

# Weather

## HOT WEATHER SEASON (MARCH-MAY 1971)

### CHIEF FEATURES

#### Western Disturbances

Twentyfour western disturbances moved eastwards across northwest India during this season. On an average, seven to nine western disturbances affected north India in each month. These disturbances induced low pressure areas over Rajasthan, which subsequently moved eastwards across north India. The western disturbances were active in April and May and caused abnormal thunder-shower activity in most parts of north India. Severe thundersqualls, hailstorms and duststorms with persistent rain were reported from Bihar, Uttar Pradesh, Haryana, Punjab and Himachal Pradesh in April and May. This caused considerable damage to rabi crops, particularly, wheat and other fruit crops. Some loss of life was reported from Uttar Pradesh.

#### Cyclonic storms/depressions

A cyclonic storm formed in the southeast Bay of Bengal and moved away northeastwards across the Chittagong coast in the first week of May. It caused very heavy rain in the Bay Islands and south Assam. The track of the storm is shown in Fig. 1.

#### Rainfall

Rainfall was in excess in many parts of north India, the central parts of the country and the eastern half of the Peninsula during this season. A few spells of heavy rain accompanied by squalls and hail caused damage to paddy and mango crops in Andhra Pradesh during April and May. Gujarat State, Konkan and Marathwada had practically no rain during March and April. The total rainfall for the period from 1 March to 31 May 1971, in terms of percentage departures from the normal, is shown in Figs. 2(a) and 2(b).

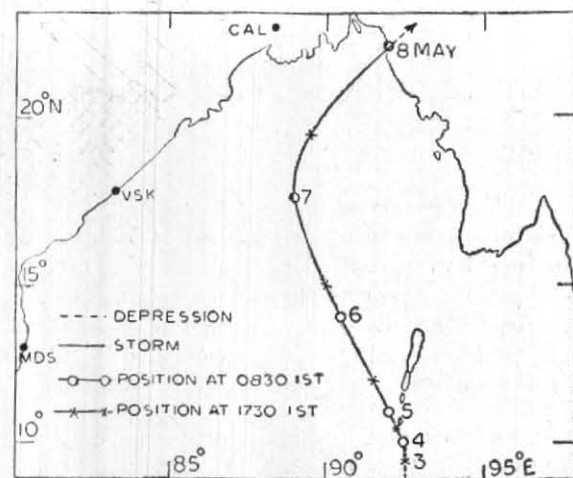


Fig. 1. Track of a storm/depression during March-May 1971

#### Arrival of the monsoon

The southwest monsoon set in over Kerala on 27 May and advanced rapidly over the Peninsula upto Konkan by the end of the month. The arrival of the monsoon over the Peninsula, this year, was 5 to 10 days ahead of its normal date of onset over the Indian Peninsula.

#### Temperature

April and May were especially cool, with daily maximum temperatures appreciably to markedly below normal, in many parts of north India. In March, moderate cold wave conditions prevailed over some parts of northwest India and Gujarat State, and in the interior parts of Maharashtra on a few days in the first week of the month. Some parts of Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal also experienced a moderate cold wave during the second week of March.

The main weather features for each month were as follows.

