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Weather in India

WINTER SEASON (January-February 2007)†

1. Introduction

Like last year, the severity of winter was short lived during the winter season, January-February 2007. *Severe cold wave conditions*[1] prevailed over northwest India only in the first fortnight of January. Rest of the winter was mild with *cold wave conditions* occurring at isolated pockets of northwest, central and peninsular India. This year, once again, parts of Dal Lake in Srinagar were frozen during the second week of January. Also fog continued to occur over the northern parts of the country in the beginning of January, disrupting road, rail and air transports.

No intense low pressure system formed over the north Indian Ocean during the period. Also the easterly-westerly interactions, which often cause the rainfall activity to extend even upto south peninsula, had been practically nil, during the season.

The rainfall activity was very much subdued during the month of January. However, during February, many parts, especially the north India received good rainfall due to an active western disturbance.

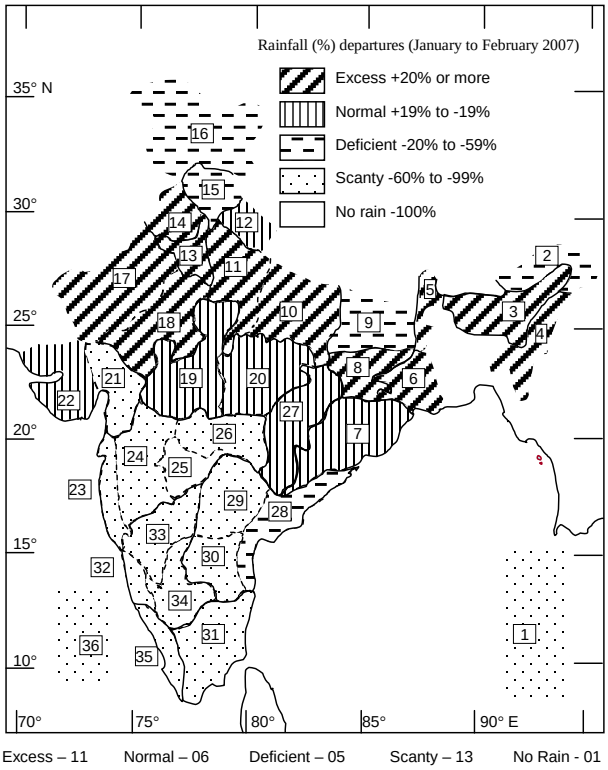

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for winter season (January - February 2007). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1	–93	**7**	10	**13**	151	**19**	–15	**25**	–100	**31**	–69
2	–31	**8**	93	**14**	41	**20**	–11	**26**	–94	**32**	–94
3	72	**9**	–42	**15**	–38	**21**	–91	**27**	–12	**33**	–99
4	48	**10**	53	**16**	–44	**22**	–15	**28**	–40	**34**	–93
5	87	**11**	76	**17**	241	**23**	–96	**29**	–74	**35**	–78
6	86	**12**	18	**18**	34	**24**	–99	**30**	–79	**36**	–61

2. Seasonal rainfall (January-February)

The seasonal rainfall was: *excess* in 11 met. sub–divisions, *viz*., Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Jharkhand, east Uttar Pradesh, west Uttar Pradesh, Haryana, Chandigarh & Delhi, Punjab, west Rajasthan and east Rajasthan; *normal* in 6 met. sub-divisions, *viz.*, Orissa, Uttarakhand, west Madhya Pradesh, east Madhya Pradesh, Saurashtra & Kutch and Chattisgarh; *deficient* in 5, *viz.*, Arunachal Pradesh, Bihar, Himachal Pradesh, Jammu & Kashmir and coastal Andhra Pradesh and *scanty* in 13, *viz.*, Andaman & Nicobar Islands, Gujarat region[2], Konkan & Goa, Madhya Maharashtra, Vidarbha, Telangana, Rayalaseema, Tamil Nadu[3], coastal Karnataka, north interior Karnataka, south interior Karnataka, Kerala and Lakshadweep. The remaining 1 met. sub-division, *viz*., Marathawada remained mainly dry.

Seasonal sub-divisionwise percentage rainfall departures are given in figure 1 and also in Table 1.

[1] Definitions of words in Italics other than sub titles are 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 (January-February 2007)

S. No.	Meteorological Sub-divisions	January			February			Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A. & N. Islands	5	56	–91	2	29	–95	6	85	–93
2.	Arunachal Pradesh	17	49	–65	78	89	–12	95	138	–31
3.	Assam & Meghalaya	1	18	–93	76	27	183	77	45	72
4.	Naga., Mani., Mizo. and Tri.	**	14	–97	60	27	126	61	41	48
5.	S. H. W. B. & Sikkim	1	19	–97	91	30	207	91	49	87
6.	Gangetic West Bengal	3	13	–76	57	19	201	60	32	86
7.	Orissa	1	12	–92	34	20	73	35	32	10
8.	Jharkhand	0	18	–100	74	20	267	74	39	93
9.	Bihar	0	17	–100	16	12	40	16	28	–42
10.	East Uttar Pradesh	**	19	–99	51	14	264	51	33	53
11.	West Uttar Pradesh	1	20	–97	63	16	291	64	36	76
12.	Uttaranchal	5	60	–92	131	56	136	136	116	18
13.	Haryana, Chandigarh & Delhi	2	20	–91	88	16	453	90	36	151
14.	Punjab	1	27	–97	71	24	200	72	51	41
15.	Himachal Pradesh	**	100	–99	120	92	30	120	192	–38
16.	Jammu & Kashmir	10	106	–90	122	128	–5	132	234	–44
17.	West Rajasthan	0	4	–100	28	4	551	28	8	241
18.	East Rajasthan	**	6	–96	15	5	202	15	11	34
19.	West Madhya Pradesh	**	11	–99	14	6	141	14	17	–15
20.	East Madhya Pradesh	**	26	–99	40	19	110	40	45	–11
21.	Gujarat region	**	1	–98	**	1	–81	**	2	–91
22.	Saurashtra & Kutch	**	1	–99	2	1	72	2	2	–15
23.	Konkan & Goa	**	1	–99	**	**	–80	**	1	–96
24.	Madhya Maharashtra	**	2	–99	0	1	–100	**	4	–99
25.	Marathwada	0	3	–100	0	3	–100	0	7	–100
26.	Vidarbha	0	11	–100	1	11	–88	1	22	–94
27.	Chattisgarh	0	13	–100	24	14	66	24	27	–12
28.	Coastal Andhra Pradesh	0	7	–100	9	9	6	9	15	–40
29.	Telangana	0	4	–100	3	6	–54	3	10	–74
30.	Rayalaseema	0	3	–100	1	3	–55	1	7	–79
31.	Tamil Nadu	5	21	–74	6	14	–60	11	35	–69
32.	Coastal Karnataka	**	2	–99	**	**	–72	**	2	–94
33.	North interior Karnataka	**	2	–99	**	3	–99	**	5	–99
34.	South interior Karnataka	**	2	–99	**	3	–90	**	5	–93
35.	Kerala	**	11	–96	6	17	–66	6	28	–78
36.	Lakshadweep	10	20	–52	5	17	–72	15	37	–61

