as well as for the season was 7.0° C recorded at Ludhiana (Punjab) on 2 March.

3.1.4. *Disastrous weather events and damage*

According to media as well as various disaster reports, thunderstorm, hailstorm and lightning claimed the lives of 35 people altogether in Assam & Meghalaya (1), Gujarat State (5), Karnataka (9), Kerala (4), Madhya

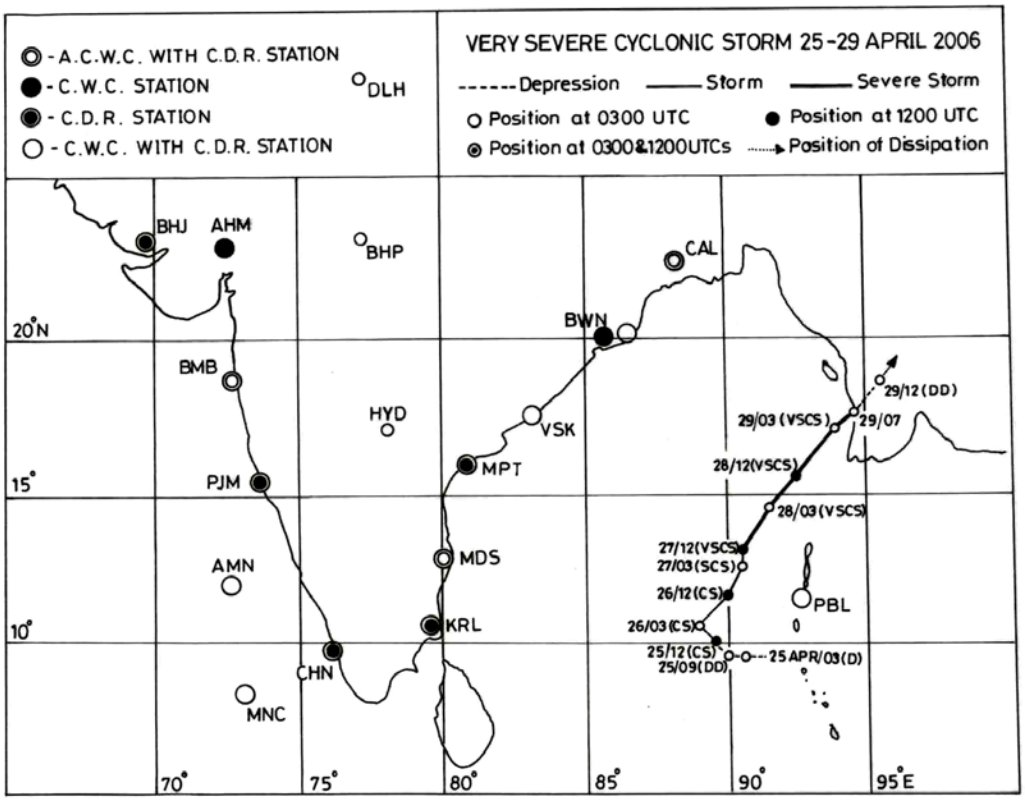

Fig. 2. Track of the system during 25-29 April 2006

Pradesh (3) and Madhya Maharashtra (13). Many acres of standing crops *viz*., wheat, grapes and oranges were also damaged over various parts of the country.

3.2. *April*

The following was one of the major synoptic systems during the month, though it did not affect the weather over the country.

3.2.1. *Very Severe Cyclonic Storm (Mala) over the southeast Bay and adjoining south Andaman Sea (25 – 29 April 2006)*

A trough of low organised into a low pressure area over the southeast Bay and adjoining south Andaman Sea during 22-24. It concentrated into a Depression and lay centred at 0300 UTC of 25, near Lat. 9.5° N / Long. 90.5° E (about 350 km southwest of Port Blair). It rapidly intensified into a Cyclonic Storm and lay centred at 1200 UTC of 25 near Lat. 10.0° N / Long. 89.5° E; at 0300 UTC of 26, near Lat. 10.5° N / Long. 89.0° E and at 1200 UTC of 26, near Lat. 11.5° N / Long. 90.0° E. Moving in a northnortheasterly direction, it intensified into a Severe Cyclonic Storm and lay centred at 0300 UTC of 27 near Lat. 12.5° N / Long. 90.5° E (about 250 km westnorthwest of Port Blair); further into a Very Severe Cyclonic Storm and lay centred at: 1200 UTC of 27, near Lat. 13.0° N / Long. 90.5° E; 0300 UTC of 28, near Lat. 14.5° N / Long. 91.5° E; 1200 UTC of 28, near Lat. 15.5° N / Long. 92.5° E and at 0300 UTC of 29, near Lat. 17.0° N / Long. 94.0° E. Moving northeastwards, it crossed Arakan coast about 100 km south of Sandoway at 0700 UTC of 29, rapidly weakened into a Deep Depression and lay centred at 1200 UTC of 29, near Lat. 18.5° N / Long. 95.5° E and subsequently became less marked on 30. Track of the system is shown in Fig. 2.

The lowest estimated central pressure was 954 hPa. The maximum estimated wind speed was 100 kts. The system was tracked by Satellite, ship and buoy. Maximum intensity of T-5.5 was reported by Kalpana - 1 imagery from 0900 UTC of 28 to 0300 UTC of 29. Eye pattern was seen from 1200 UTC of 27. Temperature of the Eye decreased continuously and in Infrared imagery, Eye was observed. Hence the intensity of the vortex was kept at T-5.5 from 0900 UTC of 28 to 0300 UTC of 29.

