MAUSAM, **58**, 1 (January 2007), 143-152

Weather in India

WINTER SEASON (January-February 2006)†

1. Introduction

Though the temperature effect of the winter season (January – February) 2006 was short lived, it was quite severe and mainly manifested as lingering severe cold wave conditions over the northern parts of the country and also in terms of the lowest temperatures reported by some of the cities. Dal Lake in Jammu & Kashmir froze in the first week of January, after a gap of about 20 yrs. The capital city 'Delhi' recorded a lowest minimum of 0.2° C on 8 January. This was the first time after 70 years that Delhi temperature fell to near zero value. The record minimum temperature was -0.6° C on 16 January 1935.

The main synoptic situation causing such weather had been the active low index mid latitude circulation pattern. Apart from that, the equatorial easterly wave also had been active, giving moderate weather over the southern peninsula. A deep depression formed in the near equatorial region over the Arabian Sea during 13 & 14 January and weakened in situ without affecting the weather over the country. This is the first ever system to form over the Arabian Sea in January in the recorded history of storms & depressions.

Unlike last year, rainfall had been sparse, with only the hilly regions of northern most parts receiving *normal*/ *excess** rainfall.

2. Seasonal rainfall (January-February)

The seasonal rainfall was : *excess* only in Jammu & Kashmir; *normal* in 2 Met. sub-divisions, *viz.*, Arunachal Pradesh and Assam & Meghalaya; *deficient* in 3, *viz.*, Himachal Pradesh, Tamil Nadu and Lakshadweep and *scanty* in 16, *viz.*, Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Orissa, Jharkhand, west Uttar Pradesh, Uttaranchal, Haryana, Punjab, west Rajasthan, east Rajasthan, coastal Andhra Pradesh, Rayalaseema, coastal Karnataka, south interior Karnataka and Kerala. The remaining 14 Met. sub-divisions remained mainly dry.

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

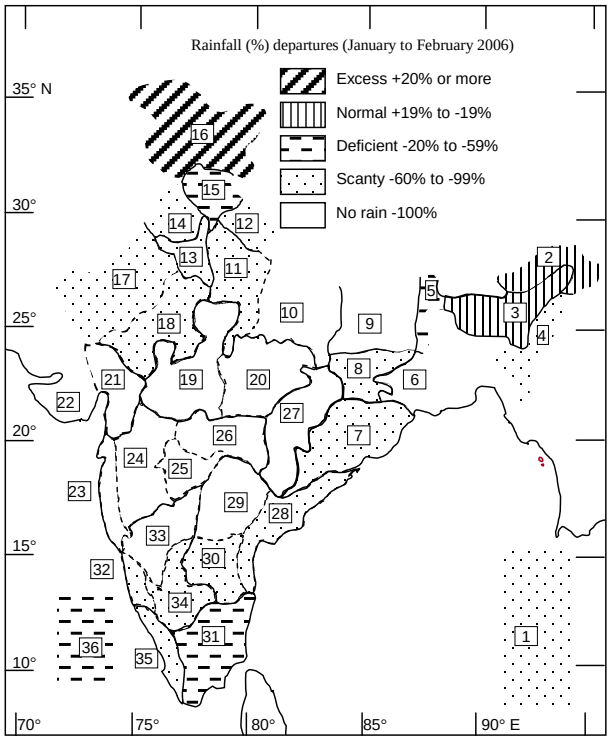

Fig. 1. Sub-divisionwise seasonal rainfall departure from normal (%) for winter season (January - February 2006). Sub-divisions are indicated by number on the map & bold letters in legend. The rainfall anomaly values for these 36 sub-divisions are indicated below :

1	–64	**7**	–99	**13**	–93	**19**	–100	**25**	–100	**31**	–56
2	–1	**8**	–99	**14**	–77	**20**	–100	**26**	–100	**32**	–73
3	3	**9**	–100	**15**	–48	**21**	–100	**27**	–100	**33**	–100
4	–68	**10**	–100	**16**	35	**22**	–100	**28**	–98	**34**	–97
5	–76	**11**	–99	**17**	–97	**23**	–100	**29**	–100	**35**	–66
6	–100	**12**	–88	**18**	–99	**24**	–100	**30**	–95	**36**	–37

