

Weather

MONSOON SEASON (JUNE-SEPTEMBER 1972)

CHIEF FEATURES

Advance of the monsoon

The southwest monsoon temporarily advanced over south Peninsula towards the end of the second week of May, but again retreated during the end of the third week. It revived over Kerala by as late a date as 18 June. Subsequently it covered the entire country by 9 July. The advance of the monsoon over the Peninsula and northeast India was delayed by 10 to 15 days and over the central parts of the country by a week. Its advance into northwest India was nevertheless approximately near the normal date of onset in this area.

Activity of the monsoon

The monsoon activity was normal in northeast India, extreme northwest India, Madhya Pradesh and the south Peninsula but weak in north Peninsula, Rajasthan and Bihar plains. The delayed onset of the monsoon in June, and a prolonged break in it in the second half of July, led to droughts in many parts of north India and north Peninsula.

Withdrawal of the monsoon

The southwest monsoon withdrew from north-

west India on 6 September. By the end of that month, it had withdrawn from Uttar Pradesh, Madhya Pradesh, Bihar, Gujarat and Maharashtra States. It withdrew from the rest of northeast India by 3 October and from the rest of the country by 14 October. The withdrawal of the monsoon from north India and north Peninsula was about a week to 10 days earlier than the normal date of withdrawal.

Depressions and cyclones

Three cyclonic storms and six depressions developed during the southwest monsoon. The three cyclones formed in the Bay of Bengal. Out of the six depressions, two formed in the Arabian Sea, two in the Bay of Bengal and two over land. The tracks of the systems are shown in Fig. 1.

The total rainfall for the period from 1 June 1972 to 30 September 1972, in terms of departure from the normal, is shown in Figs. 2 (a) and 2 (b). The progress of the monsoon over the various subdivisions in India month by month is given in Fig. 3. The important features of weather during the different months are given below.