The wind shear (10-20 mps) between mid & upper levels initially inhibited the intensification of the system

irrespective of the SST values of the order of 28-29° C over the area. Later on when the rapid intensification into a Very Severe Cyclonic Storm occurred during 27 & 28, the wind shear had become quite negligible (*i.e*., of the order of 5-10 mps).

Widespread to fairly widespread rainfall activity occurred over Andaman & Nicobar Islands from 24 to 29 April with isolated heavy rainfall.

The chief amounts of rainfall in cms are :

25 April 2006 : Nancowry 7

27 April 2006 : Car Nicobar 10

28 April 2006 : Hut Bay 6

29 April 2006 : Port Blair 6

3.2.2. *Weather and associated synoptic features*

Heat wave conditions prevailed over various parts of the country almost all through the month except the third week in which good rainfall activity occurred over major parts of the country.

Details of the weather systems during the month are given in Table 3.

Very heavy rain occurred on: 1 to 3 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura and Kerala. *Heavy rain* occurred on 1 to 4 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Orissa, coastal Andhra Pradesh, Tamil Nadu and Kerala.

Rain/thundershowers occurred either *at most places* or *at many places* on: 11 to 14 days in Arunachal Pradesh and Assam & Meghalaya; 4 to 8 days in Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura and Sub-Himalayan West Bengal & Sikkim and on 1 to 3 days in Gangetic West Bengal, Orissa, Jharkhand, Bihar, Himachal Pradesh, Jammu & Kashmir, Vidarbha, coastal Andhra Pradesh, Telangana, north interior Karnataka and Kerala. It occurred either at *a few places* or at *isolated places* on: 19 to 22 days in Andaman & Nicobar Islands, Orissa, Tamil Nadu, south interior Karnataka and Kerala; on 11 to 16 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Jammu & Kashmir and north interior Karnataka ; 4 to 10 days in Jharkhand, Bihar, east Uttar Pradesh, Haryana, Himachal Pradesh, Marathwada, Chattisgarh, Andhra Pradesh and coastal Karnataka and on 1 to 3 days in west Uttar Pradesh, Uttaranchal, Punjab, Rajasthan, Madhya Pradesh, Konkan & Goa, Madhya Maharashtra and Vidarbha.

3.2.3. *Rainfall distribution*

Rainfall was: *excess* in 7 meteorological sub-divisions *viz*., Andaman & Nicobar Islands, east Uttar Pradesh, east Madhya Pradesh, Vidarbha, Chattisgarh, coastal Andhra Pradesh and Telangana; *normal* in 6, *viz.*, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub–Himalayan West Bengal & Sikkim, Gangetic West Bengal, Orissa, west Madhya Pradesh and Tamil Nadu; *deficient* in 11, *viz*., Arunachal Pradesh, Jharkhand, Bihar, west Uttar Pradesh, Uttaranchal, Jammu & Kashmir, west Madhya Pradesh, Rayalaseema, north interior Karnataka, south interior Karnataka and Kerala and *scanty* in 10, *viz*., Haryana, Punjab, Himachal Pradesh, east Rajasthan, west Rajasthan, Konkan & Goa, Madhya Maharashtra, Marathwada, coastal Karnataka and Lakshadweep. There was no rain in Gujarat State. The principal amounts of rainfall are given in Table 5.

3.2.4. *Temperature distribution*

Severe heat wave conditions prevailed on 1 day in west Rajasthan. *Heat wave conditions* prevailed on 5 to 9 days in Haryana, Punjab, Rajasthan and coastal Andhra Pradesh and on 1 to 3 days in Jharkhand, Uttar Pradesh, Madhya Pradesh, Rayalaseema and Tamil Nadu. *Hot day conditions* also prevailed on 1 or 2 days in Jharkhand, Rajasthan and Madhya Pradesh.

Day temperatures were *appreciably to markedly above normal* on 9 to 16 days in Assam & Meghalaya, Jharkhand, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Madhya Maharashtra, Chattisgarh and Rayalaseema and on 4 to 7 days in Sub-Himalayan West Bengal & Sikkim, Orissa, west Uttar Pradesh, east Madhya Pradesh, Vidarbha, coastal Andhra Pradesh, Tamil Nadu and coastal Karnataka and on 1 to 3 days in Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Saurashtra & Kutch, Marathwada, Telangana and south interior Karnataka and were *above normal* on 12 to 18 days in Rajasthan, Madhya Pradesh, Madhya Maharashtra, Tamil Nadu, south interior Karnataka and Kerala; 4 to 11 days in Assam & Meghalaya, Orissa, Jharkhand, Bihar, Uttar Pradesh, Uttaranchal, Haryana, Punjab, Himachal Pradesh, Rajasthan, Gujarat State, Marathwada, Vidarbha, Chattisgarh, Andhra Pradesh, coastal & north interior Karnataka and on 1 to 3 days in West Bengal & Sikkim and Jammu & Kashmir. They were appreciably to markedly below normal on 14 to 15 days in Assam & Meghalaya, Sub-Himalayan West

Bengal & Sikkim; on 4 to 9 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Orissa, Jharkhand, Bihar, east Uttar Pradesh, Uttaranchal, Jammu & Kashmir, Chattisgarh and on 1 to 3 days in Gangetic West Bengal, west Uttar Pradesh, Haryana, Himachal Pradesh, Rajasthan, Madhya Pradesh, Gujarat State, Madhya Maharashtra, Marathwada, Vidarbha, coastal Andhra Pradesh, Telangana, Tamil Nadu and interior Karnataka and were below normal on 4 to 10 days in Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, Bihar, east Uttar Pradesh, Gujarat State, Madhya Maharashtra, Telangana and Tamil Nadu and on 1 to 3 days in Assam & Meghalaya, Jharkhand, west Uttar Pradesh, Uttaranchal, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, Rajasthan, west Madhya Pradesh, Marathwada, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Rayalaseema and interior Karnataka. Highest maximum temperature of 44.5° C was recorded at Ganganagar (west Rajasthan) on 26 April.

