

# Weather

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## WINTER SEASON (JANUARY & FEBRUARY 1984)\*

### 1. Chief features

1.1. Severe winter over northwest India, Uttar Pradesh, Madhya Pradesh and Gujarat State in the second fortnight of February.

1.2. Unprecedented heavy rainfall in some parts of Tamil Nadu and south coastal Andhra Pradesh in the middle of February which caused considerable damage to crops and property.

1.3. Rainfall for the season (Fig. 1) was in large excess in Madhya Maharashtra, Vidarbha, coastal Andhra Pradesh, Tamil Nadu, Kerala and Lakshadweep; in moderate excess in Andaman & Nicobar Islands and Bihar plains and was in slight excess in east Madhya Pradesh. It was normal in Marathwada and Rayalaseema; slightly deficient in Bihar plateau, east Uttar Pradesh, Punjab and west Madhya Pradesh; moderately deficient in West Bengal & Sikkim, plains of west Uttar Pradesh, Jammu & Kashmir, west Rajasthan and Karnataka and largely deficient over the rest of the country outside Gujarat State where there was no rain.

### 2. January

There was practically no rainfall over northeast India and Uttar Pradesh during the first fortnight of the month. Winter was generally mild over the country except for a few days in some parts.

#### 2.1. Western disturbances and other systems in westerlies

The western disturbance of the last month and eight others affected Western Himalayas during the month. Of these, the western disturbances which moved across western Himalayas and neighbourhood between 4th and 9th and 12th and 24th were active. Besides the western disturbances, six induced systems developed over northwest India and adjoining region of which the following caused precipitation:

(i) An induced low level cyclonic circulation, which developed over northeast Rajasthan on 6th, became less marked over northwest Uttar Pradesh on 9th.

(ii) A cyclonic circulation, which developed over Saurashtra & Kutch on 14th, moved across Rajasthan and west Uttar Pradesh and became less marked over east Uttar Pradesh and adjoining Bihar plains on 16th.

(iii) During the month a trough in middle and upper tropospheric westerlies moved across north India between 1st and 3rd. Two more troughs in these levels affected northwest and central India, one between 6th and 9th and the other between 13th and 14th.

(iii) Besides these, (1) the last month's cyclonic circulation in the lower troposphere off north Maharashtra coast was seen as a low pressure area over southwest Madhya Pradesh and neighbourhood on 2nd which became less marked there by next day, (2) Also, a cyclonic circulation upto 0.9 km a.s.l. was seen over Vidarbha on 6th, (3) a low level cyclonic circulation developed over Madhya Pradesh on 22nd where a low pressure area formed on 23rd. It became less marked over Gangetic West Bengal and Bangla Desh on 24th & (4) A low level cyclonic circulation/trough formed over west Madhya Pradesh on 26th. It became less marked over east Madhya Pradesh and adjoining Vidarbha on 29th. Three cyclonic circulations/troughs in the low level westerlies affected the northeastern part of India: (1) One moved eastwards across Assam and adjacent States between last day of December and 3 January, (2) the other one persisted on many days over sub-mountane Bihar and adjoining Sub-Himalayan West Bengal between 19th and 25th and (3) the third one moved across Gangetic West Bengal & adjoining north Orissa and Assam & adjacent States between 26th and 30th.

Consequent to these systems rain or snow was generally widespread on 6th in Himachal Pradesh, on 6th and 13th in Jammu & Kashmir and on 16th in hills of west Uttar Pradesh. It was scattered or isolated on 17th and 23rd in Himachal Pradesh, on 16th, 17th, 19th and 23rd in Jammu & Kashmir. Rain or thunder-showers were generally widespread on one to two days in Madhya Pradesh and Vidarbha in the first week, in Assam and Meghalaya, Sub-Himalayan West Bengal & Sikkim, Bihar State and plains of Uttar Pradesh in the third week and so in Gangetic West Bengal on 23rd. They were scattered or isolated on 7 to 12 days in Madhya Pradesh and Vidarbha, on 4 to 6 days in Assam & Meghalaya, Gangetic West Bengal, Orissa, and Bihar plateau and on 1 to 3 days in the rest of northeast India, plains of Uttar Pradesh and northwest India outside west Rajasthan where there was no rain during the month.