Note : ** indicates rainfall amounts 0.1 to 0.4 mm (amounts less than 0.1 mm are rounded off to zero).

TABLE 2

Details of the weather systems during January 2007

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*)	*Upper air cyclonic circulations*					
1.	Upto mid tropospheric levels	3 – 8	Afghanistan and adjoining north Pakistan	Northeast	Northern parts of Jammu & Kashmir	Moved away northeastwards on 9
2.	Do	9 – 10	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and adjoining Pakistan	Moved away northeastwards on 11
3.	Do	15 – 16	Jammu & Kashmir and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away northeastwards on 17
4.	Do	17 – 19	Northeast Afghanistan and adjoining north Pakistan	Do	Jammu & Kashmir and neighbourhood	Moved away northeastwards on 20
5.	Do	24 – 28	Do	Do	Do	Moved away northeastwards on 29
6.	Do	28 – 30	Do	Do	North Pakistan and adjoining Jammu & Kashmir	Moved away northeastwards on 31.
7.	Do	31 Jan – 5 Feb	Do	Do	Northern parts of Jammu & Kashmir	Moved away northeastwards on 6 February
(*ii*)	*Induced upper air cyclonic circulations*					
1.	Upto lower tropospheric levels	18 – 19	Southwest Rajasthan and adjoining Pakistan	Quasi-stationary	West Rajasthan and neighbourhood	Less marked on 20
2.	Do	26 Jan – 1 Feb	South Rajasthan and neighbourhood	Northeast	Haryana, Chandigarh & and neighbourhood	less marked on 2 February
3.	Upto mid tropospheric levels	9 – 12	Punjab and neighbourhood	Stationary	*In situ*	less marked on 13
(**B**)	*Other cyclonic circulations*					
1.	Upto mid tropospheric levels	11 – 15	Assam & Meghalaya and neighbourhood	-	-	It was later seen as a trough in westerly (mid tropospheric levels) on 16 & 17 and became less marked on 18
2.	Do	21 – 31	Assam & Meghalaya and neighbourhood	Quasi-stationary	-	It was seen as a trough in the lower level westerlies from Assam & Meghalaya to north Bay during 1-4 February and became less marked there after
(**C**)	*Troughs in westerlies*					
1.	Mid & upper tropospheric westerlies	4 – 8	Long. 62° E, north of Lat. 25° N	East	Long. 85° E, north of Lat. 25° N	Less marked on 9
2.	Do	26 – 28	Northern parts of Jammu & Kashmir to south Pakistan	Northeast	Jammu & Kashmir to south Rajasthan	Moved away on 29
(**D**)	*Troughs in easterlies*					
1.	Sea level	8 – 12	Southeast and adjoining southwest Bay off Sri Lanka-Tamil Nadu coasts	West	Commorin and adjoining Sri Lanka	Less marked on 13
2.	Trough of low (sea level)	17 – 29	Southwest Bay off Sri Lanka coast	Northwest	Southwest Bay off Sri Lanka-Commorin area	Moved away westwards on 30