3.2.5. *Disastrous weather events and damage*

According to media and other disaster reports, heat wave, thunderstorm, squally winds and lightning claimed the lives of 5 people in Vidarbha, 15 in west Bengal, 3 in Bihar, 10 in Orissa, 3 in Tripura, 10 in Assam & Meghalaya, 6 in Tamil Nadu and 3 in Kerala. Squally wind associated with norwesters damaged many houses and crops in West Bengal.

3.3. *May*

3.3.1. *Weather and associated synoptic features*

No cyclonic storm or depression formed during the month. The monsoon advance over Andaman Sea was well in time. Good rainfall occurred over various parts of the country towards the later half. Details of the weather systems during the month are given in Table 4.

3.3.2. *Advance of southwest monsoon*

The southwest monsoon arrived over parts of southeast Bay, Nicobar Islands and south Andaman Sea on 17. Within a week, it further advanced into some more parts of south Bay, entire Andaman Sea and some more parts of central Bay. The onset took place over Kerala on 26 May and it rapidly advanced over parts of Maharashtra, Karnataka and Andhra Pradesh by 31 May.

3.3.3. *Weather realised*

Extremely heavy rain occurred at *isolated places* on 2 days in Assam & Meghalaya and on 1 day each in coastal Karnataka and Konkan & Goa.

Very heavy rain occurred on 4 to 5 days in Assam & Meghalaya, coastal & south interior Karnataka and Kerala and on 1 to 2 days in Andaman & Nicobar Islands, Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Tamil Nadu, north interior Karnataka and Lakshadweep. *Heavy rain* also occurred on 4 to 5 days in Sub-Himalayan West Bengal & Sikkim, Orissa, Tamil Nadu, north interior Karnataka and Kerala and on 1 to 3 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Uttar Pradesh, Uttaranchal, Konkan & Goa, Marathwada, Rayalaseema and south interior Karnataka.

The southwest monsoon was *vigorous* on 4 to 6 days in coastal Karnataka and Kerala and on 1 to 2 days in Konkan & Goa and south interior Karnataka and *active* on 1 day in Kerala. Rain or thundershowers occurred either *at many places* or *at most places* on: 14 to 17 days in Andaman & Nicobar Islands, Assam & Meghalaya and Sub-Himalayan West Bengal & Sikkim; 8 to 13 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura and Kerala; on 4 to 7 days in Gangetic West Bengal, Orissa, Uttaranchal, Himachal Pradesh, Konkan & Goa, Madhya Maharashtra, Rayalaseema, coastal & north interior Karnataka and Lakshadweep and on 1 to 3 days in Jharkhand, Haryana, Punjab, Jammu & Kashmir, Madhya Pradesh, Marathwada, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Telangana, Tamil Nadu and south interior Karnataka. It occurred either at *isolated places* or *at a few places* on: 24 to 28 days in Orissa, Tamil Nadu and south interior Karnataka; 12 to 19 days in Andaman & Nicobar Islands, Gangetic West Bengal, Jharkhand, Bihar, Uttar Pradesh, Uttaranchal, Haryana, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, Vidarbha, Chattisgarh, Andhra Pradesh and coastal & north interior Karnataka and on 4 to 11 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Punjab, west Rajasthan, Madhya Pradesh, Konkan & Goa, Madhya Maharashtra, Marathwada and Lakshadweep.

3.3.4. *Rainfall distribution*

Rainfall was *excess* in 22 Met. sub-divisions, *viz*., Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Orissa, Jharkhand, east Uttar Pradesh, west Uttar Pradesh, Uttaranchal, Haryana, Punjab, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Konkan & Goa, Vidarbha, Chattisgarh, Telangana, Rayalaseema, coastal Karnataka, north interior Karnataka, south interior Karnataka, Kerala and Lakshadweep; *normal* in 5, *viz*., Andaman & Nicobar Islands, Sub-Himalayan West Bengal & Sikkim, west Rajasthan, coastal Andhra Pradesh

TABLE 5

Principal amounts of rainfall (1 cm and above) (March, April and May 2006)