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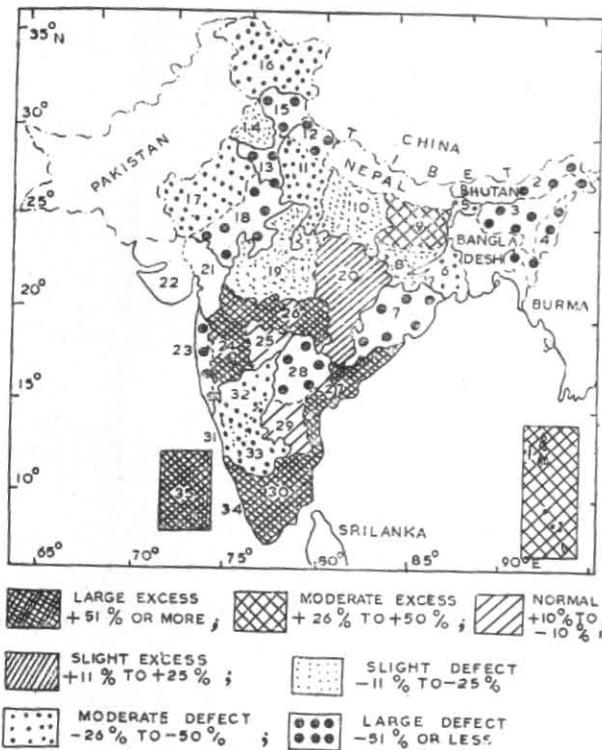


Fig. 1. Percentage departure of rainfall from normal for the period 1 January to 29 February 1954

Sub-division	Dep. from normal	Sub-division	Dep. from normal
1. A. & N. Islands	31	18. East Rajasthan	-85
2. Arunachal	-57	19. West M.P.	-11
3. Assam & Megh.	-66	20. East M.P.	19
4. N.M.M. & T.	-89	21. Gujarat Reg.	-100
5. S.H.W.B. Sikkim	-34	22. S & K	-100
6. G. West Bengal	-46	23. Konkan & Goa	-78
7. Orissa	-73	24. Madhya Maharashtra	82
8. Bihar Plateau	-15	25. Marathwada	-1
9. Bihar Plains	29	26. Vidarbha	61
10. East U.P.	-23	27. Coastal A.P.	99
11. Plains West U.P.	-38	28. Telangana	-64
12. Hills West U.P.	-61	29. Rayalaseema	3
13. Haryana	-61	30. Tamil Nadu	203
14. Punjab	-19	31. Coast Karnataka	-47
15. Himachal Pradesh	-74	32. N.I. Karnataka	-48
16. Jammu & Kashmir	-50	33. S.I. Karnataka	-27
17. West Rajasthan	-50	34. Kerala	160
		35. Lakshadweep	106

## 2.2. Systems in easterlies

The weather over Peninsular India, Andaman & Nicobar Islands and Lakshadweep were affected by the following systems :

(i) The low pressure area which lay over southeast Arabian Sea off Kerala-Karnataka coasts persisted there till 3rd and then moved away westwards.

(ii) A cyclonic circulation in the low levels developed over southwest Bay off Sri Lanka coast on 1st. It was seen there as a low pressure area on 4th which became less marked subsequently.

(iii) A trough of low lay over Andaman Sea on 6th. It moved over southeast Bay on 10th, where a low pressure area formed and it slowly moved westwards across southwest Bay and south Peninsula and was

seen as a trough of low over Lakshadweep and neighbourhood on 18th. It became less marked subsequently.

(iv) A cyclonic circulation extending upto 2.1 km a.s.l. was seen over Comorin and adjoining extreme south Peninsula on 18th.

(v) A cyclonic circulation developed over south Sri Lanka and adjoining Comorin on 22nd. It persisted there as a cyclonic circulation/trough extending upto 1.5 km a.s.l. till 25th.

