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Weather in India

WINTER SEASON (JANUARY-FEBRUARY 1998)*

1. Introduction

Andaman & Nicobar Islands and hilly regions of northwest India are the main rainfall belts in winter season. During the season, Himachal Pradesh and Jammu & Kashmir received excess or normal rainfall and Andaman and Nicobar Islands and hills of west Uttar Pradesh received scanty or deficient rainfall. In addition, Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar plateau, Punjab, Vidarbha, coastal Andhra Pradesh and Telangana also received good spells of rain. Rainfall activity was subdued over Peninsular India during the winter season 1998.

Monthwise synoptic features for the season are given in Table 1 and 2 and monthly and seasonal rainfall amounts are given in Table 3.

2. Chief features

(*i*) Well distributed rainfall occurred in Gangetic West Bengal, Bihar plateau, Orissa, Vidarbha, coastal Andhra Pradesh and Telangana and Jammu & Kashmir.

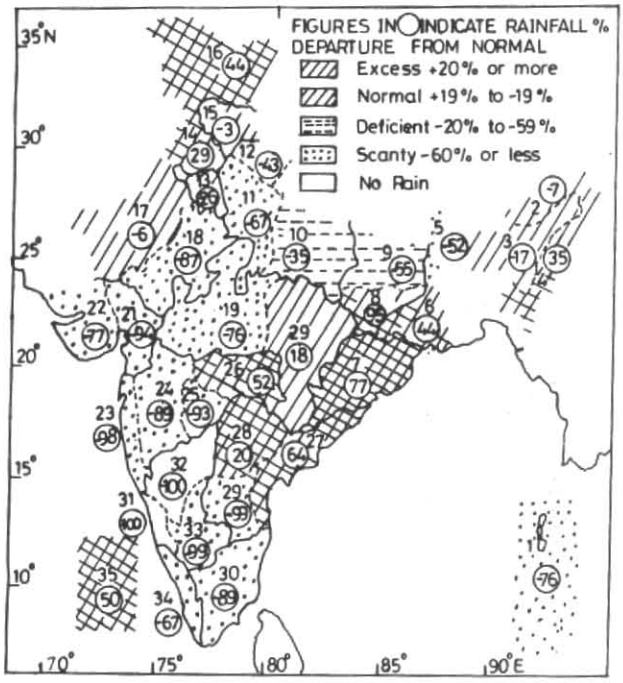
(*ii*) Rain or snow also occurred over northwest India.

(*iii*) Cold wave conditions prevailed over northwest India and west Madhya Pradesh.

3. Season's rainfall

The season's rainfall was excess in 10, normal in 5, deficient in 5 and scanty in 13 meteorological sub-divisions. There was no rain in remaining 2 meteorological sub-divisions (coastal Karnataka and north interior Karnataka).

The season's rainfall was excess in Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar plateau, Punjab, Jammu & Kashmir, Vidarbha, coastal Andhra Pradesh, Telangana and Lakshadweep; normal in Arunachal Pradesh, Assam & Meghalaya, Himachal Pradesh, west Rajasthan and east Madhya Pradesh and deficient in Sub Himalayan, West Bengal, Sikkim, Bihar Plains, east Uttar Pradesh and in hills of west Uttar Pradesh, Haryana, Chandigarh & Delhi. It was scanty over the rest of the country outside coastal and north interior Karnataka where there was no rain.



The seasonal rainfall departures are given in Figure 1.

4. January

4.1. *Weather and associated synoptic features*

There were 7 western disturbances, 14 cyclonic circulations (including 3 embedded cyclonic circulations) and 7 troughs (including 4 east-west troughs) which affected India during the month. Details of these systems are given in Table 1.

Rain or snow occurred either at most places or at many places on 2 days each over Himachal Pradesh and Jammu & Kashmir. Rain or thundershowers occurred either at most places or at many places on 3 to 4 days in Gangetic West Bengal and east Madhya Pradesh and on 1 to 2 days in Nagaland, Manipur, Mizoram & Tripura and Bihar plateau. Rain or thundershowers also occurred either at a few places or at isolated places on most of the days during 18 and 31 January over Gangetic West Bengal, Orissa, Bihar plateau, Vidarbha, coastal Andhra Pradesh, Tamil Nadu and Kerala.