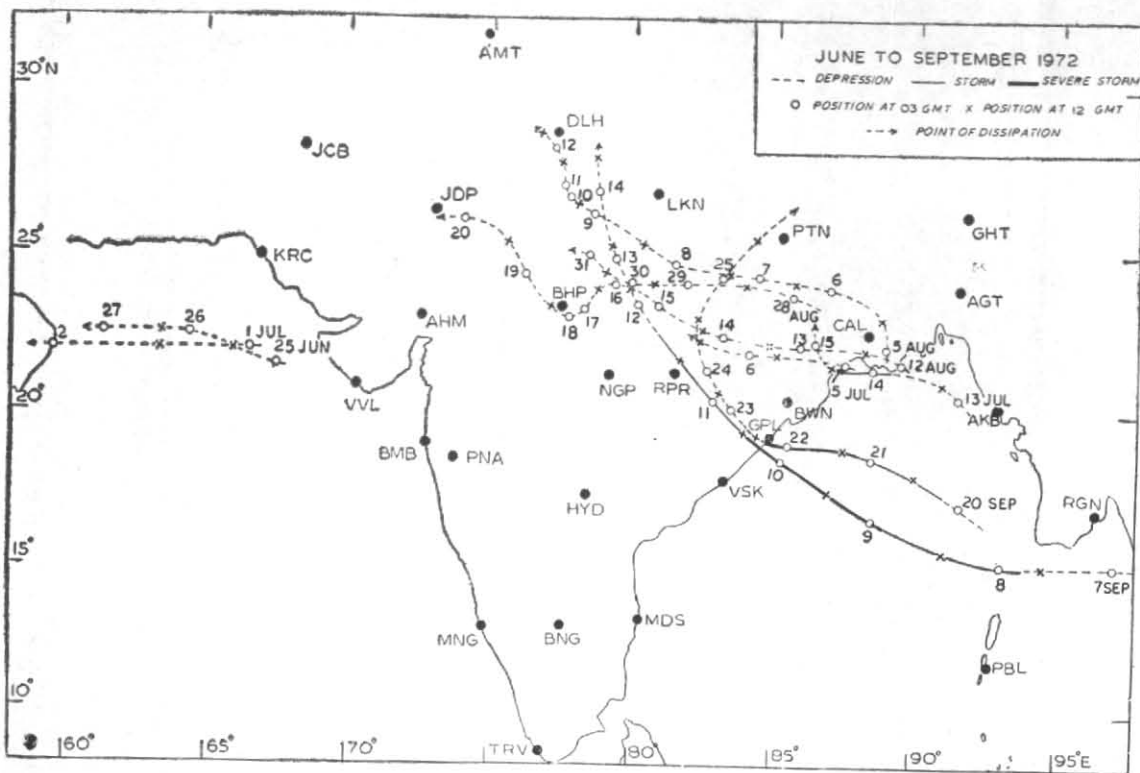
JUNE

The southwest monsoon set in temporarily over the south Peninsula towards the end of the second week of May; but it retreated from there by the end of the third week of May. Its revival over south Peninsula and its further advance over the country was considerably delayed this year. The northern limit of the monsoon passed from Jaffna to Chittagong on 1 June. The monsoon was generally weak to moderate over the Bay during the first fortnight of June. The Bay branch of the monsoon advanced into Assam and adjacent States and into Sub-Himalayan West Bengal by 13 June. The monsoon revived over Kerala as late as 18 June. It advanced upto Gujarat State, south Madhya Pradesh and the rest of northeast India by 23 June, and into southeast Rajasthan, north Madhya Pradesh and east Uttar Pradesh by the 24th. It covered the entire

country outside Jammu & Kashmir by the end of June. The advance of the monsoon over the south Peninsula and northeast India was delayed by about a fortnight, over north Peninsula by about 10 days and over east Uttar Pradesh and central parts of the country by about a week. However, its advance into northwest India was near the normal date of onset in this area.

The advance of the monsoon and its activity over the different parts of the country during this month was influenced by the following systems:

(i) Movement of cyclonic circulation from northwest Burma to Bangla Desh between 10 and 13 June; (ii) Development of a trough of low pressure off Kerala coast on 17th, its northward extension to northeast Arabian Sea off Gujarat coast by the 22nd, and its persistence off the west coast till



Tracks of storms/depressions during June to September 1972

the end of the month; (iii) Formation of a depression in northeast Arabian Sea and its westward movement towards Oman coast between 25th and 28th; (iv) Formation of a low pressure area off Gujarat coast towards the end of the month; (v) Northwestward movement of a low from west central Bay of Bengal to north coastal Andhra Pradesh and adjoining Orissa on the 27th and 28th, and (vi) The formation of another low off north Orissa coast towards the end of the month.

The monsoon was active in Gangetic West Bengal from 23rd to 25th, in east Rajasthan on 24th, in Madhya Maharashtra on 25th, in Konkan and coastal Mysore on many days in the last week and in Gujarat State on 30th. Heavy rain in Assam and adjacent States in the latter half of June caused floods in the *Brahmaputra* and the *Barak* rivers. This caused considerable damage to paddy and jute crops, and other property in Nowgong, north Kamrup, Cachar and Mikir hills districts. Dislocation of road and rail communications was also reported in these areas.

Five western disturbances moved eastwards across the Western Himalayas during the first three weeks, causing scattered rain or thunder-

showers on many days in the Western Himalayas. Scattered or isolated thundershowers occurred in the plains of northwest India on some days during this period. Scattered or isolated duststorms also occurred in Punjab, Haryana and Rajasthan during the periods 3rd and 4th, 8th to 10th and 18 to 21 June. Duststorms paralysed rail services between Bikaner and Ganganagar in Rajasthan for some days and destroyed cotton seedlings over a large area in the State.

Under the influence of an east-west trough running from Bihar Plains to Assam and adjacent States and a north-south trough running from northeast Madhya Pradesh to the interior parts of south Peninsula, there were scattered or isolated thundershowers in northeast India and the Peninsula on many days in the first fortnight.

The principal amounts of very heavy rainfall (20 cm and above) during the month were — Port Blair 21 cm on 8th; Cherrapunji 22 cm on 16th; Cherrapunji 70 cm and Silchar 23 cm on 20th; Cherrapunji 48 cm, Ratnagiri 22 cm, Cooch Behar and Deogarh 20 cm each on 21st; Cherrapunji 34 cm on 22nd; Cherrapunji 30 cm and Chaparmukh 26 cm on 23rd; and Chaparmukh 20 cm on 25th.