3. Monthly features

3.1. January

3.1.1. *Weather and associated synoptic features*

3.1.1(a). *Deep depression over the southeast Arabian Sea (13 – 14 January 2006) (The first system ever to form in the month over the Arabian Sea)*

In the equatorial easterly wave, a depression formed over the Comorin area which lay centred at 1200 UTC of

* meanings of words in *Italics* other than subtitles are given in Appendix

†*Compiled by* : N. Jayanthi, R. R. Lele & Sunitha Devi S., Meteorological Office, Pune – 411 005, India

TABLE 1

Sub-division wise rainfall (mm) for each month and season as a whole (January-February 2006)

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	16	56	-71	14	29	-52	30	85	-64
2.	Arunachal Pradesh	5	49	-90	132	89	48	137	138	-1
3.	Assam & Meghalaya	1	18	-97	45	27	70	46	45	3
4.	Naga., Mani., Mizo. and Tri.	**	14	-97	13	27	-52	13	41	-68
5.	S. H. W. B. & Sikkim	**	19	-99	11	30	-61	12	49	-76
6.	Gangetic West Bengal	0	13	-100	0	19	-100	0	32	-100
7.	Orissa	**	12	-98	0	20	-100	**	32	-99
8.	Jharkhand	0	19	-99	0	21	-100	0	39	-99
9.	Bihar	0	17	-100	0	12	-100	0	28	-100
10.	East Uttar Pradesh	0	19	-100	0	14	-100	0	33	-100
11.	West Uttar Pradesh	**	20	-98	0	16	-100	**	36	-99
12.	Uttaranchal	13	60	-78	1	56	-98	14	116	-88
13.	Haryana, Chandigarh & Delhi	2	20	-89	**	16	-98	3	36	-93
14.	Punjab	9	27	-66	3	24	-89	12	51	-77
15.	Himachal Pradesh	66	100	-34	33	92	-65	99	192	-48
16.	Jammu & Kashmir	226	106	113	90	128	-30	316	234	35
17.	West Rajasthan	**	4	-94	0	4	-100	**	8	-97
18.	East Rajasthan	0	6	-100	0	5	-99	0	11	-99
19.	West Madhya Pradesh	0	11	-100	0	6	-100	0	17	-100
20.	East Madhya Pradesh	0	26	-100	0	19	-100	0	45	-100
21.	Gujarat Region	0	1	-100	0	1	-100	0	2	-100
22.	Saurashtra & Kutch	0	1	-100	0	1	-100	0	2	-100
23.	Konkan & Goa	0	1	-100	0	**	-100	0	1	-100
24.	Madhya Maharashtra	0	2	-100	0	1	-100	0	4	-100
25.	Marathwada	0	3	-100	0	3	-100	0	7	-100
26.	Vidarbha	0	11	-100	0	11	-100	0	22	-100
27.	Chattisgarh	0	13	-100	0	14	-100	0	27	-100
28.	Coastal Andhra Pradesh	**	7	-95	0	9	-100	**	15	-98
29.	Telangana	0	4	-100	0	6	-100	0	10	-100
30.	Rayalaseema	**	3	-90	0	3	-100	**	7	-95
31.	Tamil Nadu	15	21	-26	**	14	-99	16	35	-56
32.	Coastal Karnataka	1	2	-67	0	**	-100	1	2	-73
33.	North interior Karnataka	0	2	-100	0	3	-100	0	5	-100
34.	South interior Karnataka	**	2	-93	0	3	-100	**	5	-97
35.	Kerala	9	11	-20	1	17	-96	10	28	-66
36.	Lakshadweep	23	20	13	0	17	-100	23	37	-37