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TABLE 1

Details of the weather systems during January 1998

S. No.	System	Duration	Place of first location	Direction of movement	Place of dissipation	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) *Western disturbances*						
1.	Upper air system	3-6	North Afghanistan	Northeasterly	North Pakistan and adjoining parts of Jammu & Kashmir	Moved away northeastwards
2.	Do	6-10	North Pakistan	Do	Jammu & Kashmir and neighbourhood	Do
3.	Do	11-14	Do	Do	Do	Do
4.	Do	14-18	Do	Do	Do	Do
5.	Do	23-25	Jammu & Kashmir	Do	Do	Do
6.	Do	28-31	North Pakistan and adjoining areas	Do	Do	Do
7.	Do	30 Jan-2 Feb	North Pakistan and neighbourhood	Do	Do	Do
(B) *Induced cyclonic circulations*						
1.	Lower tropospheric levels	7-9	Punjab and adjoining parts of Pakistan	Southeasterly	Central parts of Rajasthan	
(C) *Embedded cyclonic circulations*						
1.	Lower levels	21-23	East Vidarbha and neighbourhood	Northeasterly	Southeast Madhya Pradesh	
2.	Do	22-23	South Telangana and neighbourhood	Stationary	*In situ*	
3.	Do	23-25	Madhya Maharashtra	Quasi-stationary	Madhya Maharashtra and adjoining Gujarat region	A trough from this system to south Kerala coast was observed on 24 and 25
(D) *Other cyclonic circulations*						
1.	Lower tropospheric levels	4-7	South Bangladesh and neighbourhood	Northeasterly	Meghalaya and adjoining parts of Assam	
2.	Lower levels	9-13	Southwest Rajasthan and neighbourhood	Northerly	Northwest Rajasthan	
3.	Do	14-16	Do	Northeasterly	Punjab and neighbourhood	Moved away northeastwards
4.	Do	16-19	North Bangladesh and neighbourhood	Stationary	*In situ*	

TABLE 1 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
5.	Do	18-20	North Vidarbha and neighbourhood	Do	Do	A trough from this system was observed on 18 to south Tamil Nadu. It was also observed to south Tamil Nadu on 19 across interior Karnataka
6.	Do	20-21	Madhya Maharashtra and neighbourhood	Quasi- Stationary	North Madhya Maharashtra and neighbourhood	A westerly trough from this system to south interior Karnataka was observed on 20
7.	Lower tropospheric levels	25-28	North Pakistan and adjoining Jammu & Kashmir	Northeasterly	Jammu & Kashmir and neighbourhood	
8.	Do	25-29	North Assam and neighbourhood	Southeasterly	Nagaland, Manipur, Mizoram & Tripura	A trough from this system was observed extending westwards to east Uttat Pradesh and Bihar on 27. It was seen to Madhya Pradesh across Gangetic West Bengal and Uttar Pradesh on 28. It became less marked on 29
9.	Lower levels	26-29	Saurashtra, Kutch and Gujarat Region	Northesterly	Rajasthan and adjoining areas	
10.	Lower tropospheric levels	29-30	Central parts of Uttar Pradesh	Stationary	*In situ*	
(E) *East-west troughs*						
1.	Lower tropospheric levels	2-4	Bihar Plains to North Assam	Stationary	*In situ*	
2.	Do	7-9	Bihar Plains to Nagaland	Do	Do	
3.	Do	11-12	Do	Do	Do	
4.	Lower levels	13-14	Southwest Uttar Pradesh to west Rajasthan	Stationary	*In situ*	
(F) *Other troughs*						
1.	Lower tropospheric levels	1-2	Plains or west Uttar Pradesh to north Gujarat Region	Do	*In situ*	
2.	Do	21-25	East Uttar Pradesh to south Madhya Maharashtra	Do	Madhya Maharashtra to south Kerala coast	
3.	Sea level chart	26-27	Off Lakshadweep-Maldives areas	Do	*In situ*	

