

Weather

WINTER SEASON (JANUARY & FEBRUARY 1986)*

1. Chief features

- (i) Formation of a depression over southwest Bay during January (Track is given in Inset of Fig.1).
- (ii) Cold wave conditions in some places of Bihar, east Uttar Pradesh and Madhya Pradesh during the first week of January, which took a toll of considerable number of lives.
- (iii) Seasonal rainfall (Fig. 1) was in large excess in east Rajasthan, Madhya Pradesh, Madhya Maharashtra, Vidarbha, Andhra Pradesh, Tamil Nadu and interior Karnataka; moderately excess in Orissa and plains of Uttar Pradesh and slightly excess in Marathwada and Kerala. It was normal in Haryana; slightly deficient in Punjab and moderately deficient in Bihar Plateau, Jammu & Kashmir and west Rajasthan. It was largely deficient in the rest of the country outside Gujarat State and Konkan & Goa where there was no rain.

2. January

Winter was chilly over central India and Bihar & Orissa during the first week of the month.

2.1. Synoptic features and associated weather

Last month's western disturbance over north Pakistan and neighbourhood moved away eastwards across Western Himalayas on 3rd.

Eight more western disturbances affected Western Himalayas and neighbourhood during the month.

The other synoptic features observed during the month are given in Table 1.

In association with these synoptic features snowfall was widespread on 23rd and scattered or isolated on 12th, 28th and 30th in Jammu & Kashmir. Isolated snowfall also occurred on 30th in Himachal Pradesh. Generally widespread rainfall occurred on two to four days in Andhra Pradesh, Tamil Nadu and south interior Karnataka between 12th and 16th, it was so on one day each in Assam & Meghalaya, Nagaland, Manipur, Mizoram & Tripura, Gangetic West Bengal, Orissa, Bihar Plateau

east Madhya Pradesh, Marathwada, Vidarbha and north interior Karnataka during the same period. Generally widespread rainfall also occurred on 28th in west Madhya Pradesh, on 29th in Haryana and on 31st in Arunachal Pradesh. Andaman Nicobar Islands received scattered or isolated rainfall on seven days upto 11th and thereafter only on 25th. Rainfall was scattered or isolated on a few days over the rest of the country outside Sub-Himalayan West Bengal & Sikkim, Gujarat State, Konkan & Goa and coastal Karnataka where the weather was mainly dry.