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

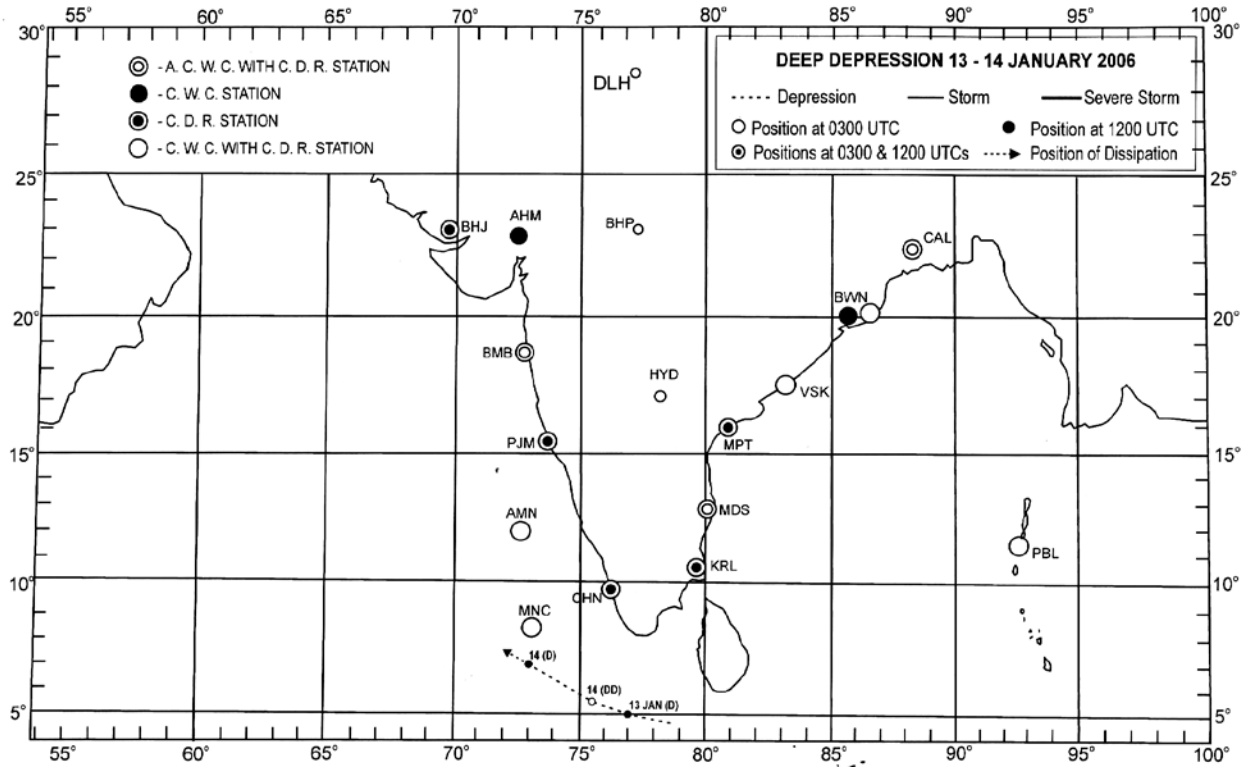

Fig. 2. Track of deep depressions over the southeast Arabian Sea during 13-14 January 2006

13 near Lat. 5.0° N / Long. 77.0° E. It further intensified into a deep depression and lay centred at 0300 UTC of 14 near Lat. 5.5° N / Long. 75.5° E. Moving slightly north westwards, it weakened into a depression and lay centred at 1200 UTC of 14 near Lat. 7.0° N / Long. 73.0° E, about 150 km south of Minicoy. It further weakened into a well marked low pressure area over the southeast Arabian Sea at 0300 UTC of 15, into a low pressure area over there on 16 and became less marked on 17.

Track of the system is shown in Fig. 2.

3.1.1(b). *Other systems*

There were 14 systems in the westerlies including 8 upper air cyclonic circulations, 2 troughs in mid and upper tropospheric westerlies, an induced low pressure area, 3 induced upper air cyclonic circulations and a trough in the easterlies affecting the weather over the country. Details of these systems are given in Table 2.

Rain/snow occurred *at many to most places* on a few number of days in Uttaranchal (1), Himachal Pradesh (4) and Jammu & Kashmir (5); *at a few places* in Himachal Pradesh (1) and Jammu & Kashmir (4) and *at isolated places* in Uttaranchal and Himachal Pradesh (3 each) and in Jammu & Kashmir (6). Also *heavy rain* or snow occurred on 2 days in Jammu & Kashmir.