TABLE 3

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

Sub-division		Dates (Number of days)						
S. 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	Nil	Nil	Nil	Nil	Nil	6, 31 (2)	Nil
3.	Assam & Meghalaya	Nil	Nil	Nil	14-20 (7)	3, 16, 18, 19, 21-26 (10)	1, 2, 6-8, 11, 13 ,31 (8)	9, 10, 12, 22, 29, 30 (6)
4.	Naga., Mani, Mizo. and Tri.	Nil	Nil	Nil	16, 18 (2)	3, 4, 20, 21, 23 (5)	7, 8, 10, 31 (4)	1, 28, 29 (3)
5.	S. H. W. B. & Sikkim	Nil	Nil	Nil	2, 14, 16, 18, 19 (5)	3, 13, 18, 20, 21, 25 (6)	5-7, 9, 24, 26, 29-31 (9)	8, 10, 25, 28 (4)
6.	Gangetic West Bengal	Nil	Nil	Nil	18 (1)	18 (1)	29-31 (3)	Nil
7.	Orissa	Nil	6, 7, 9, 19, 20, 26 (6)	Nil	3, 5, 7-10, 18-20, 25 (10)	1, 4-6, 11, 12, 21, 26, 27 (9)	16, 17, 22, 23, 31 (5)	14, 16, 29, 30 (4)
8.	Jharkhand	Nil	5, 6, 18-20, 24, 26 (7)	Nil	1, 7-10, 15, 16, 21, 23, 25, 26 (11)	2, 4, 11, 12, 14, 15, 17, 18, 24 (9)	31 (1)	30 (1)
9.	Bihar	Nil	6, 10, 15-17 (5)	Nil	1, 4, 5, 7-10, 13, 14, 23-25 (12)	4, 11, 15, 17, 20, 21, 26 (7)	31 (1)	29 (1)
10.	East Uttar Pradesh	Nil	4-6, 8, 9, 13-18, 20, 23-26 (16)	Nil	4-6, 10, 12, 14, 17, 23, 24 (9)	1, 7, 8, 11, 13, 15, 16, 18, 22 (9)	28, 30, 31 (3)	29 (1)
11.	West Uttar Pradesh	Nil	8, 23, 24 (3)	3 (1)	13, 14, 17, 23, 24 (5)	1, 4, 5, 8, 9, 11, 15, 16, 22 (9)	28-31 (4)	2 (1)
12.	Uttarakhand	Nil	7 (1)	Nil	4, 6, 12-14, 17 (6)	1, 5, 18 (3)	19, 25-30 (7)	23 (1)
13.	Haryana, Chandigarh & Delhi	6, 7, 12 (3)	5, 7-9, 11, 13, 22, 23 (8)	2 (1)	3, 4, 9, 10, 15, 16, 21-23 (9)	11 – 14, 16, 17 (6)	18-20, 25, 27-31 (9)	25 (1)
14.	Punjab	7, 12, 17 (3)	3, 4, 5, 7-16, 21-24 (17)	2 (1)	2, 3, 17-20, 22-24 (9)	1, 4, 13, 21, 26 (5)	30 (1)	2,29 (2)
15.	Himachal Pradesh	6 (1)	Nil	Nil	Nil	Nil	25-29 (5)	Nil
16.	Jammu & Kashmir	Nil	5-8, 11, 13, 14, 16 (8)	Nil	3, 9, 22, 23 (4)	4, 10, 12, 13, 24 (5)	20, 26-31 (7)	18 (1)
17.	West Rajasthan	7,8 (2)	6, 11, 12, 14, 21, 23 (6)	Nil	9, 12, 17 (3)	2, 5, 8, 10, 13, 14, 16 (7)	1, 3, 5, 16, 18-21, 24, 25, 27-31 (15)	17, 23, 28 (3)
18.	East Rajasthan	8 (1)	4, 11-14, 22-24 (8)	Nil	3, 9, 16, 17 (4)	2, 5, 8, 10, 14, 16, 24 (7)	3, 5, 10, 16, 25, 27-31 (10)	17, 23 (2)
19.	West Madhya Pradesh	Nil	14 (1)	Nil	17, 19, 23-25 (5)	4, 8, 12, 16, 18, 19 (6)	5, 10, 26-30 (7)	9, 20, 21 (3)
20.	East Madhya Pradesh	Nil	14, 24 (2)	Nil	17, 22, 23 (3)	4, 5, 8, 12, 15, 16, 18, 24, 25 (9)	27-30 (4)	1, 9, 11, 20, 21 (5)
21.	Gujarat region	Nil	Nil	Nil	Nil	12-15, 23 (5)	1, 2, 5, 9-11, 16, 20, 21, 24-28, 30, 31 (16)	8, 13, 18, 22, 25 (5)
22.	Saurashtra & Kutch	Nil	6 (1)	Nil	7 (1)	12-14, 23 (4)	1-5, 10, 16, 20, 21, 23-26, 28-31 (17)	8, 13, 18, 25, 27 (5)
23.	Konkan & Goa	Nil	Nil	Nil	4,5 (2)	3, 14 (2)	23, 29-31 (4)	9, 10, 12, 21, 25, 27, 28 (7)
24.	Madhya Maharashtra	Nil	Nil	Nil	5, 6, 14, 17, 21 (5)	1-4, 7, 8, 11-14, 16, 17, 20 (13)	25, 26, 28-31 (6)	24, 27 (2)

TABLE 3 (*Contd.*)

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

3. Monthly features

3.1. *January*

3.1.1. *Weather and associated synoptic features*

There were 14 systems in the westerlies (including 7 western disturbances as upper air cyclonic circulations, 3 induced upper air cyclonic circulations and 2 troughs in mid and upper tropospheric westerlies affecting northwest India and 2 upper air cyclonic circulations over northeast India) and 2 troughs in the easterlies affecting the weather over the country. Details of these systems are given in Table 2.

Rain/snow occurred in Jammu & Kashmir *at many places* and *at a few places* on 1 day each and *at isolated places* on 3 days. It was also reported in Uttarakhand *at isolated places* on 1 day.

Rain/thundershowers occurred *at a few places* on 1 to 2 days in Arunachal Pradesh and Lakshadweep and *at isolated places* on: 9 days in Sub-Himalayan West Bengal & Sikkim; on 6 days in Andaman & Nicobar Islands and Arunachal Pradesh and on 1 to 3 days in Assam & Meghalaya, Gangetic West Bengal, Orissa, west Uttar Pradesh, Haryana, Chandigarh & Delhi, Punjab, Tamil Nadu, Kerala and Lakshadweep.

Heavy rain occurred on 1 day in Tamil Nadu.

3.1.2. *Monthly rainfall*

Monthly rainfall was *deficient* in 1 met. sub-division, *viz.*, Lakshadweep and *scanty* in 26, *viz.*, Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Orissa, east Uttar Pradesh, west Uttar Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh, Jammu & Kashmir, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Gujarat region, Saurashtra & Kutch, Konkan & Goa, Madhya Maharashtra, Tamil Nadu, coastal Karnataka, north interior Karnataka, south interior Karnataka and Kerala. The remaining 9 sub-divisions remained mainly dry during the month.