(vi) A cyclonic circulation upto 2.1 km a.s.l. lay over extreme south Peninsula and adjoining Comorin Maldives areas on 29th. It moved westwards and was seen as a low pressure area over southeast Arabian Sea west of Lakshadweep and Maldives on 1st of the next month.

(vii) A trough of low lay over Andaman Sea between 24th and 30th.

These systems caused generally widespread rain or thundershowers on one to three days in Tamil Nadu, Kerala, Andaman and Nicobar Islands and Lakshadweep during the month. Scattered or isolated rain or thundershowers occurred on eleven to thirteen days in Tamil Nadu, Kerala and Andaman and Nicobar islands, on three to six days in coastal Andhra Pradesh, Telangana and Lakshadweep and one day each in Madhya Maharashtra, Rayalaseema and south interior Karnataka. Isolated heavy fall occurred in Andaman and Nicobar Islands on 11th, in Tamil Nadu on 16th and in Kerala on 30th.

## 2.3. Rainfall during the month

Rainfall for the month was excess in Andaman & Nicobar Islands, West Bengal & Sikkim, Bihar State, Madhya Pradesh, Vidarbha, Tamil Nadu, Kerala and Lakshadweep; normal in Arunachal Pradesh, east Uttar Pradesh and coastal Andhra Pradesh; deficient in Assam & Meghalaya, Orissa, plains of west Uttar Pradesh and Telangana; scanty over the rest of the country outside west Rajasthan, Gujarat State and north interior Karnataka where there was no rain.

The notable amounts (cm) of rainfall were :

- 4th : Nagapattinam 4;
- 5th : Pamban 4;
- 6th : Gonda 4;
- 7th : Raipur & Bobbili 4 each;
- 9th : Nancowry 6, Durg 4;
- 11th : Kondul 7, Guna 4;
- 12th : Kondul 6;
- 14th : Pamban 5;
- 15th : Vedaranniyam 10, NAS Cochin, Trivandrum AP & Sagar 5 each;
- 16th : Tuticorin 9, Gaya 5;
- 17th : Devikulam 6, Chaibasa & Chaparmukh 5 each;
- 18th : Cannanore & NAS Cochin 4 each;
- 19th : Coonoor 8, Palayankottai 6;
- 20th : Mavelikara 5;
- 21th : NAS Cochin & Sidhi 5 each;

24th : Sidhi 6  
 25th : Mercara 4  
 28th : Pendra 6  
 29th : Mayiladuthurai 5  
 30th : Triyandrum AP 7  
 31st : Amini 6

#### 2.4. Temperature

Moderate cold wave conditions prevailed at a few places in south Rajasthan on 17th, in Madhya Maharashtra on 17th and 21st, in Vidarbha on 18th, in east Uttar Pradesh, Punjab, north Rajasthan and Kutch on 29th and in Jammu & Kashmir and west Madhya Pradesh on 29th and 30th.

Night temperatures were generally below normal in west Uttar Pradesh, northwest India and Gujarat being appreciably so on a couple of days during the month. They were generally above normal, being appreciably so on a few days, in Marathwada, Vidarbha, Andhra Pradesh, Tamil Nadu and interior Karnataka.

### 3. February

The weather in this month is characterised by severe cold wave conditions in several parts of north India and unusual rainfall in Tamil Nadu and coastal Andhra Pradesh.

#### 3.1. Western disturbances and other systems in westerlies

Besides the western disturbance of the last month, which moved away eastwards by 4th, nine western disturbances affected Western Himalayas during the month. The tenth western disturbance of the month lay over Jammu & Kashmir and adjoining north Pakistan on the last day of the month.

Two induced systems developed over northwest India in the second fortnight as given below :

(i) A cyclonic circulation extending upto lower troposphere developed over Rajasthan and neighbourhood on 17th. Under its influence a low pressure was formed over northwest Rajasthan and adjoining Haryana and Punjab on 18th, which became well marked on 19th. It became unimportant over Himachal Pradesh and adjoining hills of west Uttar Pradesh on 21st evening.

(ii) A cyclonic circulation in the lower troposphere developed over Himachal Pradesh and neighbourhood on 26th, which became less marked by 28th.