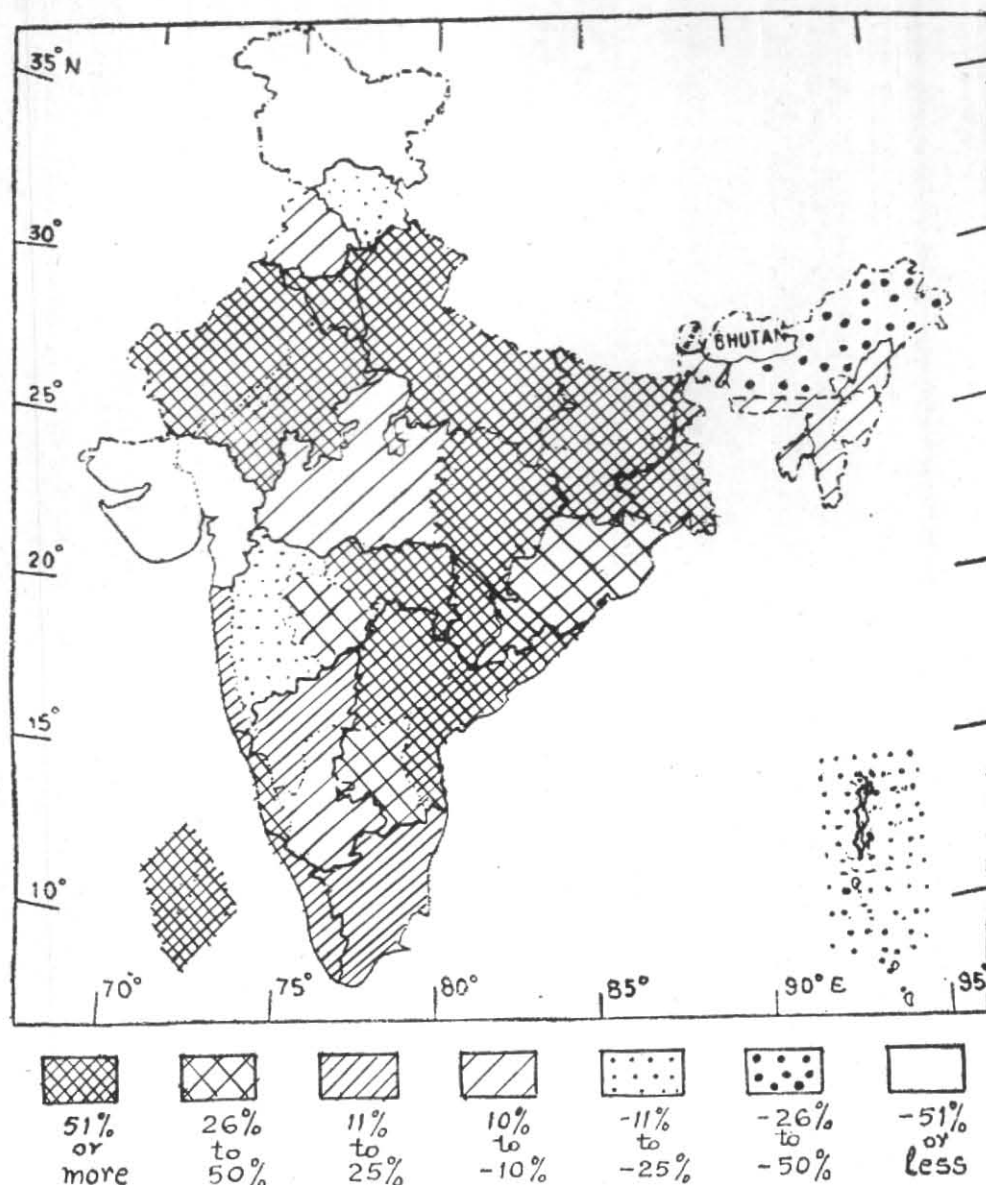


Fig. 2 (a). Rainfall for the period 1 March to 31 May 1971  
(Percentage departure from normal)

### MARCH

Eight western disturbances moved eastwards across northwest India during this month. As most of them were feeble upper air systems, the precipitation in northwest India was scanty and much below normal.

The first western disturbance moved across northwest India as a low pressure system between the 1st and 3rd. It induced a low pressure area over southwest Rajasthan on the 2nd, which

moved eastwards to the Bihar Plains and adjoining West Bengal by the 5th evening. In association with these two systems, there was isolated rain and snow in the Western Himalayas on the 2nd and 3rd and isolated light rain in east Rajasthan and Haryana on the 3rd. There was also widespread rain in east Uttar Pradesh and east Madhya Pradesh on the 5th. Durg recorded 5 cm of rain and Lucknow City 4 cm on 5th.