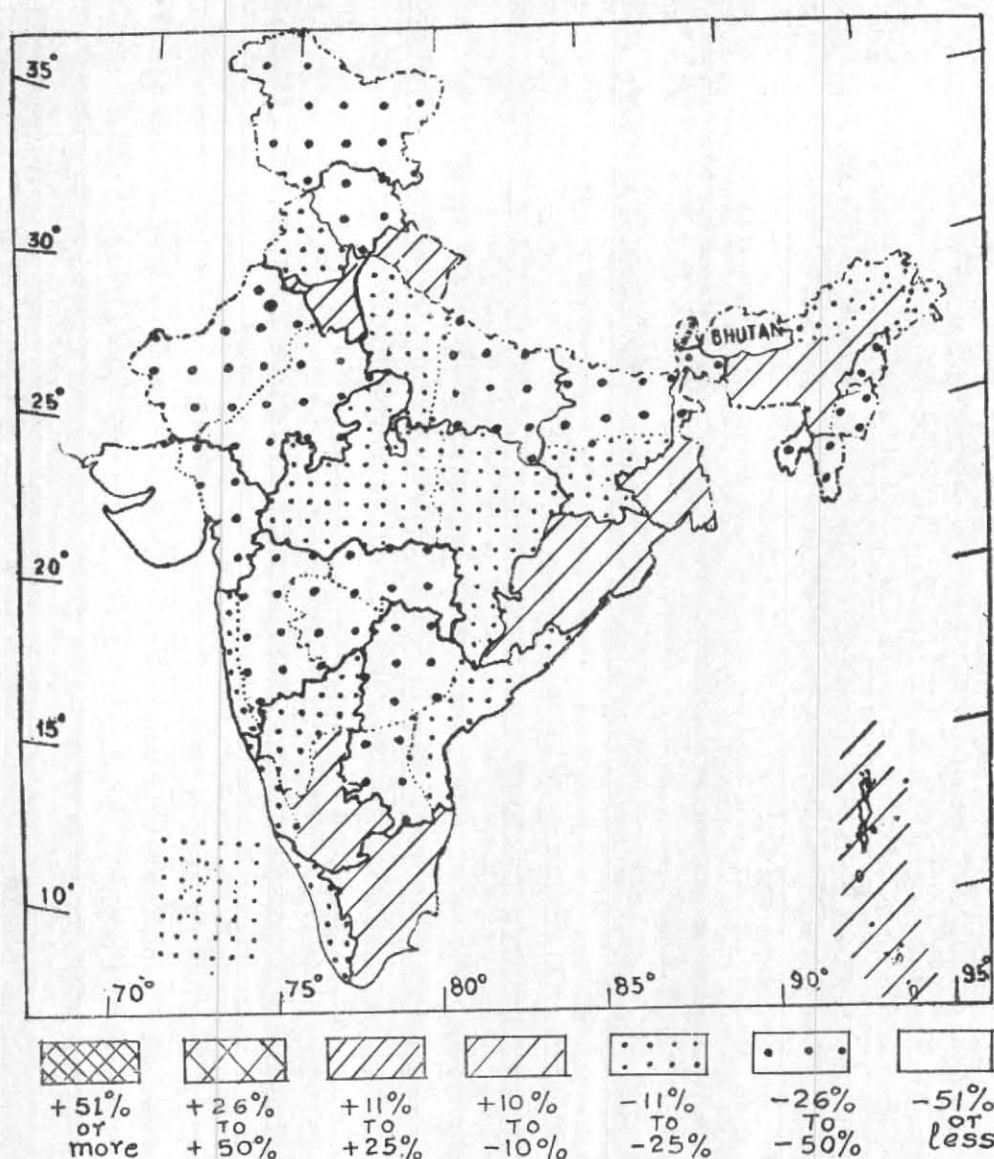


Fig. 2 (a)