Rain/thundershowers occurred *at many places* on a few number of days in Andaman & Nicobar Islands (3) and in Punjab (1); *at a few places* in Andaman & Nicobar Islands and Lakshadweep (6 each); in Tamil Nadu (3) and in Haryana, Punjab and Kerala (1 each) and *at isolated places* on: 6 to 8 days in Tamil Nadu and Kerala and on 1 to 3 days in Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Orissa, Haryana, Punjab, west Rajasthan, coastal Andhra Pradesh and coastal & south interior Karnataka.

3.1.2. *Monthly rainfall*

Monthly rainfall was *excess* only in Jammu & Kashmir; *normal* in Lakshadweep; *deficient* in 3 Met. sub-divisions, *viz*., Himachal Pradesh, Tamil Nadu and Kerala and *scanty* in 16, *viz.*, Andaman & Nicobar Islands, Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Sub-Himalayan West Bengal & Sikkim, Orissa, Jharkhand, west Uttar Pradesh,

TABLE 2

Details of the weather systems during January 2006

S. No	System	Duration	Place of first location	Direction of movement	Final location	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**A**) *Depression*						
1.	Deep depression	13 – 14	Comorin area	Northwest	Southeast Arabian Sea	Details are given in text
(**B**) *Western disturbances/eastward moving systems*						
(*i*) *Upper Air Systems*						
1.	Upto mid tropospheric levels	2 – 4	North Pakistan and adjoining Jammu & Kashmir	Eastnortheast	Jammu & Kashmir and neighbourhood	Moved away on 5
2.	Do	5 – 6	Do	Northeast	Do	Moved away on 7
3.	Do	7 – 12	Do	Do	Eastern parts of Jammu & Kashmir	Moved away on 13
4.	Do	12 – 14	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 15
5.	Do	15 – 19	North Pakistan, adjoining Jammu & Kashmir and Punjab	Do	Eastern parts of Jammu & Kashmir	Moved away on 20
6.	Do	19 – 21	Do	Do	Jammu & Kashmir and neighbourhood	Moved away on 22
7.	Do	21 eve – 26	Do	Do	Eastern parts of Jammu & Kashmir	Moved away on 27
8.	Do	26 – 31	North Pakistan and adjoining Jammu & Kashmir	Eastnortheast	Jammu & Kashmir and neighbourhood	Moved away on 1 February
9.	Trough in mid & upper tropospheric westerlies	1 – 6	Along Long.67° E, north of Lat.20° N	East	Along Long.70° E, north of Lat.25° N	Became less marked on 7
10.	Do	23 – 25	Along Long.65° E, north of Lat.20° N	East	East Uttar Pradesh to coastal Andhra Pradesh	Became less marked on 26
(*ii*) *Induced systems*						
1.	Cyclonic circulation in the lower tropospheric levels	8 – 9	Haryana and neighbourhood	Quasi-stationary	*In situ*	Became less marked on 10
2.	Do	10 – 12	Central Pakistan and adjoining west Rajasthan	East	West Rajasthan and neighbourhood	Became less marked on 13
3.	Low pressure area	17 – 18	North Rajasthan and neighbourhood	Do	Haryana and adjoining Uttaranchal and neighbourhood	Became less marked on 31
4.	Cyclonic circulation in the lower tropospheric levels	28 eve – 30	Central Pakistan and adjoining northwest Rajasthan	Do	West Rajasthan and neighbourhood	Became less marked on 31
(**C**) *Trough in the easterlies*						
1.	At sea level	19 – 30	South Andaman Sea and adjoining southeast Bay	West	Maldives and adjoining Lakshadweep areas	Became less marked on 31