Date	March	April	May
(1)	(2)	(3)	(4)
1.	Shenkottah 15, Mudukulathur & Munnar 3 each, Kodaikanal, Kuzhithurai, Punalur & Konni 1 each	Idukki 4, Kupwara & Kuzhithurai 3 each, Thoovalai, Thodupuzha, Kozha, Thuckalay, Nanguneri & Kolkata 1 each	Naraj 5, Bhalukpong & Kendrapada 4 each, Maya Bandar 1
2.	Shenkottah 4, Aryankuvu 3, Konni 2, Patna, Begamgani, Budhani, Seppa & Punalur 1 each	Dhubri 3, Nedumangad & Thuckalay 2 each, Hasimara, Car Nicobar, Anantnag, Daporijo & Kalpa 1 each	NH 31 11, Matizuri 10, Cooch Behar 8, Champasari, Domohani & Guwahati 7 each, Mazbat & Mathabhanga 5 each, Kailashahar & Jalpaiguri 3 each, Cherrapunji 2, Jaipur 1
3.	Nagpur 3, Sankalan, Saoner & Meenambakkam 2 each, Jabalpur, Nagapattinam, Narsingpur, Deori, Udgir, Munnar & Valparai 1 each	Cherrapunji 14, Tadong 4, Gangtok 3, Guwahati 2, Pahalgam, Alapuzha, Darjeeling, Neora & Doda 1 each	Chepan 7, Alipurduar & Hasimara 6 each, Cooch Behar, Matizuri, Chitradurga & Jalpaiguri 5 each, Barobhisa, Tezpur & Gopalpur 4 each, Mysore & Guwahati 3 each, Madurai, Bangalore & Silchar 2 each, Kailashahar 1
4.	Madurai 13, Kodaikanal 12, Mettupatti 11, Kunigal & Ottappalam 10 each, Coimbatore & Coonoor 8 each, Pondicherry 7, Pamban 6, Srivaikuntam & Raichur 5 each, Bhopal 4, Karipur 3, Belgaum & Parbhani 2 each	Agartala 7, Dhubri 5, Hut Bay 4, Rampurhat & Cherrapunji 3 each, Balasore, Sankalan & Cooch Behar 2 each, Tadong 1	Vallam 9, Bimalkhed & Khosa 7 each, Rajgarh & Khowang 6 each, Tadong & north Lakhimpur 4 each, Ramagundam, Itanagar, Kozha & Thanjavur 3 each, Pendra 2, Tezpur, Karaikal, Port Blair, Kolhapur & Passighat 1 each
5.	Shenkottah 7, Lalgudi 4, Pendra, Chickmagalur, Basirhat, Balasore & Diamond Harbour 3 each, Madurai & Jharsuguda 2 each, Akola & Chamba 1 each	Sonamura 16, Cherrapunji 9, Nancowry 6, Guwahati, Kailashahar, Itanagar & Passighat 3 each, Chepan & Dibrugarh 2 each, Agartala 1	Chepan 9, Barobhisa & Alipurduar 7 each, Gangtok & Tadong 6 each, Ziro, Khowang, Bhalukpong, Vadakkancherry, Konni, Kozhikode & Cherrapunji 5 each, Adirampattinam, Minicoy & north Lakhimpur 3 each, Kottayam & Passighat 2 each, Nagapattinam, Mangalore, Gadag & Pendra 1 each
6.	Pandavapura & Srirangapatnam 9 each, Alur 8, Banglore 5, Mysore 4, Punalur & Varkala 3 each, Pendra & Anatpur 2 each, Alapuzha, Hosur & Dibrugarh 1 each	Bihubar 6, Sankalan & Agartala 5 each, Golaghat & Gangtok 4 each, Tadong, Khanitar, Mazbat & Tezpur 3 each, Cherrapunji 2	Golaghat 9, Chouldhowaghat 8, Lakhimpur, Cherrapunji & Guwahati 5 each, Dibrugarh 4, Bankura & Passighat 3 each, Jagdalpur, Belgaum, Medikeri & Jalpaiguri 2 each, Imphal 1
7.	Valparai 5, Thuckalay & Saoner 3 each, Kannara, Balghat & Nizambad 2 each, Pendra, Badarwah & Sunni Bhajji 1 each	Konni, Tezpur & Cherrapunji 3 each, Khanitar & Chepan 2 each, Murti, Champasarai, Hasimara & Gangtok 1 each	Bageswar 6, Kailashahar 4, Agartala & Dhubri 3 each, Kharagpur & Karaikal 2 each, Berhampore 1
8.	Thodupuzha 6, Sundergarh, Thuckalay & Medikeri 3 each, Kozha, Konni, Gunupur & Hyderabad 2 each, Balimundali & Hoshangabad 1 each	Karimganj & north Lakhimpur 2 each, Kalaikunda, Silchar & Cooch Behar 1 each	Jaipur 7, Baripada 6, Durgachak, Haldia & Diamond Harbour 5 each, Contai & Paradip 4 each, Puri & Canning Town 3 each, Karipur 2, Sunni Bhaji, Medak & Gangtok 1 each
9.	Kannara & Bharatpur 3 each, Narsingpur, Sriniketan & Shantiniketan 2 each, Khajuraho, Minicoy, Palayamkottai & Gwalior 1 each	Dharmanagar 6, north Lakhimpur 5, Silchar 4, Gulmarg, Asansol & Kailashahar 3 each, Kupwara 2, Gangtok 1	Hadagalli 7, Paravur 6, Aski & Kangra 5 each, Dharamsala & Guleri 4 each, Banihal, Hyderabad, Anantpur, Jullandhar & Hut Bay 3 each, Cherrapunji 2, Gopalpur, Punalur & Dehra Dun 1 each
10.	Akola 9, Betul 8, Chindwara & Kanjirapally 7 each, Neyyattinkara & Coonoor 6 each, Narsingpur, Thuckalay & Gudalur 5 each, Kurnool & Bhopal 5 each, Panjim, Ketti & Barmer 4 each, Anantpur, Kodaikanal, Durg & Aurangabad 3 each, Bareilly 1	Kupwara 9, Quazigund & Dundee 8 each, Banihal 7, Dharmanagar, Pahalgam & Shimla 6 each, Solangnala, Lakhimpur & Cherrapunji 5 each, Silchar, Batote, Bhang & Patsio 4 each, Badarwah, Kasol, Pandoh & Gulmarg 3 each, Katra 2	Gajoldoba 10, NH 31, Balimundali 7, Dhenkanal, Kollam, Varkala & Hut Bay 6 each, Bhubaneswar, Cuttack, Hassan & Kolkata 4 each, Bahraich & Gangtok 3 each, Digha 2, Agartala 1