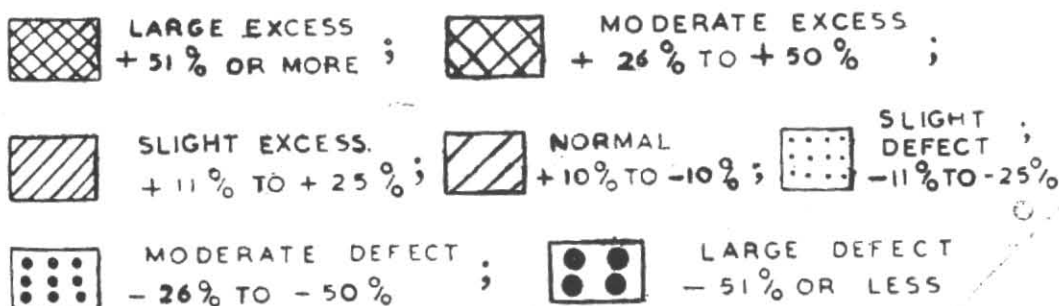
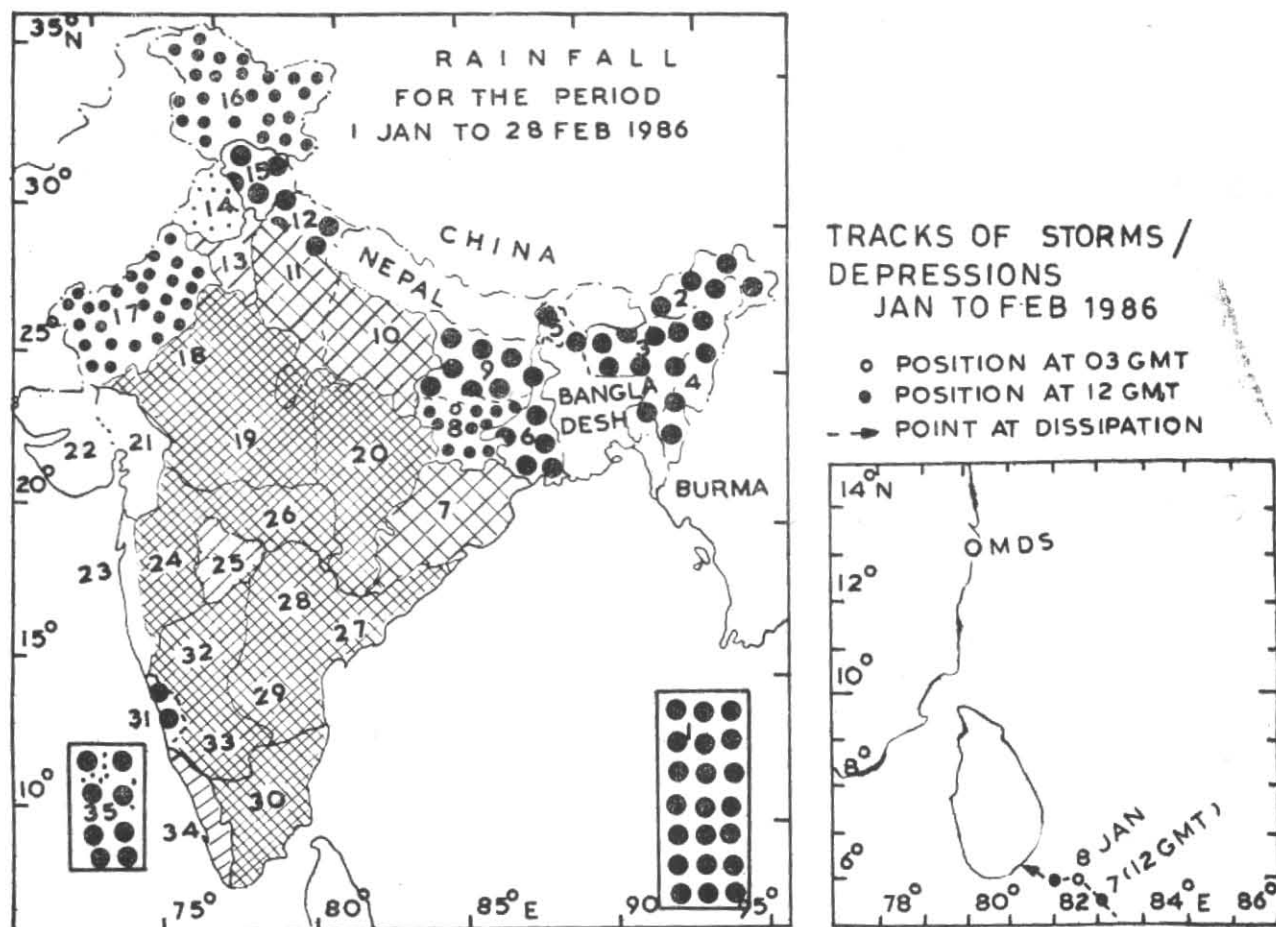
2.2. Rainfall during the month

Rainfall was excess in Orissa, Madhya Maharashtra, Marathwada, Andhra Pradesh, Tamil Nadu and interior Karnataka; normal in Madhya Pradesh and Vidarbha; deficient in Gangetic West Bengal, Bihar Plateau, plains of Uttar Pradesh and east Rajasthan. It was scanty over the rest of the country outside Gujarat State and Konkan & Goa where there was no rain.

Significant amounts (cm) of rainfall were :

- 7th Kondul 4.
- 10th Vedaranyam 5, Adirampattinam 3.
- 11th Vedaranyam 5, Adirampattinam & Nagapattinam 3 each.
- 12th Nagapattinam 15, Vedaranyam 14, Karaikal 12, Kalpa 8, Adirampattinam 6, Pondicherry 5, Trivandrum AP & Cuddalore 4 each.
- 13th Madras (AP and city both) & Sullurpet 7 each, Pondicherry 4, Cuddalore & Parangipettai 3 each.
- 14th Sullurpet 15, Nellore 11, Tirupati AP 8, Kallakurichchi 7, Vellore 6, Madras AP 5.
- 15th Atmakur 17, Nellore 11, Sangareddy 7, Sullurpet, Mysore & Coonoor 5 each, Billoli, Nizamabad, Thanjavur & Peermedu 4 each.
- 16th Chidambaram 7, Ongole & Arogyavarm 6 each; Swampatna & Pakala 5 each; Balasore, Titlagarh, Cuttack, Keonjhar & Bapla 4 each.
- 27th Shivpuri 3.
- 29th Karnal 8, Delhi & Gurgaon 3 each.
- 30th Orai 3.