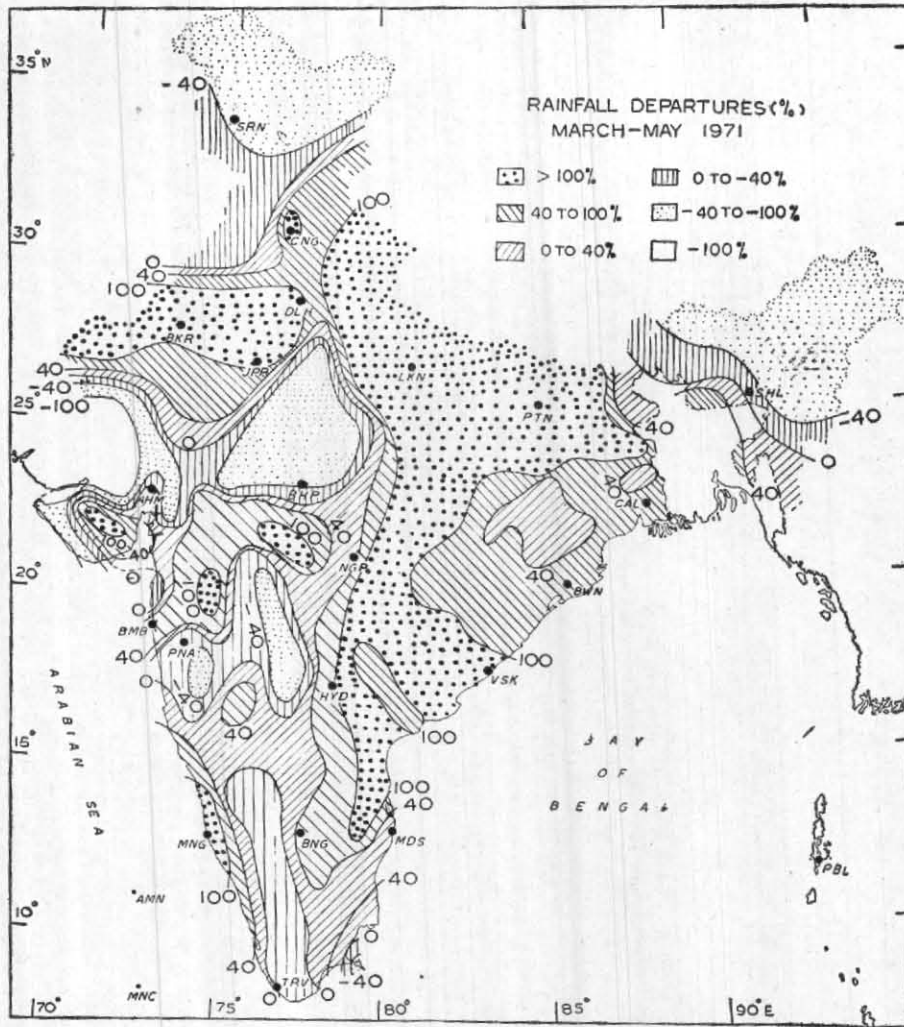


Fig. 2 (b). Percentage departure from normal of rainfall recorded during 1 March to 31 May 1971

In association with the second western disturbance, fairly widespread light to moderate rain and snow occurred in the Western Himalayas with scattered rain or thundershowers in the adjoining plains during this period. Mukteshwar, Dharuchula and Askote reported 3 cm of rain each and Mandi 2 cm on 5th and Nainital 2 cm on 6th.

Some of the remaining six western disturbances caused isolated light rain and snow in Jammu & Kashmir. Otherwise the weather remained mainly dry in northwest India during the last 3 weeks.

A north-south oriented wind discontinuity at 900 m ran across the extreme south Peninsula to the central parts of the country on many days of the first week. A cyclonic circulation in the middle troposphere moved westwards across south Peninsula during the period from 8th to 10th. Under the influence of these systems, scattered rain or thundershowers occurred in Vidharbha, Andhra

Pradesh and the south Peninsula during the first eleven days of the month, the rainfall being rather heavy at a few places in Vidharbha, Andhra Pradesh and Tamil Nadu. This led to an excess of rainfall for March in these areas. The principal amounts of rainfall were:

Date (Mar)	Station	Rainfall (cm)
1	Tuticorin	6
	Atirampattinam	5
5	Brahmapuri	7
	Rentachintala	6
	Gondia, Ongole, Arogyavaram	5
	Tuticorin	7
7	Atirampattinam	6
	Pondicherry	13
10	Coonoor	18
	Pondicherry	11



Saurashtra & Kutch, Konkan and Marathwada had no rain during this month. The rainfall in the rest of the western Peninsula was deficient or scanty.

Daily maximum temperatures were appreciably to markedly above normal in many parts of Gujarat State, Rajasthan and Jammu & Kashmir on many days of the second fortnight, in Himachal Pradesh, northwest Uttar Pradesh and west Madhya Pradesh during the last week and in Konkan from the 10th to the 16th.