Rainfall for the period 1 June to 30 September 1972
(Percentage departures from normal)

JULY

The southwest monsoon advanced into Jammu & Kashmir on 9 July and thereby covered the entire country by this date. The monsoon was generally active over many parts of the country during the first two weeks under the influence of the following systems :

(i) A low pressure area, which lay over northeast Arabian Sea off the Gujarat coast on 29 June, moved westwards and concentrated into a depression over northwest Arabian Sea on 1 July. Later, it weakened into a low off east Arabian coast by the 2nd, (ii) A low pressure area moved northwestwards from Gujarat State to Pakistan

between 2nd and 4th; (iii) A trough of low which persisted off the west coast during the first week and off Kerala-Mysore coasts during the subsequent two weeks; (iv) A low that lay off the Orissa coast on 29 June, moved to central Madhya Pradesh by 2 July and weakened; (v) A depression that moved from the head Bay to north Madhya Pradesh between 5th and 7th and merged with the monsoon trough on the 8th; (vi) A severe cyclonic storm over north Bay of Bengal on the 14th. It moved westnorthwestwards and rapidly weakened into a low by the 15th evening over Bihar Plateau; and (vii) Four western disturbances which moved across northwest India during the first 12 days.



Fig. 2 (b)

Percentage departures from normal of rainfall occurred during 1 June to 30 September 1972

The monsoon was active in Orissa, Madhya Pradesh, Konkan and Kerala for about a week, and in Gangetic West Bengal, Bihar Plateau, Uttar Pradesh, Haryana, Punjab, Gujarat State, Vidarbha, Telangana and coastal Mysore on some days during the first fortnight. It was vigorous in east Madhya Pradesh on 1st, in Telangana on 4th, in Gangetic West Bengal on 14th, in Orissa on 15th, in Kerala on 17th and in Punjab and Haryana on a few days between 6th and 12th.

According to press reports, heavy rain in Bombay between 30 June and 2 July, flooded vast areas and paralysed city life. Breaches on the railway track between Virar and Vapi dislocated train services between Bombay and Gujarat for some days. Heavy rain in northwest India between the 6th and 12th inundated low lying areas in Punjab, Haryana and Delhi. Some 80 houses

were damaged in the villages near Delhi. Towards the end of the first week, the *Narmada* flooded the Bombay-Agra National Highway near Indore, disrupting vehicular traffic. The river *Godavari* flooded Bhadrachalam town. Some parts of Jalgaon district were also flooded, causing loss to crops and cattle life. Some villages near Belgaum were submerged due to overflow from Malaprabha dam. The cyclonic storm that struck north Orissa towards the end of the second week flooded vast areas in Cuttack, Balasore, Dhenkanal and Keonjhar districts, causing heavy damage to railway tracks, irrigation works, houses and crops in these areas. Train services in this section of the Southeastern Railway were dislocated for some days. Vigorous monsoon conditions in Kerala on the 17th caused floods in some parts of Calicut district.

The western part of the monsoon trough moved to the foot of the Himalayas by the 14th, and the eastern part moved north by the 17th. The entire monsoon trough lay close to the foot hills during the rest of the month, leading to *break* monsoon conditions over the whole country during the second half of July. But as is expected under *break* monsoon conditions, heavy rain was reported in Assam and adjacent States and Sub-Himalayan West Bengal and in the catchment areas of the *Brahmaputra*, the *Teesta* and the north Bihar rivers. Serious floods were reported in the northern districts of Assam extending from Lakhimpur to Kamrup, and in Cooch Behar and Jalpaiguri districts of north Bengal with extensive damage to crops and houses. Road communications with Assam were cut off. About 90 people were reported to have died due to floods in these areas. *Break* monsoon conditions prevailed over the rest of the country extending over a fortnight in the second half of July. A severe drought was reported in many parts of north India and north Peninsula, with some damage to *kharif* crops.

Five western disturbances moved eastwards across the Western Himalayas during the second half of the month causing scattered or isolated rainfall in that area.