TABLE 3

Details of the weather systems during February 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 systems*					
(*i*)	*Upper air cyclonic circulation*					
1.	Upto mid tropospheric levels	1 – 4	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 5
2.	Do	3 – 7	Afghanistan and adjoining north Pakistan	Eastnortheast	Eastern parts of Jammu & Kashmir	Moved away on 8
3.	Do	7 eve – 11	North Pakistan and adjoining Jammu & Kashmir	Northeast	Jammu & Kashmir and neighbourhood	Moved away on 12
4.	Upto lower tropospheric levels	5 – 12	Assam & Meghalaya and neighbourhood	Quasi-stationary	*In situ*	Became less marked on 13
5.	Upto mid tropospheric levels	12 – 16	North Pakistan and adjoining Jammu & Kashmir	Eastnortheast	Eastern parts of Jammu & Kashmir	Moved away on 17
6.	Do	16 – 19	Do	Do	Do	Moved away on 20
7.	Do	19 – 23	Do	Do	Do	Moved away on 24
8.	Do	24 – 27	Do	Do	Do	Moved away on 28
9.	Trough in the lower level westerlies	14 – 15	Sub-Himalayan West Bengal & Sikkim to north Bay	East	Arunachal Pradesh to north Bay	Moved away on 16
10.	Do	16 – 27	Do	Quasi-stationary	*In situ*	Became less marked on 28
(*ii*)	*Induced cyclonic circulations*					
1.	Upto lower tropospheric levels	31 Jan – 2 Feb	South Pakistan and adjoining west Rajasthan	East	West Rajasthan and neighbourhood	Became less marked on 3
2.	Do	1 – 2	West Rajasthan and neighbourhood	Quasi-stationary	*In situ*	Became less marked on 3
3.	Do	8 – 9	West Rajasthan and neighbourhood	Do	Do	Became less marked on 10
4.	Do	12 – 13	Central Pakistan and adjoining west Rajasthan	Do	Do	Became less marked on 14
5.	Do	22 – 23	South Pakistan and adjoining west Rajasthan	East	West Rajasthan	Became less marked on 24
(**B**)	*Other cyclonic circulations*					
1.	Upto lower tropospheric levels	5 – 12	Assam & Meghalaya and neighbourhood	Do	Do	Became less marked on 13

TABLE 3 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(**C**)	*Trough in the easterlies*					
1.	At sea level	31 Jan – 1 Feb	Southwest Bay	East	West Rajasthan	Became less marked on 2
2.	Do	3 – 6	Southeast Bay	West	Lakshadweep & Maldives areas	Moved away on 7
3.	Do	4 – 15	Andaman Sea and adjoining southeast Bay	Do	Do	Moved away on 16
4.	Do	9 – 16	South Andaman Sea	Do	Southwest & adjoining southeast Bay	Became less marked on 17
5.	Do	17 – 26	South Andaman Sea	West	Maldives and adjoining Lakshadweep area	Moved away on 27
6.	Lower levels	21 – 22	South Tamil Nadu to north Madhya Maharashtra	Quasi-stationary	*In situ*	Became less marked on 23
7.	At sea level	24 Feb – 4 Mar	South Andaman Sea	West	Lakshadweep – Maldives areas	Moved away on 5 March

Uttaranchal, Haryana, Punjab, west Rajasthan, coastal Andhra Pradesh, Rayalaseema and coastal & south interior Karnataka. The remaining 15 sub-divisions were mainly dry during the month.

Sub-division wise percentage departure and principal amounts of rainfall for the month of January are given in Tables 1 and 4 respectively.

3.1.3. *Temperature*

Severe cold wave conditions prevailed on 4 days in Haryana and on 1 to 3 days in Bihar, Uttar Pradesh, Punjab and Rajasthan. *Cold wave conditions* prevailed on 4 to 7 days in Bihar, Uttar Pradesh, Punjab, Rajasthan, Madhya Maharashtra, Marathwada, Vidarbha, Telangana and south interior Karnataka and on 1 to 3 days in Orissa, Jharkhand, Haryana, Himachal Pradesh, Jammu & Kashmir, Madhya Pradesh, Gujarat State, Chattisgarh, Tamil Nadu and north interior Karnataka.

Night temperatures were *appreciably* to *markedly below normal* on 11 to 16 days in Orissa, Jharkhand, Gujarat region and south interior Karnataka; on 4 to 10 days in Bihar, east Uttar Pradesh, Haryana, Punjab, Jammu & Kashmir, east Rajasthan, Madhya Pradesh, Madhya Maharashtra, Vidarbha, Chattisgarh, Telangana, Rayalaseema, Tamil Nadu and on 1 to 3 days in Gangetic West Bengal, west Uttar Pradesh, west Rajasthan, Konkan & Goa, Marathwada, coastal Andhra Pradesh, north interior Karnataka and Kerala; *below normal* on 7 to 11 days in Assam & Meghalaya, Orissa, Jharkhand, Bihar, west Rajasthan, Konkan & Goa, Marathwada, Chattisgarh, Rayalaseema, Tamil Nadu and south interior Karnataka and on 4 to 6 days in Uttar Pradesh, Uttaranchal, Haryana, Punjab, Jammu & Kashmir, east Rajasthan, Gujarat region, Madhya Maharashtra, Marathwada, Vidarbha, coastal Andhra Pradesh, Telangana and coastal & north interior Karnataka and on 1 to 3 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, West Bengal & Sikkim, Madhya Pradesh, Saurashtra & Kutch and Kerala.