TABLE 2

Details of the weather systems during February 1998

S. No.	System	Duration	Place of first Duration	Direction of movement	Place of dissipation	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)
(A) *Western disturbances*						
1.	Upper air system	6-7	North Pakistan and neighbourhood	Northeasterly	Jammu & Kashmir and neighbourhood	Moved away northeastwards
2.	Do	8-9	North Pakistan and adjoining parts of Afghanistan	Do	North Pakistan and adjoining parts of Afghanistan	Do
3.	Do	10-15	North Pakistan and adjoining Jammu & Kashmir	Do	Jammu & Kashmir and neighbourhood	Do
4.	Do	17-21	Do	Do	Do	Do
5.	Do	22-26	Do	Do	Do	Do
6.	Do	28 Feb-3 Mar	Do	Do	Do	Do
(B) *Induced low pressure area*						
1.	Lower levels	14-15	North Rajasthan and neighbourhood	Eastnortheasterly	North Rajasthan and neighbourhood	Associated cyclonic circulation extended upto lower levels. It was first observed as an induced cyclonic circulation over central Pakistan and adjoining west Rajasthan on 13. It was again observed as an induced cyclonic circulation on 16 over Punjab, adjoining Jammu & Kashmir, Pakistan and as a trough in the lower tropospheric levels over north Punjab to northeast Uttar Pradesh on 17. The trough merged with the other trough on 18 over the same area
2.	Do	18-19	Punjab and adjoining Pakistan	Stationary	*'In situ*	A trough from this system to plains of west Uttar Pradesh was observed on 18 and became less marked on 19. Associated cyclonic circulation lay over Punjab, neighbourhood on 19, over Haryana and adjoining Himachal Pradesh. It moved away across hills of west Uttar Pradesh on 21
3.	Do	23-25	West Rajasthan	Northeasterly	Punjab and adjoining parts of northwest Rajasthan and Haryana	It was first observed as an induced cyclonic circulation on 22 and it was more marked on 23 morning. Associated cyclonic circulation extended upto 3.1 km a.s.l. It moved away across hills of west Uttar Pradesh on 27 A trough in the lower levels from this system to north interior Karnataka was observed on 24 and to Madhya Maharashtra on 25 and became less marked on 26
(C) *Induced cyclonic circulations*						
1.	Lower levels	1-3	Northwest Rajasthan	Quasi-stationary	North Rajasthan	

TABLE 2 (*Contd.*)

(1)	(2)	(3)	(4)	(5)	(6)	(7)
(D) *Other cyclonic circulations*						
1.	Lower levels	3-4	West Madhya Pradesh	Stationary	*In situ*	A trough from this system to north interior Karnataka was observed on 4
2.	Lower tropospheric levels	6-8	Sub-Himalayan West Bengal & Sikkim	Southeasterly	Nagaland, Manipur, Mizoram & Tripura and adjoining Myanmar	
3.	Lower levels	6-8	Sub-Himalayan West Bengal and Sikkim and neighbourhood	Quasi-stationary	Sub-Himalayan West Bengal & Sikkim and adjoining Bihar Plains	
4.	Do	7-9	South Madhya Maharashtra and neighbourhood	Northeasterly	Southeast Madhya Pradesh and adjoining Vidarbha and Telangana	A trough from this system was observed from southeast Madhya Pradesh to south Konkan & Goa across West Bengal and Sikkim and adjoining Bihar Plains on 8 and from Bihar Plains to south Konkan & Goa on 8. It became less marked on 9
5.	Mid tropospheric levels	9-14	East-central Arabian Sea off Konkan & Goa coast	Quasi-stationary	Off north Karnataka-Konkan & Goa coasts	
6.	Do	13-16	West-central and adjoining southwest Bay off Andhra-north Tamil Nadu coasts	Stationary	*In situ*	
(E) *Troughs in the easterlies*						
1.	Lower tropospheric levels	4-6	Madhya Maharashtra to Lakshadweep area	Quasi-stationary	North Madhya Maharashtra to south Kerala	
2.	Lower levels	23-24	Telangana to south Kerala coast	Stationary	*In situ*	
(F) *Trough in westerlies*						
1.	Mid and upper tropospheric levels	14-15	Long. 68°N north of Lat. 25°E	Do	*In situ*	
2.	Do	16-23	Southwest Uttar Pradesh to north interior Karnataka	Easterly	Southeast Madhya Pradesh to south Tamil Nadu	
(G) *East-West trough*						
1.	Lower tropospheric levels	28-29	Bihar Plains to northeast Assam	Stationary	*In situ*	
(H) *Other troughs*						
1.	Lower tropospheric levels	27 Feb-1 Mar	Southeast Madhya Pradesh to south Tamil Nadu	Do	*In situ*	

TABLE 3

Rainfall figures (mm) for each month and season as a whole (January-February 1998)