The other westerly systems which affected central and northeast India were :

(iii) A cyclonic circulation in the lower levels that moved from Bihar plains and neighbourhood to Assam and Meghalaya between 2nd and 6th.

(iv) Another cyclonic circulation in the lower levels moved from central parts of Madhya Pradesh across Bihar to West Bengal between 10th and 12th.

(v) A trough in low level westerlies moved from Bihar plains and neighbourhood to Assam and Meghalaya between 9th and 10th.

(vi) A cyclonic circulation in the lower troposphere which lay over southeast Arabian Sea off Maharashtra-Gujarat coasts from 12th to 14th moved over Saurashtra & Kutch and became less marked there by 16th.

(vii) During the month four troughs in middle and upper tropospheric westerlies affected north or northwest India, the first one between 1st and 2nd, the second one between 6th and 8th, the third one between 11th and 16th and the fourth one between 17th and 18th.

#### 3.2. Systems in easterlies

A number of systems developed in the easterlies of which the followings affected the weather over Peninsula and neighbourhood, Andaman & Nicobar Islands and Lakshadweep :

(i) A trough at 0.9 km a.s.l. extended on 1st from north interior Karnataka to southwest Bay off Sri Lanka coast.

(ii) A trough of low, which lay over southeast Bay on 2nd, moved over southwest Bay on 3rd. By the same evening a well marked low pressure area developed over there off Sri Lanka coast. It slowly moved westwards and became less marked over southeast Arabian Sea on 12th.

(iii) A trough in low level easterlies extended from off Maharashtra coast to Lakshadweep from 13th to 15th.

(iv) A trough of low lay over southwest Bay and another over Andaman Sea from 9th to 15th. The former one continued to persist there till 22nd being well marked on a few days.

(v) Cyclonic circulation in the lower troposphere lay over extreme south Peninsula and adjoining Comorin and neighbourhood from 13th to 22nd.

(vi) A trough of low moved over southwest Bay from Andaman Sea between 24th evening and 28th evening. In this, low pressure area formed over extreme southwest Bay and adjoining north Indian Ocean on 29th.

(vii) A cyclonic circulation upto 2.1 km a.s.l. moved from Comorin and adjoining Peninsula to Lakshadweep areas between 27th and 29th.

(viii) The wind discontinuity at 0.9 km a.s.l. over the Peninsula was seen on five to six days from 12th to 29th.

In association with these system rain or snow was generally widespread on two to three days in Himachal Pradesh and Jammu & Kashmir between 2nd and 5th and on a day in Jammu & Kashmir between 7th and 11th and on one to four days in Western Himalayas between 18th and 21st. It was scattered or isolated on a day during the first spell and three days during the second spell over these areas. There was isolated heavy to very heavy falls on two days each in Himachal Pradesh and Jammu & Kashmir during these spells. The precipitation over northwest India, Uttar Pradesh, Madhya Pradesh, Vidarbha and northeast India generally occurred between 2nd and 4th, 8th and 12th and between 17th and 22nd. Rain or thundershowers were generally widespread on one to three days in



Assam & Meghalaya, Sub-Himalayan West Bengal & Sikkim, Bihar plains, Uttar Pradesh, Haryana, Punjab, Jammu & Kashmir, east Madhya Pradesh and Vidarbha. They were scattered or isolated on five to nine days in Bihar Plateau, east Uttar Pradesh, Madhya Pradesh, Madhya Maharashtra and Marathwada and on one to four days in the remaining sub-divisions of north India outside Gujarat State where there was no rainfall.

In the Peninsula, generally widespread rain or thundershowers occurred on nine days in Tamil Nadu, on four days in Kerala and on one to two days in coastal Andhra Pradesh and Rayalaseema with isolated heavy to very heavy falls on eight days in Tamil Nadu and on one to three days in the other two sub-divisions. Scattered or isolated rain or thundershowers occurred over the whole Peninsula on a number of days. In Andaman and Nicobar Islands they were generally widespread on seven days while in Lakshadweep they were scattered or isolated on nine days.