TABLE 4

Details of the weather systems during February 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*)	*Low pressure area*					
1.	Do	9 eve – 11	Central Pakistan and neighbourhood	East	Central Pakistan and adjoining west Rajasthan	It was seen as an upper air cyclonic circulation on 9 morning. Though it became less marked on 11, the associated cyclonic circulation extended upto mid tropospheric levels over southwest Rajasthan on 12. It became less marked on 15
(*ii*)	*Upper air cyclonic circulation*					
1.	Mid tropospheric levels	7	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir	Moved away northeastwards on 8
2.	Do	13	Jammu & Kashmir and neighbourhood	Do	Do	Moved away northeastwards on 14
3.	Do	14 eve – 19	Northeast Afghanistan and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away northeastwards on 20
4.	Do	20 – 22	North Pakistan and adjoining Afghanistan	Do	Jammu & Kashmir and neighbourhood	Moved away northeastwards on 23
5.	Do	23 – 25	Northeast Afghanistan and adjoining north Pakistan	Do	Northern parts of Jammu & Kashmir	Moved away northeastwards on 26
6.	Do	26 Feb – 1 Mar	Do	Do	Jammu & Kashmir and neighbourhood	Moved away on 2 March
(*iii*)	*Induced cyclonic circulations*					
1.	Lower tropospheric levels	6 – 7	Northwest Rajasthan	Northeast	Haryana, Chandigarh & Delhi and neighbourhood	Less marked on 8
2.	Do	9 – 10	West Rajasthan and adjoining central Pakistan	Do	Southwest Rajasthan	It merged with the cyclonic circulation associated with the western disturbance mentioned in (*i*) 1 above
3.	Mid tropospheric levels	15 – 17	Southwest Rajasthan and adjoining south Pakistan	Do	Haryana, Chandigarh & Delhi and neighbourhood	Less marked on 18
4.	Lower tropospheric levels	18 – 19	South Pakistan and adjoining southwest Rajasthan	Stationary	*In situ*	Less marked on 20
5.	Do	21	Do	Do	Do	Less marked on 22
6.	Mid tropospheric levels	23 – 25	Central Pakistan and adjoining Punjab	Do	Punjab and neighbourhood	Less marked on 26
7.	Do	23 – 25	Uttarakhand and neighbourhood	Stationary	*In situ*	Less marked on 25
8.	Lower tropospheric levels	26 Feb – 2 Mar	South Pakistan and adjoining west Rajasthan	Do	Uttarakhand and neighbourhood	Less marked on 3 March

TABLE 4 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**B**)	*Other cyclonic circulations*					
1.	Mid tropospheric levels	5 – 6	West Bengal & Sikkim and adjoining areas	East	Bangladesh and adjoining areas	Less marked on 7
2.	Do	7 – 8	Orissa and adjoining Gangetic West Bengal	Northeast	Assam & Meghalaya	Less marked on 9
3.	Lower troposphere	13 – 14	Southeast Madhya Pradesh and neighbourhood	Northeast	Orissa and adjoining Gangetic West Bengal and Jharkhand	Less marked on 15
4.	Lower tropospheric levels	24 eve – 25	East Rajasthan and adjoining west Madhya Pradesh	Do	Do	Less marked on 26
5.	Do	28 Feb – 1 Mar	East Uttar Pradesh and adjoining west Madhya Pradesh	Quasi-stationary	East Uttar Pradesh and neighbourhood	Less marked on 2 March
(**C**)	*Trough in the easterlies*					
1.	Lower levels	18 – 21	South Tamil Nadu to north Madhya Maharashtra through interior Karnataka	West	Lakshadweep to north Konkan	Less marked on 22
2.	Lower and mid tropospheric levels	21	Southwest Bay off south Sri Lanka – Tamil Nadu coast	Stationary	*In situ*	Less marked on 22
3.	Lower levels	24 – 25	Lakshadweep area to north Madhya Maharashtra	Do	Do	Less marked on 26
(**D**)	*Trough in the westerlies*					
1.	Mid & upper tropospheric westerlies	11 – 13	Long. 72° E, to the north of Lat. 30° N	East	Long. 75° E, to the north of Lat. 25° N	Less marked on 14
2.	Lower level westerlies	15 – 16	Assam & Meghalaya to north Bay	Quasi-stationary	Assam & Meghalaya and neighbourhood	Less marked 17
3.	Mid & upper tropospheric westerlies	24 – 27	Long. 67° E, to the north of Lat. 20° N	East	Long. 90° E, to the north of Lat. 25° N	Less marked on 28
(**E**)	*Tough/wind discontinuity*					
1.	At sea level	16 – 17	Chattisgarh to south Tamil Nadu through Telangana and Rayalaseema	Stationary	*In situ*	Less marked on 18