S. No.	Meteorological sub-division	January			February			Winter Season		
		Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)	Actual (mm)	Normal (mm)	Dep. (%)
1.	A&N Islands	21	73	-71	8	48	-84	29	120	-76
2.	Arunachal Pradesh	29	41	-28	82	78	4	111	119	-7
3.	Assam & Meghalaya	11	21	-49	32	30	5	42	51	-17
4.	Naga., Mani., Mizo. & Tripura	29	17	73	25	24	8	54	40	35
5.	SHWB & Sikkim	3	17	-80	16	23	-32	19	40	-52
6.	Gangetic West Bengal	57	14	313	33	23	42	89	37	144
7.	Orissa	34	12	183	31	25	25	66	37	77
8.	Bihar Plateau	61	20	213	24	24	-1	85	44	95
9.	Bihar Plains	7	15	-56	8	16	-54	14	32	-55
10.	East Uttar Pradesh	10	18	-42	11	16	-28	22	34	-35
11.	Plains of west Uttar Pradesh	4	22	-79	9	18	-51	13	40	-67
12.	Hills of west Uttar Pradesh	6	67	-91	68	63	7	74	131	-43
13.	Haryana, Chandigarh & Delhi	1	22	-95	29	19	51	31	41	-26
14.	Punjab	1	29	-97	70	26	167	71	55	29
15.	Himachal Pradesh	14	80	-83	136	74	84	149	154	-3
16.	Jammu & Kashmir	63	79	-20	199	103	94	263	182	44
17.	West Rajasthan	0	4	-99	8	5	73	8	9	-6
18.	East Rajasthan	0	7	-99	1	5	-70	1	11	-87
19.	West Madhya Pradesh	4	13	-71	1	8	-86	5	21	-76
20.	East Madhya Pradesh	39	20	95	10	22	-63	49	42	18
21.	Gujarat Region	0	2	-100	0	1	-84	0	3	-94
22.	Saurashtra, Kutch & Diu	0	1	-100	0	1	-37	0	2	-77
23.	Konkan & Goa	0	1	-100	0	1	-95	0	2	-98
24.	Madhya Maharashtra	1	4	-85	0	1	-100	1	6	-89
25.	Marathwada	0	3	-100	0	3	-87	0	6	-93
26.	Vidarbha	18	11	-58	18	13	46	36	24	52
27.	Coastal Andhra Pradesh	5	10	-45	28	11	159	33	20	64
28.	Telangana	0	4	-91	13	6	96	13	11	20
29.	Rayalaseema	0	8	-100	0	5	-96	0	12	-99
30.	Tamil Nadu & Pondycherry	4	34	-87	1	15	-94	5	49	-89
31.	Coastal Karnataka	0	2	-100	0	1	-100	0	4	-100
32.	N.I. Karnataka	0	3	-100	0	3	-100	0	5	-100
33.	S.I. Karnataka	0	3	-97	0	4	-99	0	7	-99
34.	Kerala	9	14	-39	1	17	-91	10	31	-67
35.	Lakshadweep	52	25	105	0	9	-100	52	35	50

4.2. *Month's rainfall*

Accumulated monthly rainfall was excess in 7, deficient in 7 and scanty in 14 meteorological sub-divisions. There was no rain in remaining 7 meteorological sub-divisions.

Monthly rainfall was excess in Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar Plateau, east Madhya Pradesh, Vidarbha and Lakshadweep; deficient in Arunachal Pradesh, Assam & Meghalaya, Bihar plains, east Uttar Pradesh, Jammu & Kashmir, coastal Andhra Pradesh and Kerala and scanty in Andaman & Nicobar Islands, Sub-Himalayan West Bengal & Sikkim, west Uttar Pradesh, Haryana, Punjab, Himachal Pradesh, Rajasthan, west Madhya Pradesh, Madhya Maharashtra, Telangana, Tamil Nadu and south interior Karnataka. Principal amounts of rainfall for the month of January are given in Table 4.

4.3. *Temperature*

Severe cold wave conditions prevailed on 3 days in west Madhya Pradesh. Cold wave conditions also prevailed on 7 to 8 days in plains of west Uttar Pradesh and Punjab; on 4 to 5 days in Bihar Plains, east Uttar Pradesh, Haryana and west Madhya Pradesh and on 1 to 3 days in Himachal Pradesh, east Rajasthan, east Madhya Pradesh, Saurashtra & Kutch, Marathwada and Vidarbha. Night temperatures were appreciably below normal on 1 or 3 days in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, east Madhya Pradesh and Gujarat Region. They were markedly above normal by