According to press reports a tornado hit Sonawal (Punjab) on 19th afternoon injuring 25 persons and causing extensive damage to crops and property. Heavy rain from 13th to 17th in Tamil Nadu claimed eight lives in Madras city and caused disruption in communications. Flood and heavy rain claimed 5 lives in Nellore district and 250 cattle heads in Chittoor district. Loss to crops and property in Nellore, Chittoor and Prakasam districts of Andhra Pradesh estimated at about Rs. 23 crores.

Nellore and Vellore recorded rainfall of 16 cm and 11 cm respectively on 14th and Madras city 29 cm and Madras AP 13 cm on 17th. These falls have exceeded the highest rainfall in 24 hours so far recorded for these stations in February which were 12 cm, 7 cm and 12 cm respectively. These amounts were even higher than the wettest monthly totals for February for these stations.

### 3.3. Rainfall during the month

Rainfall was excess in Andaman & Nicobar Islands, Punjab, Madhya Maharashtra, coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, Kerala and Lakshadweep; normal in Bihar plains, Vidarbha, coastal and south interior Karnataka; deficient in Bihar Plateau, Uttar Pradesh, Haryana, Jammu & Kashmir, west Rajasthan, Madhya Pradesh, Marathwada and north interior Karnataka; scanty over the rest of the country outside Gujarat State where there was no rain.

Significant amounts (cm) of rainfall were :

- 1st : Banihal, Batote & Pahalgam 2 each;
- 2nd : Banihal, Batote, Pahalgam & Kondul 2 each;
- 3rd : Pahalgam 7, Quazigund, Batote, Chamba, Ali-garh and Sidhi 5 each;
- 4th : Dahra Dun, Banihal, Quazigund, Udampur & Pamban 4 each;

- 5th : Pamban 8;
- 6th : Karaikal 13, Mannargudi 11, Parangipettai 8, Thanjavur 7;
- 7th : Nagapattinam 7, Karaikal 5, Adirampattinam 4, Akola, Wardha & Buldhana 3 each;
- 8th : Adirampattinam 5, Toradi 4;
- 9th : Port Blair 6, Kondul 4;
- 10th : Long Island 13, Fort Blair 12, Hut Bay 5;
- 11th : Maya Pandar 5;
- 12th : Palayankottai, Cochin AP 5, Tutcorin 4;
- 13th : Coonoor 10, Port Blair 9, Nagapattinam 6, Kaniyakumari and Tiruttani 5 each;
- 14th : Nellore 16, Vellore 11, Tirupati AP 9, Kanchipuram and Thumba 8 each;
- 15th : Dindigul 12;
- 16th : Parangipettai 12, Cuddalore 8, Nagapattinam 7;
- 17th : Madras city 29, Madras AP 13, Sullurpetta 10, Cuddalore 9;
- 18th : Srivilliputtur 13, Kandaghat 8, Madurai city & Parli 6 each;
- 19th : Roorkee 11, Surdernagar 7, Bhuntar 6;
- 20th : Muradabad 5, Gaya 4, Patna & Dehri 3 each;
- 21st : Thodupuza, Mavelikara & Quilon 7 each, Alleppey 5;
- 22nd : Minicoy 6;
- 23rd : Polavaram 5;
- 24th : Nancowry 6;
- 25th : Pamban 6, Tutcorin 5;

### 3.4. Temperature

Moderate cold wave conditions prevailed at a few places in Himachal Pradesh on 5th and in Uttar Pradesh and Rajasthan on 6th. Moderate to severe cold wave swept on most days over northwest India, Gujarat State, Madhya Pradesh and Uttar Pradesh between 21st and 27th; on 1 to 3 days in Bihar State, Vidarbha and Telangana between 25th and 27th and on 21st in north Madhya Maharashtra.

Night temperatures were as much as 10 deg. C to 12 deg. C below normal on one to three days in hills of west Uttar Pradesh, Jammu & Kashmir, Rajasthan and Saurashtra & Kutch during 21st to 24th.

Night temperatures were generally below normal over northwest India, Gujarat, Madhya Pradesh and Uttar Pradesh. They were above normal in Peninsula outside Kerala being appreciably so on a number of days.