TABLE 5

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

S. No.	Sub-division 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
2.	Arunachal Pradesh	Nil	Nil	Nil	Nil	Nil	2 (1)	8, 24 (2)
3.	Assam & Meghalaya	Nil	16 (1)	Nil	16-19 (4)	20, 28 (2)	1-6, 8, 9, 12, 14 (10)	3, 10, 11, 15, 24-26 (7)
4.	Naga., Mani., Mizo. and Tri.	Nil	Nil	Nil	20 (1)	21 (1)	1, 2, 4-10, 12-15, 27 (14)	26 (1)
5.	S. H. W. B. & Sikkim	Nil	Nil	Nil	15, 19 (2)	16, 17 (2)	1-9, 11, 13, 24 (12)	10, 14, 22, 23, 25 (5)
6.	Gangetic West Bengal	Nil	Nil	Nil	Nil	15 (1)	1-7, 9-11, 25 (11)	1, 23, 28 (3)
7.	Orissa	Nil	22 (1)	14 (1)	13-16, 20, 21 (6)	16, 19, 20, 24, 25 (5)	1-11 (11)	2, 3, 28 (3)
8.	Jharkhand	Nil	22 (1)	14 (1)	15, 19-21 (4)	Nil	1, 2, 8-13 (8)	5-7, 28 (4)
9.	Bihar	Nil	Nil	Nil	Nil	15, 21, 22 (3)	2, 5-13, 23 (11)	1, 14, 25, 26, 28 (5)
10.	East Uttar Pradesh	Nil	Nil	Nil	17, 18 (2)	15, 16, 19, 21, 22, 26, 27 (7)	1-3, 6-13, 25, 28 (13)	6, 10, 23, 24, 27, 28 (6)
11.	West Uttar Pradesh	Nil	Nil	Nil	Nil	Nil	1-13, 25 (14)	10, 16 (2)
12.	Uttarakhand	Nil	16-19, 28 (5)	Nil	12, 16, 20 (3)	Nil	1-3, 5, 6, 10, 13, 25, 27 (9)	4, 8 (2)
13.	Haryana, Chandigarh & Delhi	Nil	Nil	14 (1)	Nil	20 (1)	1-11, 22, 27, 28 (14)	3, 15, 23, 24, 26 (5)
14.	Punjab	Nil	18 (1)	14 (1)	17, 18 (2)	20, 25 (2)	1, 4-7, 9, 10, 14, 28 (9)	6, 8, 22, 23, 27 (5)
15.	Himachal Pradesh	Nil	14, 15, 17 (3)	Nil	13, 15 (2)	Nil	1-6, 10, 27 (8)	22 (1)
16.	Jammu & Kashmir	Nil	Nil	Nil	15 (1)	16, 17 (2)	1-7, 9-11, 14, 21, 22, 25, 27 (15)	8, 17, 19, 26, 28 (5)
17.	West Rajasthan	Nil	Nil	14 (1)	Nil	Nil	1-11, 15-24, 26-28 (23)	12, 14, 17, 22, 25 (5)
18.	East Rajasthan	Nil	Nil	Nil	15 (1)	Nil	1-8, 10, 11, 15-20, 22-24, 26-28 (22)	12, 17, 22, 25 (4)
19.	West Madhya Pradesh	Nil	Nil	Nil	15 (1)	14, 17 (2)	1-11, 22-25, 27, 28 (17)	3, 7, 8, 16, 18-20, 24, 26 (9)
20.	East Madhya Pradesh	Nil	Nil	Nil	Nil	14 (1)	1, 3-11, 23-25, 27, 28 (15)	2, 3, 7, 8, 16, 17, 19, 20, 24, 26 (10)
21.	Gujarat Region	Nil	Nil	Nil	Nil	Nil	1, 3, 5, 7-12, 15-28 (23)	3, 4, 6, 8, 14, 15, 17, 18, 24 (9)
22.	Saurashtra & Kutch	Nil	Nil	Nil	Nil	Nil	1, 4-12, 14-28 (25)	2, 3, 8, 15, 17, 18, 24 (7)
23.	Konkan & Goa	Nil	Nil	Nil	14 (1)	4, 15, 16, 18 (4)	1, 11, 20-22 (5)	1, 3, 9, 10, 21-24 (8)
24.	Madhya Maharashtra	Nil	14 (1)	Nil	14-16, 27 (4)	5, 6, 12, 13, 17, 18, 25-27 (9)	1, 2, 10-12, 20-22 (8)	2, 3, 6, 9, 16, 19, 23, 25, 26, 28 (10)
25.	Marathawada	Nil	Nil	Nil	Nil	14, 18, 20 (3)	1-5, 8, 9, 11, 12, 20, 23 (11)	6, 16, 18, 19, 25, 28 (6)
26.	Vidarbha	Nil	Nil	Nil	20 (1)	17, 27 (2)	1-5, 8-12, 25 (11)	6, 10, 16, 18, 28 (5)

TABLE 5 (*Contd.*)

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

Sub-divisionwise percentage departure and principal amounts of rainfall for the month of January are given in Tables 1 and 6 respectively.

3.1.3. *Temperature*

Severe cold wave conditions prevailed on a few days in parts of Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh and Rajasthan. *Cold wave conditions* prevailed on many days over various parts of north India and a few days over the central and Peninsular region. *Cold day conditions* prevailed on 1 day each in west Uttar Pradesh, Haryana, Chandigarh & Delhi and Punjab.

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 3. Same date appearing in two different columns of sub-divisions may be reckoned as occurrence of that category over parts of the sub-divisions. Minimum temperatures were normal for the rest of the days.

The month's and the season's lowest minimum temperature over the plains was -2.2° C recorded at Udhampur (Punjab) on 8 January 2007.

3.1.4. *Disastrous weather events and damage*

Cold wave claimed the lives of 150 people in Uttar Pradesh and 7 in Bihar. Strong winds and rains damaged houses, rubber plantation and disrupted electricity in Kerala.

3.2. *February*

3.2.1. *Weather and associated synoptic features*

There were 18 eastward moving systems (including one low pressure area, 6 upper air cyclonic circulations extending upto mid tropospheric levels, 8 induced cyclonic circulations and 3 troughs in westerlies), 5 upper air cyclonic circulations, 3 troughs in the easterlies and a trough/wind discontinuity which affected the weather over the country during the month of February. Details of these systems are given in Table 4.