TABLE 4

Principal amounts of rainfall (cm) for the month of January and February 1998

Date	January	February
1	Vedaranyam 3, Kondul & Pamban 2 each	Kupwara 2, Mohana & Pahalgam 1 each
2	Pamban 4, Nancowry & Tondi 3 each, Indore 1	Kupwara, Rohtak & Amritsar 1 each
3	Betul & Amrawara 2 each, Kakinada 1	Nagpur 3, Chindwara, Rajnandgaon & Arjunimorgaon 2 each, Betul, Bhiwapur & Narkhed 1 each
4	Kondul 2, Machilipatnam 1	Dibrugarh 4, Madhabarida 2
5	Nil	Calcutta 2, Dibrugarh 1
6	Nil	Kakinada, Kalingapatnam & Visakhapatnam 2 each
7	Pahalgam, Srinagar & Kupwara 1 each	Gopalpur & Nagpur 2 each, Puri, Raipur, Kalingapatnam & Ramagundam 1 each
8	Nil	Gopalpur, Jagdalpur, Visakhapatnam & Kakinada 2 each, Puri 1
9	Nil	Ongole & Kakinada 1 each
10	Nil	Nancowry, Ongole & Kavali 1 each
11	Nil	Nil
12	Nil	Nil
13	Dibrugarh & Bhuntar 1 each	Nil
14	Tezpur & Bharmour 1 each	Nil
15	Quazi Gund & Batote 4 each, Srinagar & Jammu 1 each	Batote 10, Bhuntar 5, Guler 4, Kathua 3, Mukerian & Jammu 2 each, Srinagar 1
16	Bhuntar 2, Dibrugarh & Batote 1 each	Bangana 4, Ghamrur & Batote 3 each, Mukerian & Srinagar 1 each
17	Nil	Tadong 3, Batala, Batote & Srinagar 2 each, Gangtok, Fatehpur, Bangana & Jammu 1 each
18	Jharsuguda 2, Calcutta, Bhubaneswar & Minicoy 1 each	Srinagar 3, Silchar, Kahu & Jammu 2 each, Dibrugarh, Imphal, Agartala, Nangal Dam, Dharamsala, Tondi Konni & Agartala 1 each
19	Minicoy 7, Contai 3	Batote 8, Banihal 7, Dharamsala & Srinagar 5 each, Passighat, Jogindernagar & Pahalgam 4 each, Bhuntar 3, Mukerian & Jammu 2 each, Dibrugarh, Tezpur, Guwahati, Ranchi & Jagadhari 1 each
20	Konni 5, Rajnandgaon 3, Raigarh 1	Gangtok 3, Dibrugarh & Tadong 2 each, Deragopipur 1
21	Shantiniketan 6, Purulia & Krishnanagar 5 each, Ranchi & Jamshedpur 4 each, Pendra 3, Agartala, Jharsuguda & Chengannur 1 each	Nil
22	Agartala, Bashirhat & Sandheads 2 each, Silchar, Puri & Jamshedpur 1 each	Car Nicobar 2, Kondul, Cuttack, Gopalpur & Kalingapatnam 1 each
23	Nil	Visakhapatnam 28, Puri 3, Jamshedpur 1
24	Vaikom 7, Kumarakom 6, Alapuzha & Cherthala 5 each, Mancompu 3, Visakhapatnam & Kozha 2 each, Minicoy 1	Dharamsala 3, Ludhiana, Jogindernagar, Jammu, Ganganagar & Visakhapatnam 2 each, Bhubaneswar, Amritsar, Srinagar, Jaisalmer & Barmer 1 each
25	Visakhapatnam 3, Minicoy 2	Deragopipur 13, Udhampur 11, Kathua 10, Dharamsala 8, Jamshedpur 7, Ludhiana 6, Shimla & Jammu 5 each, Jagadhari 4, Purulia, Patna, Dehra Dun, Hissar, Chandigarh, Gurudaspur & Srinagar 3 each, Lucknow 2, New Delhi, Amritsar, Sikar & Jabalpur 1 each
26	Pendra 4, Mandi 1	Nagrota & Surian 9 each, Guhla & Balachaur 5 each, Calcutta & Dimond Harbour 4 each, Dehra Dun 3, Jamshedpur, Bhagalpur, Malkapur, Raigarh & Shimla 2 each, Silchar, Ranchi, Chandigarh & Dharamsala 1 each
27	Jharsuguda 5, Hazaribagh 3, Jamshedpur & Pendra 2 each, Purulia & Pamban 1 each	Cuttack & Balasore 3 each, Imphal 2, Dibrugarh & Berhampur 1 each
28	Jamshedpur 4 Nagpur 2, Patna 1	Nil
29	Pendra 6, Samudrapur 5, Jamsolaghat 4, Mana, Lakhandur 3 each, Lucknow, Mharsuguda, Raipur, Katangi & Daltonganj 2 each	
30	Bemetara 4, Gondia 3, Amgaon 2, Umaria, Deoli, Jamshedpur & Gorakhpur 1 each	
31	Kupwara 1	