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
11.	Ongole 13, Dehra Dun 9, Dharampuri 8, Ramanathapuram 7, Bahadurgarh 6, Ambala, Minicoy & Sarsawa 5 each, Chandigarh, Hindon & Sambalpur 4 each, Akola, Ramagundam, Mulanur, Vellore & Ranchi 3 each, Tondi & Ambikapur 2 each	Cherrapunji 20, Miao 8, Putumari 7, Nalbari 5, Guwahati 4, Tezu & Dhubri 3 each, Dibrugarh, Namsai & Shantiniketan 2 each, Una, Banihal & Passighat 1 each	Dharmanagar 10, Tezpur 7, Chepan 5, Bageswar & Jalpaiguri 4 each, Keonjhargarh, Gadag, Yarcaud, Kanjirapally, Anandpur & Hut Bay 3 each, Mukteshwar, Udaipur, Patna, Bangalore & Kailashahar 2 each, Varanasi & Digha 1 each
12.	Sattur 7, Jowai 6, Kamuthi, Ramanathapuram & Chandigarh 5 each, Tiruvaiyaru & Gorakhpur 4 each, Karipur, Neematighat, Minicoy & Pamban 3 each, Dehra Dun, Jagdalpur, Itanagar & Cherrapunji 2 each	Cherrapunji 21, Konni & Passighat 6 each, Chouldhowaghat & North Lakhimpur 5 each, Tezu, Dibrugarh & Silchar 4 each, Punalur & Nancowry 2 each, Valparai 1	A. D. Nagar 20, Agartala 16, Gangtok & Kailashahar 9 each, Khonsa 5, Mysore 4, Tadong & Maya Bandar 3 each, Sundernagar 2, Bangalore & Tezpur 1 each
13.	Toludur & Sholavandan 3 each, Miao, Adirampattinam & Passighat 2 each, Jorhat, Durgachak, Dibrugarh & Digha 1 each	Kanjirappally & Cherrapunji 4 each, Sonepur & Hyderabad 3 each, Dhollabazar 2, Kottayam, Naduvattam & Dibrugarh 1 each	Belonia & Dharmapuri 9 each, Hasimara 8, Digha, Tadong & Hut Bay 7 each, Dibrugarh 5, Mohana 4, Gangtok, Gopalpur, Bangalore & Port Blair 3 each, Passighat 2, Gaya & Vellore 1 each
14.	Watrap 7, Bhavani 6, Gadra Road, Tiruppuvanam & Madurai 5 each, Omalur, Dharmapuri & Shimla 4 each, Sattur & Kasol, Rania 3 each, Barmer, Dehra Dun, Tuticorin & Pilani 1 each	Kanjirappally 7, Alathur 6, Mahendragarh 5, Hindol 4, Cochi & Valparai 3 each, Passighat 2, Kolkata, Pamban & Car Nicobar 1 each	Cherrapunji 10, Dhubri 8, Jamshedpur 7, Rajgangapur 6, Kalingapatnam 5, Harinkhola & Visakhapatnam 4 each, Agartala, Gopalpur & Passighat 3 each, Kolkata, Chandbali, Vellore & Shillong 2 each, Gangtok & Gopalpur 1 each
15.	Shenkottah 6, Banihal, Batote & Bhadarwah 5 each, Nagarcoil, Katra, Nagpur & Amritsar 4 each, Srivilliputtur, Quazigund, Jammu & Sundernagar 3 each, Jhansi, Pilani, Ayikudi & Tehri 2 each, Srinagar, Bangalore, Bhuntar, Shimla, Aya Nagar & New Delhi 1 each	Thodupuzha 11, Kanjirappally 7, Kodaikanal 6, Kozha 5, Namsai & Coonoor 4 each, Alapuzha 3, Uthamapalayam, Dibrugarh, Bankura, Jharsuguda, Champa & Medikeri 2 each, Thuckalay & Passighat 1 each	Kodaikanal 7, Kailashahar & Lucknow 4 each, Thodupuzha, Dholai & Valparai 3 each, Salem, Minicoy, Delhi & Silchar 2 each, Pangi & Shillong 1 each
16.	Mahedragarh, Gunupur & Dhundhi 5 each, Sankalan, Ayikudi & Hamirpur 4 each, Batote 3, Banihal, Shimla, Sundernagar & Nangal 2 each, Datia, Vijayawada, Sunni Bhajji & Mukteshwar 1 each	Sholavandan 9, Bhavani & Jagdalpur 7 each, Natham & Hassan 6 each, Mettupalayam & Mysore 5 each, Kovilpatti, Alapuzha & Balasore 3 each, Champa, Medikeri & Maya Bandar 2 each, north Lakhimpur, Tirupathi, Salem, Satna & Passighat 1 each	Champua 11, Cuttack 8, Keonjhargarh 6, Bhubaneswar 5, Bikapur & Jagdalpur 4 each, Balasore, Hut Bay, Ranchi & Nancowry 3 each, Pilani & Haldia 1 each
17.	Watrap 8, Nanguneri 7, Kashinagar & Poondi 4 each, Sattur & Gopalpur 3 each, Guna, Tirupattur, Nimpara & Visakhaptnam 2 each, Tuticorin, Khammam, Paradip & Guwahati 1 each	Repalle 12, Tenali & Podili 11 each, Ongole 10, Koraput 8, Nalgonda 7, Mehbubnagar 6, Tirumangalam, Karimganj & Bhadrachalam 5 each, Khammam, Gobichettipalayam, Hyderabad & Jagdalpur 4 each, Musiri, Tuni & Gadag 3 each, Valparai, Anantpur, Durg, Adirampattinam, Passighat, north Lakhimpur & Kalpa 2 each, Cannur & Badarwah 1 each	Thuraiyur 9, Berthin & Rasipuram 7 each, Dharamsala & Nancowry 6 each, Kasargode, Mandya, Kozhikode & Salem 4 each, Tiruchirapalli, Bharatpur & Tehri 3 each, Kodaikanal, Shimla, Tirupathi & Katra 2 each
18.	Sriperumbudur 7, Thoovalai 6, Pudukottai 5, Nagercoil 4, Musiri & Nancowry 3 each, Sulur 2, Sanakalan, Jorhat, Golaghat, Car Nicobar & Tuni 1 each	Varkala 13, Vedaranniyam 11, Mannargudi & Karambakudi 8 each, Needamangalam 7, Kollam, Darjeeling, Chepan & Kumbakonam 6 each, Tindivanam, Adirampattinam, Gangtok & Dibrugarh 5 each, Passighat 4, North Lakhimpur, Tiruchirapalli & Gopalpur 3 each, Bhuntar, Bhopal, Kalingapatnam, Solangnala & Allahabad 2 each, Lucknow, Sagar, Visakhapatnam, Satna & Dehra Dun 1 each	Nancowry 9, Port Blair 7, Ajmer 6, Hut Bay 5, Narsapur 4, Titlagarh & Indore 3 each, Kakinada 3, Bangalore & Amini Divi 2 each, Akola & Bikaner 1 each