Rain/snow occurred: *at most places* on 3 to 4 days in Uttarakhand, Himachal Pradesh and Jammu & Kashmir; *at many places* on 4 days in Jammu & Kashmir and on 1 to 2 days in Uttarakhand and Himachal Pradesh; *at a few places* on 4 days in Jammu & Kashmir, 2 days in Uttarakhand and *at isolated places* on 7 days

TABLE 6

Principal amounts of rainfall in cm over different stations for the months of January and February 2007

Date (1)	January (2)	February (3)
1.	Nil	Imphal 5, Silchar & Dholai 4 each, Matizuri 3, Tadong & Kherunighat 2 each, Lakhimpur & Golaghat 1 each
2.	Nil	Imphal & Zero 1 each
3.	Nil	Dholla Bazar 4, Bhubaneshwar 2, Daporijo & Kohima 1 each
4.	Nil	Neora, Baderwah, Agartala & Kailashahar 2 each, Champasarai, Hasimara, Murti, Daporijo, Basar, Dholla Bazar, Banihal, Batote & Guwahati 1 each
5.	Nil	Matizuri, 6, Sabroom 5, Dharmanagar & Belonia 4 each, Garmura 3, Jorhat, Tadong, Sankalan, Kailashahar, Contai, Gangtok & Cherrapunji 2 each, Agartala, Tezpur, North Lakhimpur, Dibrugarh & Passighat 1 each
6.	Nil	Imphal 4, Chandbali, Matizuri & Cherrapunji 3 each, Guwahati, Daporijo, Lakhimpur & Dharmanagar 2 each, Alipurduar, Tezu & Itanagar 1 each
7.	Nancowry 1	Paradip 5, Narnaul & Jogindernagar 3 each, Bhuntar, Sankalan, Lakhimpur & Sundernagar 2 each, Agra, Passighat, Khanitar, Cooch Behar, Chepan, Rampur, Baijnath, Pahalgam & Gangtok 1 each
8.	Nil	Nilgiri, Krishnanagar & Bashirhat 5 each, Balasore, Tusuma & Cherrapunji 4 each, Guwahati, Govindpur, Bagati & Karimganj 3 each, Aizawal, Sabroom, Karnal, Cuttack, Imphal & Shillong 2 each, Paradip, Jamshedpur, Mukteswar, Ambala, Dhubri, Kolkata, Bankura, Digha, Tezpur, Daporijo & Basar 1 each
9.	Nil	Canning Town, Durgachak & Kharagpur 4 each, Bashirhat, Kalaikunda & Shantiniketan 3 each, Jamshedpur, Kolkata, Miao, Karimganj & Amraghat 2 each, Imphal, Digha, Sojat, Bhogarai, Jaleswar, Seppa & Udala 1 each
10.	Car Nicobar 1	Jabalpur, Raisen & Damoh 3 each, Kota, Udampur, Barmer, Batote, Naliya, Katra & Tondi 2 each, Karaikal, Bhopal, Gwalior, Sheopur, Guna, Sagar, Okha, Ramanathapuram, Banihal, Jammu, Jaisalmer, Churu, Jodhpur, Tiruvadanai & Rewa 1 each
11.	Nil	Bikaner 8, Ambala & Tehri 7 each, Chandigarh, Karnal, Hissar & Mukteswar 6 each, Dehra Dun & Bareilly 5 each, Jammu, Delhi, Shimla, Patiala, Batote & Pilani 4 each, Jaisalmer, Gwalior, Allahabad, Varanasi, Lucknow, Satna, Pendra, Daltonganj, Fursatganj, Gulmarg, Bansur & Khetri 3 each, Jaipur, Bhaderwah, Patna, Tondi, Bhind, Sundernagar, Ramanathapuram, Sultanpur, Amritsar, Ludhiana, Ganganagar, Churu, Bhind, Jabalpur, Banihal & Barmer 2 each, Ajmer, Mayiladuthurai, Tirukoilur, Bhuntar, Quazigund, Batote, Jodhpur, Guna, Sagar, Ambikapur & Champa 1 each
12.	Nil	Karnal 10, Nilokheri 8, Khandaghat 7, Shimla & Daltonganj 6 each, Sunnibhajji, Ambala, Chachrauli & Chandigarh 5 each, Amritsar, Kahu, Bahraich & Asansol 4 each, Kasol, Varanasi, Allahabad, Berhampur, Rampurghat, Gulmarg, Gaya, Mukteswar, Sundernagar, Katra & Shantiniketan 3 each, Jammu, Gurdaspur, Malerkotla, Ropar, Banihal, Delhi, Pantnagar, Patna, Ferozepur, Satna, Jabalpur, Ranchi, Sarsawa, Gangtok, Dhundhi, Sankalan & Singla Bazar 2 each, Baijnath, Bhang, Pandoh, Ludhiana, Purnea, Nowgaon, Malda, Bharatpur, Purnia, Nowgaon, Gorakhpur, Sultanpur & Tehri 1 each
13.	Basar 4, Chouldhowaghat 1	Ghatgaon 10, Bilaspur 6, Telkoi, Kobra & Padampur 5 each, Keonjhargarh, Thakurmunda, Hirakud, Sadulpur, Champa, Pendra & Balachaur 4 each, Seppa 3, K.B. Dam, Tezu, Dhola Bazar, Pantnagar, Dibrugarh, Delhi, Hissar, Karnal, Kalka, Nilokheri, Rohtak, Hoshiarpur, Ludhiana, Berthin, Dhundi, Jamshedpur, Sujanpur Tira, Sri Ganganagar, Satna, Daltonganj, Rohtak & Ranchi 2 each, Gohana, Siwani, Guler, Nadaun, Pandoh, Solangnala, Bharatpur, Bhind, Ambikapur, Nowgaon, Mukteswar, Bhang, Kahu, Kasol, Bhaderwah, Katra, Kupwara, Vijayawada, Nalgonda, Raipur, Pahalgam & Mudukulathur 1 each