The principal amounts of very heavy rainfall (20 cm and above) during the month were — Pendra and Agumbe 22 cm each on 1st; Mahabaleshwar 34 cm, Bhira 22 cm and Santacruz 20 cm on 2nd; Maya Bandar 24 cm on 6th, Mahabaleshwar 20 cm on 7th; Mahabaleshwar 27 cm and Narsinghpur 22 cm on 8th; Delhi (Palam) 26 cm on 9th; Jalpaiguri 20 cm on 10th; Sandheads 37 cm on 14th; Cherrapunji 20 cm on 27th and Baghdogra 29 cm on 28th.

AUGUST

The prolonged *break* monsoon conditions that affected the country in the second half of July, continued upto the 4th of August. Subsequently, there was good monsoon activity over many parts of central and north India under the influence of the following system — (i) A deep depression that moved from Bangla Desh and adjoining Gangetic West Bengal to Haryana and adjoining east Rajasthan between 5th and 13th; (ii) A deep depression that moved from north Bay to Rajasthan between 12th and 22nd; (iii) A low pressure area that moved from northwest Bay and adjoining coastal Orissa to south Uttar Pradesh and adjoining north Madhya Pradesh between 22nd and 27th; (iv) A deep depression that moved from Bihar Plateau and adjoining Gangetic West Bengal to northwest Madhya Pradesh and adjoining east Rajasthan between 28th and 31st.

The monsoon was active or vigorous in Orissa on 5th, 13th, 14th, 22nd and 23rd; in Gangetic West Bengal on 7th, 12th to 16th, 23rd and 26th to 29th; in Bihar Plateau on 6th, 7th, 12th to 16th, 27th and 28th; in Bihar Plains on 6th and 7th, in Madhya Pradesh from 8th to 10th, 13th to 19th and from 22nd to 30th; in Vidarbha from 16th to 18th and on 23rd and 24th; in Madhya Maharashtra from 17th to 19th; in Uttar Pradesh from 6th to 11th and 26th to 29th; in Haryana from 10th to 12th; in Rajasthan from 9th to 11th, 20th to 22nd, 25th and 26th; and in Gujarat State from 17th to 22nd.

Six western disturbances moved eastwards across the Western Himalayas during this month causing good rainfall in the Western Himalayas and

the adjoining plains. Isolated heavy to very heavy falls occurred in the hills of west Uttar Pradesh on a few days in the first fortnight. The monsoon was active in Punjab, Haryana and the plains of west Uttar Pradesh on a few days between 24th and 27th.

According to press reports, breaches in dams and floods in some of the rivers of Rajasthan led to inundation of many villages in Bharatpur and Sawai Madhopur districts in the second week. About 5000 heads of cattle were lost and many thousands of houses were damaged. Some areas in Agra district were also flooded. Again in the last week, heavy rain in the plains of west Uttar Pradesh and adjoining Rajasthan led to breaches in Bayana-Bharatpur section of the Western Railway. Some parts of Madhya Pradesh and Broach and Baroda districts in Gujarat State were affected by floods during the second half of the month, which disrupted vehicular traffic and caused some damage to crops, roads and buildings in those areas. The south Bengal rivers flooded low lying areas in Midnapore and Kharagpur towns in the last week.

The monsoon was generally weak in many parts of the Peninsula during the first fortnight and during the last week, leading to deficient or scanty rainfall. This accentuated the drought condition in Andhra Pradesh and the northern parts of Interior Mysore.

The principal amounts of very heavy rainfall (20 cm and above) during the month were — Satna 22 cm on 9th; Narnaul 24 cm on 12th;