Night temperatures were *appreciably* to *markedly above normal* on 9 to 17 days in Sub-Himalayan West Bengal & Sikkim, Haryana, Rajasthan, Madhya Pradesh, Saurashtra & Kutch and on 4 to 8 days in Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, west Uttar Pradesh, Punjab, Jammu & Kashmir, Gujarat region, Konkan & Goa, Madhya Maharashtra,

TABLE 4

Principal amounts of rainfall (cm) over different stations for the months of January and February 2006

Date (1)	January (2)	February (3)
1	Quazi Gund 1	Nil
2	Kupwara 7, Banihal 4, Quazi Gund & Batote 3 each, Lansdown, Srinagar, Kukernag & Badarwah 2 each	Nil
3	Banihal, Batote & Quazi Gund 10 each, Badarwah 5, Kukernag, Avantipur, Srinagar & Hamirpur 4 each, Tehri & Kangra 3 each	Nil
4	Car Nicobar & Hut Bay 1 each	Nil
5	Chidambaram 4, Kattumannarkoil, Karaikal & Nagapattinam 1 each	Miao 5, Namsai & Dillighat 3 each, Itanagar & Dharamtul 2 each, Dibrugarh, Khowang, Tezpur & North Lakhimpur 1 each
6	Pamban 4, Kattumannarkoil 3, Karaikal, Nagapattinam & Ambalavayal 2 each, Piravom, Kottayam, Nedumangad & Nancowry 1 each	Nil
7	Minicoy 1	Nil
8	Pamban 4, Sriperumbudur 3, Shivagangai 2, Chittur & Minicoy 1 each	Nil
9	Cannur 7, Kothagiri 5, Chatrapatti 4, Coimbatore 3, Karaikal, Tiruchirapalli & Alapuzha 1 each	Nil
10	Ambasamudram 2, Covelong, Car Nicobar & Minicoy 1 each	Nil
11	Nancowry 1	Nil
12	Nil	Car Nicobar 1
13	Nil	Pahelgam & Shalimar 2 each
14	Minicoy & Shenkottah 2 each, Nagapattinam 1	Dibrugarh & Itanagar 1 each
15	Kanyakumari 5, Nanguneri 4, Kupwara, Gulmarg, Pamban & Tiruchendur 3 each, Palayamkottai 2, Minicoy, Bhuntar, Pahelgam & Shalimar 1 each	Dhundhi 4, Kupwara 3, Batote, Pahelgam, Katra, Bhang, Bihubar, Roing & Itanagar 2 each, Dibrugarh & Banihal 1 each
16	Badarwah 10, Banihal 8, Bhuntar 7, Tissa 5, Kumarsain 4, Radhapuram 3, Quazi Gund, Katra & Udhampur 2 each, Kodaikanal 1	Itanagar, Sibsagar, Neemalighat & Bhuntar 5 each, Tezu, Jorhat, Imphal, Kohima & Miao 3 each, Rampur & Passighat 2 each, Dibrugarh 1
17	Shrivaikuntam 10, Dhundhi 9, Batote & Banihal 7 each, Nanguneri 6, Kumarsain 5, Solan, Dharmpur & Tissa 4 each, Kozha & Tuticorin 3 each, Chandigarh & Thiruvananthapuram 2 each	Cherrapunji 11, Roing & Khowang 6 each, Tezu & Namsai 5 each, Miao, Dibrugarh & Silchar 4 each, Sibsagar & Nagarkata 3 each, Passighat & Murti 2 each, Imphal 1
18	Banihal 10, Batote 8, Quazi Gund 6, Katra 5, Kanyakumari 4, Kukernag, Guler, Nagrota, Jammu, Udhampur & Avantipur 3 each, Leh 2	Dholabazar 5, Silchar & Nancowry 3 each, Beki & NH-Xing 2 each, Cherrapunji, Hasimara & Diana 1 each
19	Batote & Quazi Gund 2 each, Banihal, Pahelgam, Kukernag & Gulmarg 1 each	Nil
20	Bhund 3, Solangnala 1	Banihal 1
21	Banihal 1	Itanagar & Cherrapunji 2 each, Dibrugarh, Seppa, North Lakhimpur, Passighat & Khanitar 1 each
22	Nil	Itanagar 4, Miao, Murti & north Lakhimpur 2 each, Seppa, Tezpur, Dhubri, Champasari, Jalpaiguri & Car Nicobar 1 each
23	Nil	Miao, Sibsagar & Khowang 3 each, Dillighat & Car Nicobar 2 each, Dibrugarh, Seppa, Namsai, Zero, Itanagar, Khonsa & Jorhat 1 each
24	Nil	Roing 4, Itanagar 3, Dillighat 2, Dibrugarh, Khowang, North Lakhimpur, Dholabazar & Nancowry 1 each
25	Gopalpur 1	Roing 5, Itanagar 2, Passighat, Namsai, Dibrugarh & Dillighat 1 each