Daily minimum temperatures were appreciably below normal in many parts of north India and the interior parts of north Peninsula in the first fortnight. They were also appreciably below normal in the interior parts of Andhra Pradesh on a few days in the last week. Moderate cold wave conditions prevailed in northwest India, Gujarat and in the interior parts of Maharashtra on a few days of the first week, and in some parts of Uttar Pradesh, Madhya Pradesh, Bihar and West Bengal on a few days of the second week.

#### APRIL

Seven western disturbances moved across north-west India during this month. Of these, the four western disturbances which affected north India after the 10th of April, were active. Some of these were associated with upper air troughs extending to about 9.0 km. A few low pressure areas induced over Rajasthan by these systems during the second half of the month, moved eastwards across Uttar Pradesh to Bihar and weakened.

An east-west wind discontinuity at 900 m passed through northeast India during the first fortnight of the month. A cyclonic circulation extending to about 1.5 km lay over Bihar Plateau and neighbourhood on most days during this period, causing incursion of moist southerlies from the Bay into northeast India.

In association with the systems mentioned above, there was unusual thundershower activity in many parts of north India, particularly in north-east India and Uttar Pradesh, leading to an excess of rainfall in these areas. Thundershower activity was most marked during the period 11 to 28 April. Persistent rainfall in Uttar Pradesh and Bihar during this period, and hailstorms with squalls that swept over these areas on some days, caused considerable damage to rabi crops, particularly wheat. Some parts of Haryana and Punjab also experienced hailstorms with squalls on a few days.

The principal amounts of heavy rainfall in north India during this month were:

Date (Apr)	Station	Rainfall (cm)
5	Agartala	8
13	Tura	8
15	Goalpara	16
	Calcutta	7
16	Gopalpur	13
9	Gonda	13
21	Quazigund	7

Gujarat and Marathwada had no rain during this month. The rest of the Peninsula had scattered thundershowers, mostly in association with the seasonal north-south wind discontinuity at 900 m over the area. A cyclonic circulation extending upto 1.5 km lay over Vidarbha from the 18th to the 21st. A well marked trough in the middle and upper troposphere, associated with a western disturbance, moved eastwards across north Peninsula during this period. These systems caused good thundershowers in Vidarbha from the 18th to the 20th and in Andhra Pradesh from the 18th to the 22nd, leading to an excess of rainfall in Andhra Pradesh during this month. Excess of rainfall in Andhra Pradesh caused damage to paddy and mango crops. The principal amounts of rainfall in the Peninsula during this month were:

Date (Apr)	Station	Rainfall (cm)
9	Waltair	9
16	Waltair	6
17	Tirupathi, Vellore, Bangalore AP	6
20	Nidadavolu	9
	Alleppey	7
	Waltair, Visakhapatnam	6

Daily maximum temperatures were appreciably to markedly below normal in many parts of north-east India on most days, in Uttar Pradesh during the second fortnight and in many parts of north-west India and Madhya Pradesh in the third week of April. They were as much as 10-15°C below normal in some parts of Uttar Pradesh, Bihar and the adjoining parts of Madhya Pradesh and Orissa from the 18th to the 21st. They were also markedly below normal in Andhra Pradesh from the 18th to 22nd. But, appreciably above normal maximum temperatures were recorded in many parts of northwest India, Madhya Pradesh and Gujarat State on many days during the first two weeks of the month.

## MAY

Nine western disturbances affected north India during this month, four in the first fortnight and five in the second half. One of them moved as a surface low pressure area from the central divisions of West Pakistan to Uttar Pradesh across Rajasthan from the 14th to 18th. Three low pressure areas were induced by these systems over Rajasthan. The first low pressure area moved eastwards from Rajasthan to Uttar Pradesh between the 6th and 8th. The second one moved from Rajasthan to north Madhya Pradesh and adjoining south Uttar Pradesh between the 12th and 14th. The third low pressure area which was induced over west Rajasthan on the 21st, persisted there till the next day and became unimportant on the 23rd.