*Prepared by S/Shri Nootan Das, M. R. M. Rao, N. C. Biswas, Meteorological Office, Pune



Sub-division	Dep. from normal	Sub-division	Dep. from normal
1. A & N Islands	-76	18. East Rajasthan	152
2. Arunachal Pradesh	-68	19. West M.P.	251
3. Assam & Megha.	-72	20. East M.P.	71
4. N. M. M. & T.	-63	21. Gujarat Region	-100
5. S. H. W. B. Sikkim	-69	22. S & K	-100
6. G. West Bengal	-54	23. Konkan & Goa	-100
7. Orissa	50	24. Madhya Maha	149
8. Bihar Plateau	-37	25. Marathwada	18
9. Bihar Plains	-67	26. Vidarbha	190
10. East U.P.	31	27. Coastal A.P.	383
11. Plains W. U.P.	28	28. Telangana	492
12. Hills W. U.P.	-69	29. Rayalaseema	243
13. Haryana	-3	30. Tamil Nadu	135
14. Punjab	-14	31. Cot. Karnataka	-82
15. Himachal Pradesh	-54	32. N. I. Karnataka	264
16. Jammu & Kashmir	-49	33. S. I. Karnataka	142
17. West Rajasthan	-29	34. Kerala	11
		35. Lakshadweep	-53

Fig. 1. Rainfall and its departure from normal for the period 1 January to 28 February 1986 (Inset—Track of depression during the period)

TABLE 1
Synoptic features observed during January 1986

Weather systems	Period (Jan '86)	Place of first location	Track followed	Place of dissipation	Special remarks
(a) Systems in westerlies					
1. Induced cyclonic circulations					
(i) (In lower trop. levels)	7th-10th	Haryana and Punjab	—	Over Haryana and adjoining Punjab	
(ii) Do.	10th evening to 14th	West Rajasthan & neighbourhood	Easterly	Over plains of west Uttar Pradesh and neighbourhood	
(iii) Do.	27th-28th	Haryana and adjoining Rajasthan	Northerly	It merged with the western disturbance over Jammu & Kashmir and adjoining Punjab and neighbourhood	
(iv) Do.	25th-27th	Haryana	Easterly	West Uttar Pradesh	A trough at 0.9 km extended to Vidarbha on 26th
(v) Do.	28th-31st	South Rajasthan and adjoining Gujarat region and west Madhya Pradesh	Do.	Over east Uttar Pradesh and adjoining Bihar plains	
2. Cyclonic circulations					
Lower tropospheric levels	18th-22nd	Gujarat State and neighbourhood	Northerly	Merged with the western disturbance over Punjab and Jammu & Kashmir	A trough at 0.9 km a. s. l. extended southwards to Rayalaseema on 20th
3. Trough in westerlies					
(i) Middle and upper tropospheric levels	3rd-5th	Extended roughly along 70°E north of 25°N	Easterly	Over west Uttar Pradesh east Rajasthan and Gujarat region.	
(ii) Do.	7th-8th	Extended from Jammu & Kashmir to northeast Arabian Sea	Northeasterly	Moved away across Tibet	
(iii) Do.	14th-16th	Extended across Afganistan and south Pakistan	Easterly	West Uttar Pradesh and neighbourhood	
(b) Systems in easterlies					
1. Depression	7th evening to 14th	Southwest Bay off Sri Lanka coast	Westerly	Sri Lanka and neighbourhood	
2. Low pressure area	15th-16th	Lakshadweep and adjoining south-east Arabian Sea	Northerly	East central Arabian Sea off Maharashtra coast	Appeared first as cyclonic circulation in lower troposphere over the same area on 13th
3. Do.	15th-18th	Southwest Bay and adjoining Sri Lanka	Do.	South and adjoining west central Bay	Appeared on 13th as a cyclonic circulation extending upto midtropospheric levels over southwest Bay and adjoining south Tamil Nadu and Sri Lanka