TABLE 4 (*Contd.*)

(1)	(2)	(3)
26	Nil	Banihal 8, Batote 5, Kupwara & Srinagar 4 each, Avantipur & Quazi Gund 3 each, Bhalukpong 2, Roing, Itanagar, Keylong, Amritsar & Bhuntar 1 each
27	Nil	Ghamroor 7, Badarwah & Passighat 5 each, Quazi Gund 4, Kukernag, Dhundhi & Banihal 3 each, Surian & North Lakhimpur 2 each
28	Kupwara 2	Passighat 5, Punalur 3, Chouldhowaghat 2, Dibrugarh, North Lakhimpur & Valparai 1 each
29	Kupwara 1	Nil
30	Nil	Nil
31	Nil	Nil

Marathwada, coastal Andhra Pradesh, Telangana and on 1 to 3 days in Orissa, Jharkhand, Bihar, east Uttar Pradesh, Himachal Pradesh, Vidarbha, Chattisgarh, Rayalaseema and Tamil Nadu and *above normal* on 14 days in Sub-Himalayan West Bengal & Sikkim; on 4 to 8 days in Gangetic West Bengal, Orissa, west Uttar Pradesh, Uttaranchal, Jammu & Kashmir, Gujarat region, Konkan & Goa, Madhya Maharashtra, Chattisgarh, coastal Andhra Pradesh, Telangana, Tamil Nadu, coastal and south interior Karnataka and Kerala and on 1 to 3 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Jharkhand, Bihar, east Uttar Pradesh, Haryana, Punjab, Himachal Pradesh, Rajasthan, Madhya Pradesh, Saurashtra & Kutch, Marathwada, Vidarbha, Rayalaseema and north interior Karnataka.

The month's and the season's lowest minimum temperature over the plains was –2.9° C recorded at Pilani Churu (west Rajasthan) on 8 January 2006.

3.1.4. *Disastrous weather events and damage*

Cold wave claimed the lives of 281 people in the northern parts of the country, out of which 51 deaths were reported in Bihar alone. Also due to *heavy rains* and thunderstorm, the roofs of houses, 100 TVs and many electrical appliances were burnt in Tirunelveli district of Tamil Nadu.

3.2. *February*

3.2.1. *Weather and associated synoptic features*

There were 15 western disturbances (including 5 induced cyclonic circulations and 2 troughs in upper tropospheric westerlies), 1 upper air cyclonic circulation and 7 troughs in the easterlies which affected the weather over the country during the month of February. Details of these systems are given in Table 3.

Rain/snow occurred: *at many places* on two days in Jammu & Kashmir; *at a few places* on 1 day each in Himachal Pradesh and Jammu & Kashmir and *at isolated places* on 3 to 4 days in Himachal Pradesh and Jammu & Kashmir. Heavy rain also occurred on 1 day in Jammu & Kashmir.