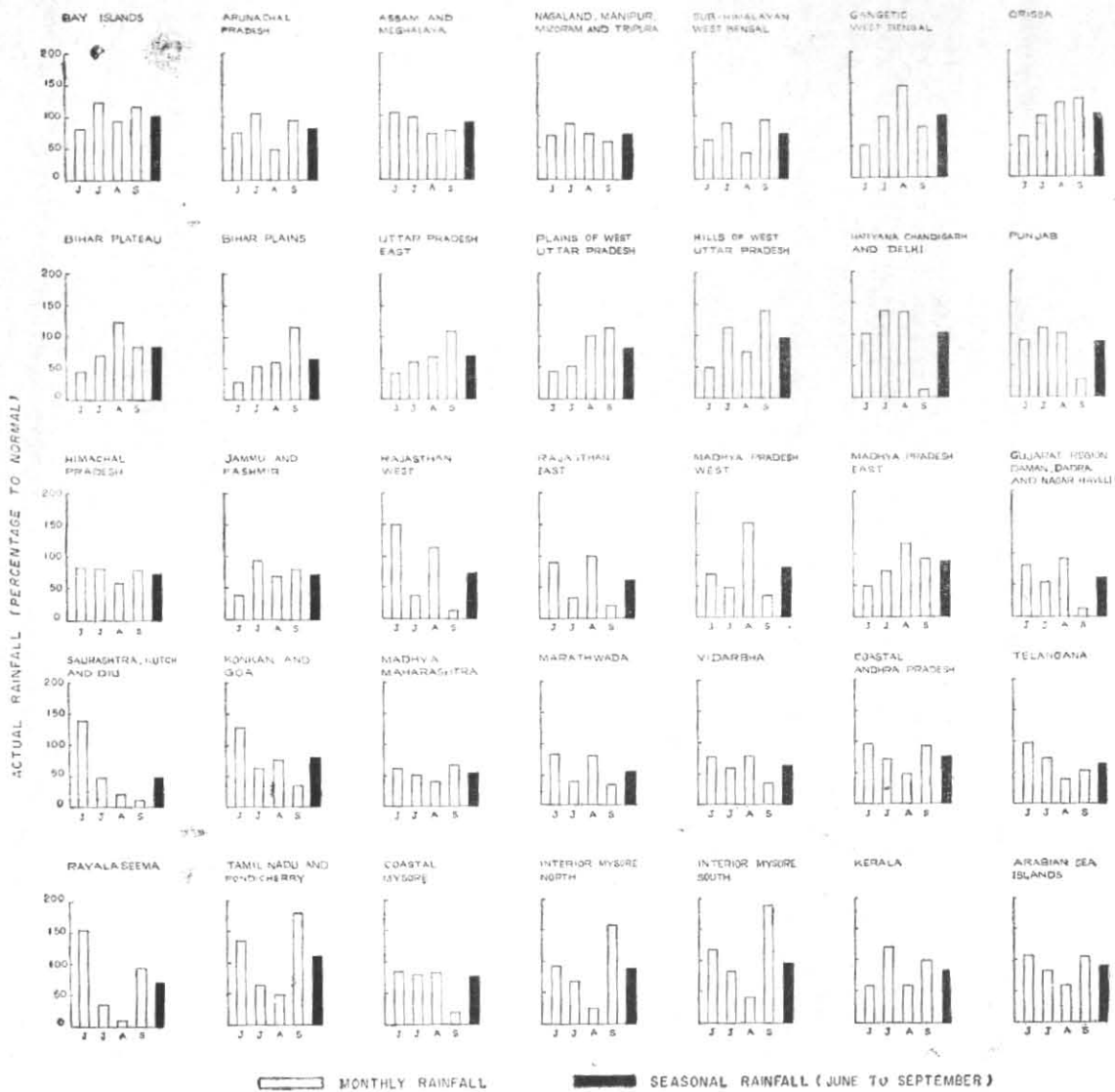


Fig. 3

Progress of monsoon month by month, June to September 1972

Baripada 24 cm on 13th; Jabalpur 23 cm on 15th; Khandwa 21 cm on 18th; Sagar Island 20 cm on

27th; Burdwan 22 cm on 28th; Jabalpur 23 cm on 30th; and Pachmarhi 22 cm on 30th.