TABLE 2

Synoptic features observed during February 1986

Weather system	Period (Feb '86)	Place of first location	Track followed	Place of dissipation	Special remarks
(a) Systems in westerlies					
1. Cyclonic circulation					
(i) Lower tropospheric level	3rd-7th	Central Pakistan and adjoining Rajasthan	Eastnorth-easterly	Himachal Pradesh and adjoining hills of west Uttar Pradesh	
(ii) Lower and middle tropospheric levels	7th evening to 12th	Central Pakistan and adjoining Afganistan	Easterly	Punjab and neighbourhood	Under its influence a low pressure area developed over north Rajasthan and adjoining Punjab and Haryana on 10th
(ii) Lower tropospheric levels	7th evening to 9th	Saurashtra & Kutch and adjoining northeast Arabian Sea	Northerly	North Rajasthan and neighbourhood where it merged with the circulation (ii) above	
(iv) Lower levels	20th to 22nd	Gujarat region and adjoining Rajasthan and west Madhya Pradesh	Northnorth-easterly	West Uttar Pradesh	
(v) Lower levels	24th evening to 26th	North Konkan and adjoining-Madhya Maharashtra and south Gujarat region	Easterly	Madhya Maharashtra and adjoining Marathwada and Vidarbha	
(vi) Lower tropospheric levels	27th and 28th	Sub-Himalayan West Bengal & Sikkim	—	<i>in situ</i>	
2. Induced cyclonic circulation extending upto 1.5 km a.s.l.	17th-18th	Central Pakistan and adjoining Rajasthan	Northerly	Merged with the western disturbance over Jammu & Kashmir	
3. Low pressure area with associated cyclonic circulation extending upto lower tropospheric levels	11th-15th	South Pakistan	Easterly	East Rajasthan and adjoining northwest Madhya Pradesh	The low pressure area became less marked on 13th over Pakistan
4. Trough in westerlies					
(i) Mid and upper tropospheric levels	5th-7th evening	Extending from Jammu & Kashmir to northeast Arabian Sea	North-easterly	Moved away across northwest India	
(ii) Do.	8th-11th	Extending from Russian-Turkistan to west Rajasthan	Easterly	Northwest and adjoining central India	
(b) Systems in easterlies					
Cyclonic circulation in lower levels	19th-20th	Sri Lanka and neighbourhood	—	<i>in situ</i>	

2.3. Temperature

Moderate cold wave conditions prevailed on one to four days at a few places in Orissa, Bihar, east Uttar Pradesh and Madhya Pradesh during the first week of the month. Chilly winds swept over plains of Bihar and Uttar Pradesh during the same period. Day temperatures were as much as 6°C to 10°C below normal on two to three days at several places of these sub-divisions. Night temperatures were also below normal over northwest India, Gujarat State, Maharashtra State and Telangana during the first fortnight, being appreciably so on several days in Punjab, Jammu & Kashmir, Rajasthan and Vidarbha.

They were generally above normal, being appreciably so, on a few days in Madhya Pradesh, Gujarat State, Maharashtra State and Andhra Pradesh during the second fortnight of the month.

As per press reports a portion of the Dal Lake in Kashmir valley was frozen in the first week. Also the cold wave and chilly winds claimed, during the same period, about 103 lives in Bihar, Uttar Pradesh and Jammu.

3. February

3.1. Synoptic features and associated weather

During the month there were three spells of snowfall over Jammu & Kashmir and Himachal Pradesh.

Eight western disturbances moved away across Western Himalayas. The ninth western disturbance was located over north Pakistan on 28th.

Other synoptic features observed are given in Table 2.

Wind discontinuity/trough at 0.9 km a.s.l. over Peninsula was observed on many days from 13th onwards.

There were three spells of snowfall over Himachal Pradesh and Jammu & Kashmir; first one on 4th, second from 10th to 15th and the third from 18th to 23rd. Snowfall over these areas was generally widespread on four to five days. It was scattered or isolated over Himachal Pradesh on five days.

Rainfall was generally widespread on 1st and 6th in Arunachal Pradesh, on 10th in Rajasthan and west Madhya Pradesh and on 12th in Bihar Plateau and Vidarbha. Generally widespread rainfall also occurred on two to three days in Orissa, Bihar plains, Uttar Pradesh, Haryana, Punjab, Jammu & Kashmir, east Madhya Pradesh and Telangana during the period from 10th to 15th. Punjab and Jammu & Kashmir experienced widespread rainfall again on 21st and 22nd. Scattered or isolated rainfall occurred on 13 to 14 days in Madhya Pradesh, Vidarbha, Tamil Nadu and in other sub-divisions on two to seven days outside Gujarat State, Konkan & Goa and coastal Karnataka where weather was mainly dry.