TABLE 6 (*Contd.*)

(1)	(2)	(3)
14.	Passighat 1	Kakatpur 20, Narsingpur 10, Bhubaneshwar 7, Rajghat, Nimapara & Ghatgaon 6 each, Bhograi, Belonia, Keonjhargarh & Balasore 5 each, Khanitar, Singla Bazar, Durgachak, Rajgarh, Diamond Harbour & Gorakhpur 4 each, Dehra Dun, Tehri, Lucknow, Dholpur, Dharampur, Kolkata & Digha 3 each, Tuni, Champa, Hindan, Sarsawa, Canning Town, Cuttack, Nahan, Solan, Theog, Jamshedpur, Chandigarh, Malda, Imphal, Puri, Jharsuguda, Baharaich, Adampur, Paradip, Bahraich & Nawashahar 2 each, Shantiniketan, Chandbali, Halwara,Baijnath, Gangtok, Kailashahar, Bankura, Lengpui, Ambala, Tadong, Ranchi, Daltonganj, Agartala, Red Hills, Pantnagar, Delhi, Amritsar, Kandaghat, Palampur, Rohru, Rajgarh, Una, Dwarka, Narsapur, Kasauli, Khajuraho, Jagdalpur & Visakhapatnam 1 each
15.	Batote 1	Neora 7, Murti & Itanagar 6 each, Champasari 5, Bhalukpong, Sankalan, Gangtok & Cherrapunji 4 each, North Lakhimpur, Passighat & Goalpara 3 each, Imphal, Guwahati, Dhubri, Cooch Behar & Tezpur 2 each, Polur, Malda, Jalpaiguri, Jammu, Kailashahar, Silchar, Jorhat & Dibrugarh 1 each
16.	Miao 2	Beki, Road Bridge, Changlung, Baran & Dibrugarh 2 each, Jogindernagar, Dhollabazar & Passighat 1 each
17.	Dargachak Haldia 5, Contai 4, Jamsolaghat 2, Canning Town, Rajghat, Telkoi, Sundargarh, Balimundali 1 each	Cuttack & Sankalan 4 each, Mazbat, Alipingal & Vallam 3 each, Champasari 2, Bhalukpong, Changlong, Itanagar, Jorhat, Puri & Gangtok 1 each
18.	Nil	Mayiladuthurai 7, Cuddalore 5, Kundha Bridge & Bapatla 4 each, Annur, Chidambaram, Nagapattinam & Contai, 3 each, Puducherry, Chennai, Karaikal, Tondi, Kodavasal, Adirampattinam & Sankalan 2 each, Anandpur, Sirkali, Perungalur, Polur, Narsapur & Ongole 1 each
19.	Gulmarg 1	Coonoor 9, Chengam 5, Polur 4, Arani, Tiruvannamalai & Kodaikanal 2 each, Palampur, Gulmarg, Bhuntar, Panruti, Kundha Bridge, Sathanurdam, Tiruvarur, Vilathikulam, Gingee, Gangtok, Tadong, Karaikal, Kanyakumari & Alapuzha 1 each
20.	Nil	Kottayam 5, Coonoor 4, Tiruchendur 3, Mettupalayam, Tuticorin & Sankalan 1 each
21.	Nil	Nil
22.	Tezu 1	Gulmarg 3, Udaipur, Banihal & Batote 2 each, Katra, Bhaderwah, Pahalgam, Kupwara & Agathi 1 each
23.	Nil	Nancowry 1
24.	Nil	Nil
25.	Nil	Bahraich 5, Bundi 3,Chittorgarh, Shashpura & Guna 2 each, Ajmer, Kota, Sheopur & Udaipur 1 each
26.	Nil	Golaghat 3, Tangla, North Lakhimpur, Jorhat, Itanagar, Bhalukpong & Sankalan 2 each, Khanitar, Hasimara, Tadong, Krishnanagar, Tusuma, Gulmarg, Tezpur, Dibrugarh, Mazbat, Chouldhowaghat, Dharamtul, Sibsagar, NH Xing, Gangtok, Bhuntar, Batote & Daporijo 1 each
27.	Kundha Bridge 2	Bhuntar, Banihal, Punalur, Sankalan, Palampur, Batote & Gulmarg 3 each, Tissa, Dharamsala, Gangtok & Tadong 2 each, Katra, Bhaderwah, Pahalgam, Kupwara, Passighat & Jammu 1 each

TABLE 6 (*Contd.*)

(1)	(2)	(3)
28.	Ramanathapuram 11, Pamban 7, Mudukulathur, Paramakudi & Ottapidaram 4 each, Coonoor, Kamudhi, Tondi, Tuticorin, Palayamkottai, Quazigund & Amini Divi 3 each, Melur, Ayikudi, Sankarankoil, Shenkottah, Tenkasi, Srivaikuntam, Tiruchendur, Vilathikulam, Kovilpatti, Virudhunagar & Kodaikanal 2 each, Pahalgam, Coimbatore, Madurai, Mettupalayam, Udumalpet, Natham, Sattur, Nancowry, Piravom, Anantnag & Kukernag 1 each	Bhuntar 8, Bhoranj & Sujanputtra 7 each, Ghumarwin & Gohar 6 each, Ambala, Jogindernagar, Palampur & Banihal 5 each, Gulmarg 4, Bhaderwah, Udhampur, Katra, Shimla, Sundernagar, Mukteswar & Tehri 3 each, Bikaner, Srinagar, Quazigund, Chandigarh, Dehra Dun, Midnapur & Adampur 2 each, Kupwara, Churu, Pilani & Amritsar 1 each
29.	Paramakudi 4, Amini Divi 3, Ambasamudram 2, Ayikudi, Nanguneri, Sankarankoil, Quazigund, Shenkotta, Tenkasi, Tiruchendur & Tuticorin 1 each	Nil
30.	Nilokheri 1	Nil
31.	Mukteswar 2, Karnal 1	Nil

each in Himachal Pradesh and Jammu & Kashmir and on 3 days in Uttarakhand.