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
19.	Nagercoil, Kundha Bridge, Khanitar & Nanguneri 1 each	Shenkottah 9, Dundigal 7, Neora, Tiruppuvanam & Malda 6 each, Midnapore & Madurai 5 each, Srivaikuntam & Tadong 4 each, Kotraguda, Dhubri, Ambur & Guwahati 3 each, Punalur, Kozhikode, Jamshedpur, Patna & Shantiniketan 2 each, Sambalpur, Allahabad, Mukteswar, Dundee, Ambikapur, Madurai, Kailashahar, Nancowry & Passighat 1 each	Piravom 16, CIAL Cochi & Nedumbassery 12 each, Chalakudy 11, Cochi 10, Minicoy, Dharmapuri & Alapuzha 8 each, Nanjangad, Kannur & Kottayam 7 each, Salem & Mysore 6 each, Tiruchirapalli & Nancowry 5 each, Karaikal, Rampur Bhushar, Karipur & Hut Bay 4 each, Nagapattinam, Nizamabad, Medikeri & Tehri 3 each, Berthin, Katra & Pendra 2 each
20.	Kupwara, Gulmarg, Pahalgam, Badarwah, Banihal & Batote 2 each, Quazigund 1	Namakkal 6, Kayamkulam, Mancompu & Chittur 5 each, Valparai 4, north Lakhimpur, Rajghat & Tezpur 3 each, Rasipuram, Car Nicobar, Balasore, Kottayam & Chengam 2 each, Agartala, Passighat & Tenkasi 1 each	Purushottampur & Car Nicobar 6 each, Panposh, Margherita & Jamshedpur 5 each, Jalpaiguri 4, Muzaffarpur, Bhopal, Kakinada, Kothagudam & Una 3 each, Ranchi, Minicoy, Keonjhargarh & Hut Bay 2 each, Gorakhpur, Quazigund & Guwahati 1 each
21.	Batote 3, Banihal 2, Badarwah, Car Nicobar, Mukteswar & Bhuntar 1 each	Mannargudi 6, Kanjirappally & Perundurai 5 each, Enmackel & Dindigal 4 each, Nancowry & Mayanur 3 each, Maya Bandar, Salem & Kovilpatti 2 each, Sattur 1	Car Nicobar 14, Kolkata & Port Blair 5 each, Vijayawada & Kolkata 4 each, Jharsuguda & Nancowry 3 each, Lansdowne, Satna & Chandrapur 2 each, Tawang 1
22.	Car Nicobar 3, Khanitar, Tadong, Itanagar, Ziro, Alapuzha & Khowang 1 each	Car Nicobar 7, Nancowry 5, Hut Bay 2, Hasanganj, Punalur, Kollengode, Nedumangad, Thiruvananthapuram, Thuckalay & Mudukulathur 1 each	Kotdwar 8, Dehra Dun 7, Maya Bandar 6, Bangana, Pandoh & Bahraich 5 each, Shimla, Sunni Bhaji, Punalur & Long Islands 4 each, Berthin, Port Blair & Car Nicobar 3 each, Jaipur, Pilani, Minicoy & Jhansi 2 each, Sambalpur, Banihal, Ambikapur & Shillong 1 each
23.	Cherrapunji & Car Nicobar 5 each, Konni, Sankalan & Hut Bay 2 each, Tezu, Miao & Gangtok 1 each	Kolkata 5, Damohani & Nagrakata 4 each, Nancowry & Kailashahar 3 each, Champasari, Basirhat, Nedumangad & Jalpaiguri 2 each, Seppa 1	Cochi, Naraingarh & Port Blair 7 each, Maya Bandar 6, Kalka 5, Nangal 4, Anandpur 3, Chandigarh, Una, Nedumbassery, Churu, Bhopal & Malda 2 each, Keonjhargarh, Shimla, Sirsa, Tuni & Sultanpur 1 each
24.	Konni 7, Karipur 6, Nancowry 3, Gangtok 2, Car Nicobar & Kozhikode 1 each	Chandbali, Tezu & Chouldhowaghat 3 each, Nagrakata, Kalpa, Seppa, Port Blair, Car Nicobar, Passighat & Dibrugarh 1 each	Mannarkad 13, Alipingal & Varkala 7 each, Kozhikode 6, Damohani & Hut Bay 5 each, Kodaikanal, Phulbani, Thiruvananthapuram & Jalpaiguri 4 each, Amini Divi, Minicoy, Alapuzha & Port Blair 3 each, Bhopal, Mehbubnagar, Punalur & Imphal 2 each, Paradip, Hyderabad, Kurnool, Gadag & Jhalawar 1 each
25.	Nancowry 10, Banihal, Badarwah & Quazigund 3 each, Ponnani, Batote & Car Nicobar 2 each, Rania, Sundernagar & Gangtok 1 each	Nancowry 7, Harinkhola & Bagati 5 each, Tadong & Hut Bay 3 each, Gangtok, Kolkata & Port Blair 2 each, Seppa, Tawang, Anandpur, Cherrapunji & Kailashahar 1 each	Baghdogra & Khanapur 13 each, Bolangir 8, Tadong, Parbhani & Gangtok 5 each, Kurnool 4, Nagpur, Cuddapah & Bhopal 3 each, Kalingapatnam, Cuttack, Mehbubnagar, Ranchi, Cochi, Alapuzha, Kottayam & Agartala 2 each, Maya Bandar, Jhansi, Raichur, Kanyakumari, Karipur & Cherrapunji 1 each
26.	Thodupuzha & Padampur 3 each, Sriganganagar, Badarwah, Ganganagar & Banihal 2 each, Rania, Karipur, Bhuntar & Miao 1 each	Kothagiri 6, Coonoor & Ketti 4 each, Jorhat & Mettupalayam 3 each, Nancowry, Anandpur, Mahendragarh, Hut Bay & Bankura 1 each	Hungund 13, Anantpur 8, Tiruvallur 7, Mangalore 6, Munnar, Panjim, Ratnagiri & Kailashahar 5 each, Sabroom & Karipur 4 each, Sangli, Hut Bay, Nancowry, Guwahati, Patiala, Salem, Tawang & Cherrapunji 3 each, Vellore & Bahraich 2 each, Bhopal 1