3.2. Rainfall during the month

It was excess in Orissa, plains of Uttar Pradesh, Haryana, Punjab, Rajasthan, Madhya Pradesh, Madhya

Maharashtra, Vidarbha, coastal Andhra Pradesh, Telangana, Tamil Nadu, interior Karnataka and Kerala; normal in Arunachal Pradesh, Himachal Pradesh, Marathwada, Rayalaseema and Lakshadweep; deficient in Sub-Himalayan West Bengal & Sikkim, Bihar and Jammu & Kashmir and scanty over the rest of the country outside Gujarat State, Konkan & Goa and coastal Karnataka where there was no rain.

Significant amounts (cm) of rainfall were :

- 6th Mungeli 3.
- 7th Balaghat & Mungeli 4 each.
- 8th Amraoti 5, Shajapur & Betul 4 each.
- 9th Shivapuri & Datia 3 each.
- 10th Guna, Seoni & Kota AP 6 each; Jabalpur, Hardoi & Datia 5 each, Gwalior, Bhopal, Bareilly AP & Satna 4 each, Delhi, Amritsar AP & Lucknow AP 3 each.
- 11th Narwana 18, Moradabad, Dehradun & Nahan 6 each, Sarsawa AP, Rewa, Jogindernagar & Sherthela 5 each, Udahapur AP, Dharampur, Jammu city, Batote & Katra 4 each.
- 12th Phulbani 5.
- 13th Kalpa 8, Nizamabad 6, Ramagundam 4, Batote, Jogindernagar & Raichur 3 each.
- 14th Coonoor 4, Varanasi AP, Bhuntar AP & Panna 3 each.
- 15th Datia & Tuticorin 4 each, Balasore, Gondia, Hoshangabad, Kalingapatnam & Cochin AP 3 each.
- 16th Karikal 6, Machailipatnam 5, Aijal, Visakahpatnam & Rentachintala 3 each.
- 17th Machilipatnam 5.
- 18th Bapatla 7, Poonch & Ariyalur 5 each, Gulmarg 4, Dharampur, Quazigund, Batote, Katra & Pargipetta 3 each.
- 19th Tamkaram 16, Madras AP 4, Tumkur 3.
- 20th Coimbatore 6, Coonoor 5, Bangalore AP 4, Jalgaon & Cochin AP 3 each.
- 21th Dhuri 7, Coonoor 4, Katra, Kottayam & Yeotmal 3 each.
- 22th Katra 6, Sangla 5, Dharmasala & Badarwah 4 each, Nurpur & Baijnath 3 each.
- 23th Manali 4, Bolepur 3.
- 25th Edalabad 4, Akola & Pamban 3 each.
- 26th Cochin AP 6, Palayankottai 4, Tuticorin 3.
- 27th Seoni 3.

3.3. *Hailstorm and damages*

During the first fortnight of the month hailstorms were reported from different parts of the country. In Maharashtra State, hailstorms occurred at a few places in Nagpur, Bhandara, Chandrapur, Wardha, Amraoti, Akola and Yeotmal districts of Vidarbha between 7th and 14th. It also affected 229 villages in Jalgaon, Dhule, Nanded and Parbhani dists. of Madhya Maharashtra and Marathwada between 7th and 13th. Two persons were reported to have been killed and 10 were injured. Damages to crops and other properties were estimated to about Rs. 205 lakhs in these four districts. In Uttar-Pradesh hailstorms affected 383 villages in Lalitpur district and 25 villages in Mainpuri district between 9th & 13th and also 26 villages in Mathura district on 19th. Hailstorms were also reported from Chittorgarh and

Jhalawar districts of Rajasthan on 9th, from Atmakur of Warangal district of Telangana on 10th and from Gulbarga of north interior Karnataka on 12th.

3.4. *Temperature*

Moderate cold wave condition prevailed at a few places in Saurashtra and Kutch on 1st and in Orissa on 20th.

Night temperatures were generally below normal, being appreciably so on a few days, in west Uttar Pradesh, Haryana, Punjab and Himachal Pradesh between 11th and 28th. They were also appreciably below normal in Orissa from 16th to 19th and in Jammu from 13th to 17th.