Rain or thundershowers occurred *at most places* on 1 day in Arunachal Pradesh; *at many places* on 9 days in Arunachal Pradesh and on 1 to 2 days in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim and west Rajasthan; *at a few places* on 4 to 6 days in Andaman & Nicobar Islands, Assam & Meghalaya and on 1 to 3 days in Arunachal Pradesh and Sub-Himalayan West Bengal & Sikkim and *at isolated places* on: 8 to 10 days in Andaman & Nicobar Islands, Assam & Meghalaya and Sub-Himalayan West Bengal & Sikkim and on 1 to 4 days in Arunachal Pradesh, Nagaland-Manipur-Mizoram-Tripura, Haryana, Tamil Nadu and Kerala. *Heavy rain* occurred on one day in west Rajasthan.

3.2.2. *Monthly rainfall*

Monthly rainfall was *excess* in 2 meteorological sub-divisions *viz.*, Arunachal Pradesh and Assam & Meghalaya; *deficient* in 3 *viz.*, Andaman & Nicobar Islands, Nagaland-Manipur-Mizoram-Tripura and Jammu & Kashmir and *scanty* in 8 *viz.*, Sub-Himalayan West Bengal & Sikkim, Uttaranchal, Haryana, Punjab, Himachal Pradesh, east Rajasthan, Tamil Nadu and Kerala. There was no rain in the remaining 23 Met. sub-divisions.

Sub-division wise percentage departure and principal amounts of rainfall for the month of February are given in Tables 1 and 4 respectively.

3.2.3. *Temperature*

Cold wave conditions prevailed on 4 to 5 days in interior Karnataka and on one day each in Telangana, Rayalaseema and Tamil Nadu.

Night temperatures were *appreciably* to *markedly below normal* on 19 days in south interior Karnataka; on 16 days each in Rayalaseema and north interior Karnataka; 8 to 10 days in Orissa, Telangana and Tamil Nadu; 3 to 5 days in Madhya Maharashtra, Marathwada, Chattisgarh, coastal Andhra Pradesh and coastal Karnataka and on 1 to 2 days in Jharkhand, west Madhya Pradesh, Gujarat region, Konkan & Goa and Kerala; were *below normal* on 15 days in Tamil Nadu; on 8 to 12 days in Madhya Maharashtra, coastal Andhra Pradesh and Telangana; on 4 to 7 days in Orissa, Marathwada, Vidarbha, Rayalaseema, coastal & south interior Karnataka and Kerala and on 1 to 3 days in Jharkhand, east Madhya Pradesh, Gujarat region, Konkan & Goa, Chattisgarh and north interior Karnataka.

They were *appreciably* to *markedly above normal* on 25 to 30 days in Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Rajasthan and Saurashtra & Kutch; on 22 to 24 days in Uttar Pradesh, Uttaranchal, Haryana, Himachal Pradesh, Jammu & Kashmir, west Madhya Pradesh, Gujarat region; on 14 to 17 days in Nagaland-Manipur-Mizoram-Tripura, Gangetic West Bengal, Bihar, Punjab, east Madhya Pradesh and Chattisgarh; on 7 to 11 days in Arunachal Pradesh, Orissa, Jharkhand, Konkan & Goa, Madhya Maharashtra and Marathwada and on 1 day each in Vidarbha, coastal Andhra Pradesh and Tamil Nadu and were *above normal* on 8 to 12 days in east Madhya Pradesh, Konkan & Goa and Madhya Maharashtra; on 4 to 7 days in Arunachal Pradesh, Assam & Meghalaya, Nagaland-Manipur-Mizoram-Tripura, Orissa, Bihar, east Uttar Pradesh, Punjab, Madhya Pradesh, Marathwada, Vidarbha and Chattisgarh and on 1 to 3 days in West Bengal & Sikkim, Jharkhand, west Uttar Pradesh, Uttaranchal, Haryana, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Saurashtra & Kutch, coastal Andhra Pradesh, Tamil Nadu coastal Karnataka and Kerala.

During the month, the lowest minimum temperature of 5° C was recorded at Amritsar (Punjab) on 3 February 2006.

3.2.4. *Disastrous weather events and damage*

No disastrous weather event was reported during the month.

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 or more.

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 should be 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.