Heavy rain/snow occurred on 1 day in Himachal Pradesh.

Rain or thundershowers occurred *at most places* on: 6 days in Sub-Himalayan West Bengal & Sikkim; 3 to 4 days in Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, east Uttar Pradesh, Haryana, Chandigarh & Delhi and Punjab and on 1 to 2 days in Arunachal Pradesh, Assam & Meghalaya, Orissa and west Uttar Pradesh; *at many places* on: 4 days in Assam & Meghalaya, 3 days in Arunachal Pradesh; 2 days in Nagaland-Manipur-Mizoram-Tripura and on 1 day each in west Bengal & Sikkim, Haryana, Chandigarh & Delhi, Punjab and Chattisgarh; *at a few places* on 8 days in Sub-Himalayan West Bengal & Sikkim, 6 days in Arunachal Pradesh and Jharkhand, 2 to 4 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Bihar, east Uttar Pradesh, Haryana, Chandigarh & Delhi, Punjab and Madhya Pradesh and on 1 day each in Orissa, west Uttar Pradesh, east Rajasthan, Konkan & Goa and Chattisgarh and *at isolated places* on: 7 to 10 days in Arunachal Pradesh, Assam & Meghalaya, Gangetic West Bengal, Orissa, Rajasthan, coastal Andhra Pradesh and Tamil Nadu; 4 to 6 days in west Uttar Pradesh, Punjab, Madhya Pradesh, Gujarat state, Telangana and Kerala and on 1 to 3 days in Andaman & Nicobar Islands, Sub-Himalayan West Bengal & Sikkim, Jharkhand, Bihar, east Uttar Pradesh, Haryana, Chandigarh & Delhi, Konkan & Goa, Madhya Maharashtra, Vidarbha, Chattisgarh, coastal Andhra Pradesh, Rayalaseema, south interior Karnataka and Lakshadweep.

Very heavy rain occurred on 1 day in Orissa. *Heavy rain* also occurred on 2 days in Tamil Nadu and on 1 day each in Sub-Himalayan West Bengal & Sikkim, Orissa, Haryana, Chandigarh & Delhi, west Rajasthan and Chattisgarh.

3.2.2. *Monthly rainfall*

Monthly rainfall was *excess* in 19 meteorological sub-divisions, *viz.*, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Gangetic West Bengal, Orissa, Jharkhand, Bihar, east Uttar Pradesh, west Uttar Pradesh, Uttarakhand, Haryana, Chandigarh & Delhi, Punjab, Himachal Pradesh, west Rajasthan, east Rajasthan, west Madhya Pradesh, east Madhya Pradesh, Saurashtra & Kutch and Chattisgarh; *normal* in 3; *viz.*, Arunachal Pradesh, Jammu & Kashmir and coastal Andhra Pradesh; *deficient* in 2, *viz.*; Telangana and Rayalaseema, *scanty* in 10; *viz.*, Andaman & Nicobar Islands, Gujarat region, Konkan & Goa, Vidarbha, Tamil Nadu, coastal Karnataka, north interior Karnataka, south interior Karnataka, Kerala and Lakshadweep. There was no rain in the remaining two

met. sub-divisions, *viz*., Madhya Maharashtra and Marathawada.

Sub-divisionwise percentage departure and principal amounts of rainfall for the month of February are given in Tables 1 and 6 respectively.

3.2.3. *Temperature*

Cold wave conditions prevailed on 5 days in Uttarakhand and on a few days in Assam & Meghalaya, Orissa, Jharkhand, Punjab and Madhya Maharashtra. *Cold day* conditions also prevailed on 1 day each in Orissa, Jharkhand, Haryana, Chandigarh & Delhi, Punjab and west Rajasthan.

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 5. Same date appearing in two different columns of sub-divisions may be reckoned as occurrence of that category over parts of the sub-divisions. Minimum temperatures were normal for the rest of the days.

During the month, the lowest minimum temperature of 4.4° C was recorded at Adampur (Punjab) on 17 & 20 February 2007.

3.2.4. *Disastrous weather events and damage*

Various incidents related to heavy rains and squally winds claimed the lives of 19 people in Uttar Pradesh, 10 in Madhya Pradesh and 2 in Kerala. Thundershowers, lightning and hailstorm claimed 8 lives in Vidarbha, 3 each in Sikkim and Jharkhand, 2 in Orissa and 1 in Assam. Hailstorm and heavy rain damaged many acres of agriculture in Tripura, Jharkhand, West Bengal, Vidarbha, Mizoram and Madhya 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 at least 2.5 mm rainfall.

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

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

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

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

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

Temperature

As per the revised criteria for declaring cold wave, the actual minimum temperature of a station is reduced to 'Wind Chill Effective Minimum Temperature' (WCTn) based on the wind chill factor using the Table given in WMO No. 331/Technical note No. 123. For declaring cold wave etc. WCTn only is used and when it is $\leq$ 10° C only, cold wave is considered (this criteria does not hold for coastal 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 $\geq$ 10° C and –6° C or less elsewhere.

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

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

Markedly below normal - departure of minimum temperature from normal is from –5° C to –6° C for the region where the normal minimum temperature is 10° C or more and from –3° C to –4° C 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 above normal - departure of minimum temperature from normal is + 5° C to + 6° C.

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

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