TABLE 5 (*Contd.*)

(1)	(2)	(3)	(4)
27.	Kozha, Dhollabazar & Dibrugarh 3 each, Sankalan 2, Khowang, Banihal & Batote 1 each	Car Nicobar 10, Tangla 4, North Lakhimpur 3, Cherrapunji, Silchar, Malda, Jamshedpur, Jagdalpur & Hut Bay 2 each, Kailashahar, Chandbali & Port Blair 1 each	Kasargod 17, Cherrapunji 16, Sonamura 15, Panambur & Mangalore 13 each, Hosdurg 12, Agartala 11, Nedumbassery, Bhalukpong & Aurangabad 9 each, Kozhikode, Cannur & north Lakhimpur 8 each, Amini Divi, Alapuzha, Sulur & Bajpe 7 each, Cochi, Kottayam, Passighat & Karipur 6 each, Jalpaiguri, Kothagudam & Dibrugarh 5 each, Minicoy, Lengpui, Karwar, Kurnool & Imphal 4 each, Nalgonda, Thiruvananthapuram & Ranchi 3 each, Gorakhpur & Car Nicobar 2 each, Sangli, Bareilly & Panjim 1 each
28.	Fazilka 7, Dundee 3, Pandoh 2, Bhang, Sundernagar, Katra & Kupwara 1 each	Hut Bay 6, Changlong, Dhenkanal & Maya Bandar 4 each, Balurghat, Cuttack & Keonjhargarh 3 each, Kalingapatnam 2, Long Island & Dhollabazar 1 each	Cherrapunji 61, Bantwal 24, Mangalore 22, Bhagamandala 21, Kudulu 16, Karimganj 15, Sankalan & Cannur 14 each, Kozhikode & Panambur 13 each, Bajpe 12, Shirali 11, Passighat 10, Tezu 9, Aluva, Nedumbassery, Amini Divi & Honavar 8 each, Kailashahar 7, Cochi, Kottayam & Agartala 6 each, Pantnagar, Alapuzha, Varkala & Lakhimpur 5 each, Minicoy, Agathi & Daltonganj 4 each, Dehra Dun & Shillong 3 each, Muzaffarpur, Sultanpur, Aurangabad & Car Nicobar 2 each
29.	Gunupur 4, Madhabarida, Tangi, Mohana, Sarada & Bhubaneshwar 1 each	Port Blair 6, Long Island 4, Maya Bandar 3, Lucknow, Salem & Viralimalai 1 each	Bhagamandala 26, Cherrapunji 19, Agumbe 18, Belthangadi 16, Nilambur & Mudibidre 15 each, Dharamasthala 14, Kannur, A.D. Nagar, Quilandy, Karipur & Mani 13 each, Bajpe & Puttur 12 each, Thalasserry, Nagina, Perinthalmanna & Kozhikode 11 each, Manjdari, Mannarkad, Subramanya & Annapurnaghat 10 each, Pattambi, Enamackel, Thrissur, Chalakudy, Sonamura & Medikeri 9 each, Vadakkancherry, Cochi & Mulki 8 each, Kottayam, Agathi, Mangalore, Shirali, Belonia & Agartala 7 each, Amini Divi, Kollur, Aluva, Matizuri & Karimganj 6 each, Miao, Kailashahar, Sabroom, Tezu, Lakhimpur & Alapuzha 5 each, Haveri, Naharkatia, Sujanpur, Passighat & Alathur 4 each, Shillong & Namsai 3 each, Minicoy 2
30.	Kayamkulam 3, Mahendragarh, Maya Bandar & Tondi 2 each, Baripada & Punalur 1 each	Long Island & Port Blair 1 each	Karwar 44, Ankola 36, Bhagamandala 31, Dabolim 23, Kadra 22, Cooch Behar, Bajpe & Passighat 19 each, Shillong 16, Hasimara 14, Port Blair 12, Medikeri 11, Panambur & Honavar 10 each, Amini Divi & Cannur 9 each, Panjim 8, Alapuzha & Ratnagiri 6 each, Agathi, Cochi & Bhira 5 each, Thiruvananthapuram & Dhubri 4 each
31.	Chittur & Kuzhithurai 8 each, Kanjirapally 5, Kozha & Periyakulam 4 each, Sattur & Kottayam 3 each, Punalur & Valparai 2 each, Pamban 1	-	Ratnagiri 64, Panjim 21, Bhatkal 20, Bhagamandala & Amini Divi 18 each, Agathi, Shirali & Kolhapur 17 each, Valpoi 14, Mumbai 13, Honavar & Silchar 11 each, Kottayam 10, Cochi & Karwar 9 each, Neora & Medikeri 8 each, Alapuzha & Gangtok 7 each, Karipur & Lengpui 6 each, Alibag & Passighat 5 each, Kozhikode, Kolkata & Dibrugarh 4 each, Minicoy & Aurangabad 2 each