5° to 7°C on 3 to 4 days in Nagaland, Manipur, Mizoram & Tripura, Orissa, Jammu & Kashmir and Rajasthan and on 1 to 2 days in Bihar Plains, east Uttar Pradesh, Himachal Pradesh and Madhya Pradesh and were generally appreciably above normal over the rest of the country.

Among plain stations the lowest minimum temperature of -1° C was recorded at Amritsar on 1 January, while among the hill stations the lowest minimum temperature of -9°C was recorded at Manali on 16 January.

4.4. *Disastrous weather events and damages*

According to press reports, 40 persons in Bihar and 8 persons in West Bengal died due to cold wave during second week of January.

5. February

5.1. *Weather and associated synoptic features*

6 western disturbances, 3 induced low pressure areas, 7 cyclonic circulations (including 1 induced cyclonic circulation) and 6 troughs affected the India during the month. Due to the continuous presence of western disturbances, Jammu & Kashmir experienced heavy snowfall during the month. Details of these systems are given in Table 2.

Rain or snow occurred either at most places or at many places on 7 days each in Himachal Pradesh and Jammu & Kashmir. Rain or thundershowers occurred either at most places or at many places on 3 to 4 days in Haryana and Punjab and on 1 to 2 days in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar, west Rajasthan and Vidarbha. Very heavy rain also occurred at isolated places on 1 to 3 days in Bihar plateau, Himachal Pradesh, Jammu & Kashmir and coastal Andhra Pradesh. Snowfall reported on 3 days in Jammu & Kashmir and on 1 day in hills of west Uttar Pradesh.

5.2. *Month's rainfall*

Accumulated monthly rainfall was excess in 10, normal in 5, deficient in 6 and scanty in 10 meteorological sub-divisions. There was no rain in 4 meteorological sub-divisions. Monthly rainfall was excess in Gangetic West Bengal, Orissa, Haryana, Punjab, Himachal Pradesh, Jammu & Kashmir, west Rajasthan, Vidarbha, coastal Andhra Pradesh and Telangana; normal in Arunachal Pradesh, Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Bihar plateau and Hills of west Uttar Pradesh. It was deficient in Sub-Himalayan West Bengal & Sikkim, Bihar plains, Plains of Uttar Pradesh, east Madhya Pradesh and Saurashtra & Kutch. It was scanty over the rest of the meteorological sub-divisions outside Madhya Maharashtra, coastal & north interior Karnataka and Lakshadweep where there was no rain. Principal amounts of rainfall for the month of February are given in Table 4.

5.3. *Temperature*

Cold wave conditions also prevailed on 5 days in Punjab and on 1 to 2 days in west Uttar Pradesh, Haryana, Himachal Pradesh, west Rajasthan, Gujarat State, Marathwada and Vidarbha. Night temperatures were appreciably below normal on 3 to 5 days in Bihar Plains, Punjab, west Madhya Pradesh, Gujarat Region, coastal & north interior Karnataka and on 1 to 2 days in Nagaland, Manipur, Mizoram & Tripura, Sub-Himalayan West Bengal & Sikkim, Bihar plateau, Himachal Pradesh, west Rajasthan, Saurashtra & Kutch, Maharashtra & Goa States and Telangana. They were markedly above normal by 5° to 7° C on 3 to 5 days in Orissa, east Rajasthan, east Madhya Pradesh and coastal Andhra Pradesh.

Among the plain stations the lowest minimum temperature of 2°C was recorded at Amritsar on 7 February, while among the hill stations the lowest minimum temperature of -6°C was recorded at Kalpa on 3 February and at Manali on 6 & 8 February.

5.4. *Disastrous weather events and damages*

According to press reports, 3 people died due to thundersquall/thunderbolt on 4 February and 10 people lost their lives due to hailstorm/squall on 25 February in West Bengal.