SEPTEMBER

There was good rainfall in many parts of north-west India and the south Peninsula during the month. The following major systems influenced the weather recorded during this month — (i) A cyclonic circulation in the lower troposphere near Orissa and adjoining north Andhra coast from 6th to 8th; (ii) A north-south oriented trough extending to 2.1 km a.s.l. passing from Vidarbha and adjoining southeast Madhya Pradesh to Tamil

Nadu between the 5th and 7th; (iii) A severe cyclonic storm in the Bay of Bengal, which crossed the south Orissa and adjoining north Andhra coast, and finally dissipated over the Uttar Pradesh hills in the second week; (iv) A severe cyclonic storm in the Bay of Bengal, which crossed south Orissa and adjoining north Andhra coast, moved northwards and later recurved northeastwards as a low across north Bihar and adjoining Nepal

between the 20th and 26th; and (v) An east-west trough extending to the middle troposphere from the Andaman Sea to Laccadive area across south Peninsula during the second half of the month. Associated with this trough, cyclonic circulations moved from southwest Bay to the Laccadive area from the 14th to 18th, and from 27th to 30th.

The monsoon was active or vigorous in Orissa from 10th to 12th and 22nd to 24th; in Gangetic West Bengal and Bihar Plateau on 11th and 12th; in Bihar Plains on 12th and 26th; in east Madhya Pradesh on 12th, 13th, 24th and 25th; in Uttar Pradesh from 13th to 15th; in east Uttar Pradesh on 25th and 26th; in Vidarbha on 9th; in Madhya Maharashtra on 10th; in Konkan on 10th and 12th; in Rayalaseema on 7th and from 17th to 20th; in Tamil Nadu on 8th and from 28th to 30th; in Interior Mysore from 16th to 19th; and in Kerala from 23rd to 25th. Scattered heavy to very heavy rain occurred in the hills of west Uttar Pradesh on 14th and 15th and in Sub-Himalayan West Bengal on 26th. The monsoon was generally weak in Gujarat and Maharashtra States during the month.

The eastern part of the monsoon trough moved close to the foot of the Eastern Himalayas from 1st to 4th, while the western part lay close to the foot of the Western Himalayas from 2nd to 7th. *Break* monsoon conditions prevailed over the country during the first six days of the month. During this period, fairly widespread rain occurred in many parts of northeast India in the first week with isolated heavy falls on some days. According to press reports, many parts of Lakhimpur district were affected by floods in the *Brahmaputra*. The flood waters of the *Diphu* inundated Diphu Bazar in Mikir hills district.

Seven western disturbances moved eastwards across northwest India during the month giving fairly widespread rain in the Western Himalayas

and scanty rainfall in the plains of northwest India.

According to press reports, the severe cyclone that struck south Orissa and adjoining north Andhra coast on the 10th caused considerable damage to crops, houses, telecommunications and other property in the coastal districts of Orissa. The worst affected were Ganjam, Puri and Cuttack districts. Some parts of Srikakulum district also suffered considerable damage due to the cyclone. About 90 people and 8000 cattle heads were reported to have lost their lives. The damage caused by the other severe cyclone which struck coast near about the same place within 12 days (on 22nd) was not so serious compared to the havoc caused by the earlier cyclone. But, due to heavy rain and floods in the *Vamsadhara* many villages in Srikakulum and Koraput districts were inundated resulting in considerable damage to crops and houses. Puri and Ganjam districts also suffered some damage due to this cyclone.

The principal amounts of very heavy rainfall were—Dehra Dun 18 cm on 6th, 17 cm each on 7th and 8th; Kalingapatam 21 cm on 11th; Bhira 18 cm on 12th; Datia 17 cm on 13th; Ramsanehighat 27 cm and Kheri 19 cm on 14th; Nainital 27 cm on 15th; Chandbali 17 cm on 22nd; and Jalpaiguri 23 cm on 26th.

The southwest monsoon withdrew from Jammu & Kashmir, Himachal Pradesh, Punjab, Harayana and Rajasthan on the 6th, from west Uttar Pradesh, west Madhya Pradesh and Gujarat State on 18th, from Maharashtra State on the 26th, from east Uttar Pradesh and northeast Madhya Pradesh on 27th and from Bihar State and southeast Madhya Pradesh by 30th. It withdrew from the rest of northeast India on 3 October, from Telangana and north Interior Mysore on 9th, from coastal Andhra Pradesh, Rayalaseema, coastal and south Interior Mysore by 12th and from the rest of the country by 14th.