and Tamil Nadu and *deficient* in 7, *viz*., Arunachal Pradesh, Assam & Meghalaya, Bihar, Himachal Pradesh, Jammu & Kashmir, Madhya Maharashtra and Marathwada. There was no rain in Gujarat State. The principal amounts of rainfall are given in Table 5.

3.3.5. *Temperature distribution*

Severe heat wave conditions prevailed on 4 to 6 days in Haryana, and west Rajasthan and on 1 day each in Punjab, Jammu & Kashmir and east Rajasthan. *Heat wave conditions* prevailed on 17 days in west Rajasthan; 7 to 11 days in west Uttar Pradesh, Haryana, Jammu & Kashmir, east Rajasthan, west Madhya Pradesh and Vidarbha; on 1 to 4 days in Gangetic West Bengal, Orissa, Jharkhand, Punjab, Himachal Pradesh, east Madhya Pradesh, Madhya Maharashtra, Chattisgarh, coastal Andhra Pradesh, Telangana and Tamil Nadu. *Hot day conditions* prevailed on 4 to 5 days in Haryana and east Madhya Pradesh and on 1 to 2 days in Orissa, Jharkhand, Punjab, Rajasthan, Marathwada and Vidarbha.

Day temperatures were *appreciably* to *markedly above normal* on 14 to 16 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura and Madhya Maharashtra; on 8 to 10 days in Punjab, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, west Madhya Pradesh, Tamil Nadu and coastal Karnataka; 4 to 7 days in Arunachal Pradesh, Sub-Himalayan West Bengal & Sikkim, Orissa, Uttaranchal, Haryana, west Rajasthan, Madhya Pradesh, Saurashtra & Kutch, Telangana, Rayalaseema and on 1 to 3 days in Gangetic West Bengal, Uttar Pradesh, Konkan & Goa, Marathwada, Vidarbha, Chattisgarh, coastal Andhra Pradesh, interior Karnataka and Kerala and were *above normal* on 8 to 13 days in Orissa, east Madhya Pradesh, Saurashtra & Kutch, Konkan & Goa, Marathwada, Tamil Nadu, coastal & south interior Karnataka; 4 to 7 days in Nagaland-Manipur-Mizoram-Tripura, Punjab, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, west Madhya Pradesh, Gujarat region, Madhya Maharashtra, Vidarbha, Chattisgarh, Telangana, Rayalaseema and on 1 to 3 days in Assam & Meghalaya, West Bengal & Sikkim, Jharkhand, Bihar, Uttar Pradesh, Uttaranchal, Haryana, east Rajasthan, coastal Andhra Pradesh and north interior Karnataka. They were appreciably to markedly below normal on 22 days in east Uttar Pradesh; 15 to 19 days in Orissa, Jharkhand, west Uttar Pradesh; 7 to 12 days in Uttaranchal, Haryana, Punjab, Chattisgarh and Telangana; 3 to 6 days in Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Jammu & Kashmir, Rajasthan, Madhya Pradesh, Marathwada, Vidarbha, coastal Andhra Pradesh, Rayalaseema and south interior Karnataka and on 1 to 2 days in Arunachal Pradesh, Madhya Maharashtra, north interior Karnataka and Kerala and were *below normal* on 15 days in Kerala; 8 to 10 days in Orissa, Jharkhand, Bihar, Chattisgarh, Telangana and on 4 to 7 days in Haryana, Rajasthan, Gujarat State, Madhya Maharashtra, Marathwada, coastal Andhra Pradesh, Rayalaseema and on 1 to 3 days in Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Uttar Pradesh, Uttaranchal, Punjab, west Rajasthan, east Madhya Pradesh, Konkan & Goa, Vidarbha and south interior Karnataka.

The month's as well as the season's highest maximum temperature of 48.0° C was recorded at Ganganagar (west Rajasthan) on 6, 7, 8, 13 & 15 May.

3.3.6. *Disastrous weather events and damage*

According to media and other disaster reports, heat wave, thunderstorm , hailstorm and heavy rains claimed 172 lives altogether in various parts of the country like Orissa (54), Uttar Pradesh (29), Kerala (16), Karnataka (13), Vidarbha (11), West Bengal & Sikkim (8), Assam & Meghalaya (6), Bihar (9), Jharkhand (13), Madhya Pradesh (1), Tripura (1), Tamil Nadu (4), Haryana (3) and Rajasthan (4). The heavy rains associated with the early advance of monsoon also created havoc.

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	-	75 % or more stations of a meteorological sub-division reporting atleast 2.5 mm rainfall.
At many places	-	51% to 74 % 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 12.5 cm or more.

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 35° 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.

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

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.