Apart from induced low pressure areas, a cyclonic circulation extending to 1.5 km persisted over northeast Madhya Pradesh and adjoining Bihar State on most days of the month. This caused an incursion of moist southerlies from the Bay of Bengal into northeast India. An east-west wind discontinuity at 900 m also passed from Bihar to Assam on many days of the month. Three troughs in the westerlies in the middle and upper troposphere, associated with western disturbances, moved eastwards across northeast India during the first fortnight.

Under the influence of the systems mentioned above, there was abnormal thundershower activity and excess of rainfall in many parts of north India. The main rainfall amounts in north India during the month were :

Date (May)	Station	Rainfall (cm)
13	Chandigarh	10
21	Baṅkura	7
22	Sikar	8
26	Dhubri	10
	North Lakhimpur	8

Rainfall ranging from 3 to 5 cm were reported from a few stations in northeast India, Uttar Pradesh and northwest India on many days of the month. According to press reports, abnormal thundershower activity in north India, accompanied with squalls, duststorms and hail, caused considerable damage to rabi crops, particularly, wheat and other fruit crops in Uttar Pradesh, Bihar, Punjab, Haryana and Himachal Pradesh. Rajasthan experienced duststorms on many days. About a score of people died in Allahabad and Badarpur (near New Delhi) on account of severe thundersqualls in the third week.

A depression formed in the south Andaman Sea and the adjoining southeast Bay on the evening of 3rd. It intensified into a cyclonic storm on the morning of 5th near 11°N, 92°E. Moving initially northnorthwest, and later recurving northeastwards, it crossed the Chittagong coast on the morning of 8th. Thereafter, it weakened rapidly into a low pressure area and moved away northeastwards across south Assam by the 9th. This system caused widespread rain with a few very heavy falls in the Bay Islands from the 3rd to 5th in south Assam from the 8th to 10th. The principal rainfall amounts were :

Date (May)	Station	Rainfall (cm)
3	Kondul	25
4	Car Nicobar Airport	20
5	Long Island	12
8	Haflong	17
	Agartala	14
	Kailashahar	12
10	Tura	14
	Kailashahar	13

A north-south wind discontinuity at 900 m passed from east Madhya Pradesh to extreme south Peninsula on most days of the month. An upper air cyclonic circulation extending between 1.5 and 6.0 km a.s.l. moved westwards from southwest Bay to southeast Arabian Sea across the south Peninsula between the 14th and 16th. These systems provided good thundershowers in the eastern parts of the Peninsula and in Madhya Pradesh during the first three weeks; the thunderstorms being more marked in the third week. Rain, accompanied by gales and hail, caused heavy damage to standing paddy crops and mangoes in some parts of Andhra Pradesh. A severe thundersquall swept through the twin cities of Hyderabad and Secunderabad on the 15th, causing some loss of life and disrupting the power supply.

The *southwest monsoon* set in over south Andaman Sea and adjoining southeast Bay on the 18th. Subsequently, it advanced into north Andaman Sea by the 21st and covered the southwest, east central and northeast Bay of Bengal by the end of the month. Widespread rain with isolated heavy falls occurred in the Bay Islands between the 18th and 24th.

A trough of low pressure formed off the Kerala coast on the 26th. A mid-tropospheric cyclonic circulation developed over Commorin-Maldives area on the 26th and moved northwestwards to the Laccadive Islands on the 27th. Under the influence of these systems, the monsoon set in over Kerala

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on the 27th, *about 5 days ahead of the normal date of onset*. A well marked low pressure area developed off the Mysore coast on the 28th. It moved northnorthwestwards and lay off Maharashtra-south Gujarat coast on the 31st. Under its influence, the monsoon advanced rapidly upto Konkan and into east central Arabian Sea upto 20°N by the end of the month. The northern limit of the monsoon extended from Bombay to Nellore and Imphal on the 31st. The arrival of the monsoon this year over the Peninsula was 5-10 days ahead of the normal dates of onset.

The principal amounts of heavy rainfall in the Peninsula during the month were :

Date (May)	Station	Rainfall (cm)
18	Palghat	11
23	Fort Cochin	14
27	Amini	19
	Fort Cochin	16
28	Calicut	22
	Mangalore	14
30	Honavar	19
	Dabholm (Goa)	17
	Calicut	14
	Karwar	11
	Mangalore town and AP	10
31	Mangalore town	10

The month of May was generally cool in many parts of north India, with maximum temperatures appreciably to markedly below normal on most days.