

## Weather

### MONSOON SEASON ( JUNE - SEPTMBER 1975 )

#### CHIEF FEATURES

##### *Advance of the monsoon*

The Bay branch of southwest monsoon advanced into south Andaman Sea and extreme south Bay on 18 May and covered the entire south Bay, east central and northeast Bay, Assam and adjacent States and adjoining Sub-Himalayan West Bengal by the end of that month. The Arabian Sea branch advanced into Comorin-Maldive area on 24 May and into Kerala and entire south Arabian Sea on 31 May. The monsoon covered the entire Bay of Bengal, Arabian Sea, the Peninsula, Gujarat State, Madhya Pradesh, Uttar Pradesh and the rest of northeast India by 21 June and northwest India by the end of June. For about ten days from 7 to 16 June the monsoon did not progress over the country. The advance of the monsoon into north Peninsula, Gujarat State, Madhya Pradesh and northeast India outside Assam and adjacent states was delayed by about a week to ten days. Its advance into west Rajasthan was earlier by about a week and into the rest of the country by about the normal date.

##### *Activity of the monsoon*

The monsoon was generally active over the country during this season leading to normal or excess rainfall over the country for the season. Bombay

(Colaba) recorded an exceptionally heavy fall of 42 cm on 31 July. The monthly and seasonal rainfall over the 35 meteorological sub-divisions in India is given in Fig. 1. Departure of the seasonal rainfall (June to September) from the normal is shown in Figs. 2(a) and 2 (b). There was no long break in monsoon this year.

##### *Withdrawal of the monsoon*

The southwest monsoon withdrew from northwest India between 23 and 25 September, from Uttar Pradesh, Madhya Pradesh, Bihar State, Sub-Himalayan West Bengal, Gujarat and Maharashtra States, north Interior Karnataka and Telangana between 8 and 16 October and from the rest of the country outside Kerala and Tamil Nadu between 25 and 27 October. This monsoon persisted over most parts of the country for one to two weeks more.

##### *Depressions and cyclones*

One cyclonic storm and five depressions developed in the Bay of Bengal—one depression in the Arabian Sea and two over land. The tracks of these systems are given in Fig. 3.

#### SIGNIFICANT MONTHLY FEATURES

##### JUNE

The southwest monsoon which had covered Comorin-Maldive area, Lakshadweep, Kerala, south Arabian Sea, most parts of Bay of Bengal and Assam and adjacent States by 31 May, advanced further along the west coast up to south Konkan by 7 June. There was a lull upto 16 June. Again it rapidly advanced into the rest of the Peninsula, rest of northeast India, Madhya Pradesh, Uttar Pradesh, Gujarat State, East Rajasthan, Haryana and Himachal Pradesh between 17th and 23rd. There was no further advance of the monsoon during the next 6 days. It advanced into the remaining areas of northwest India on

30th, thereby covering the entire country by that date.

The advance of the monsoon into north Peninsula, Gujarat State, Madhya Pradesh and northeast India outside Assam and adjacent States was delayed by about a week to ten days. Its advance into west Rajasthan was earlier by about a week and into the rest of the country by about the normal date.

The monsoon was active or vigorous for 8 to 10 days in Kerala, coastal Karnataka and Konkan for 4 to 7 days in Vidarbha, Gujarat State, Madhya

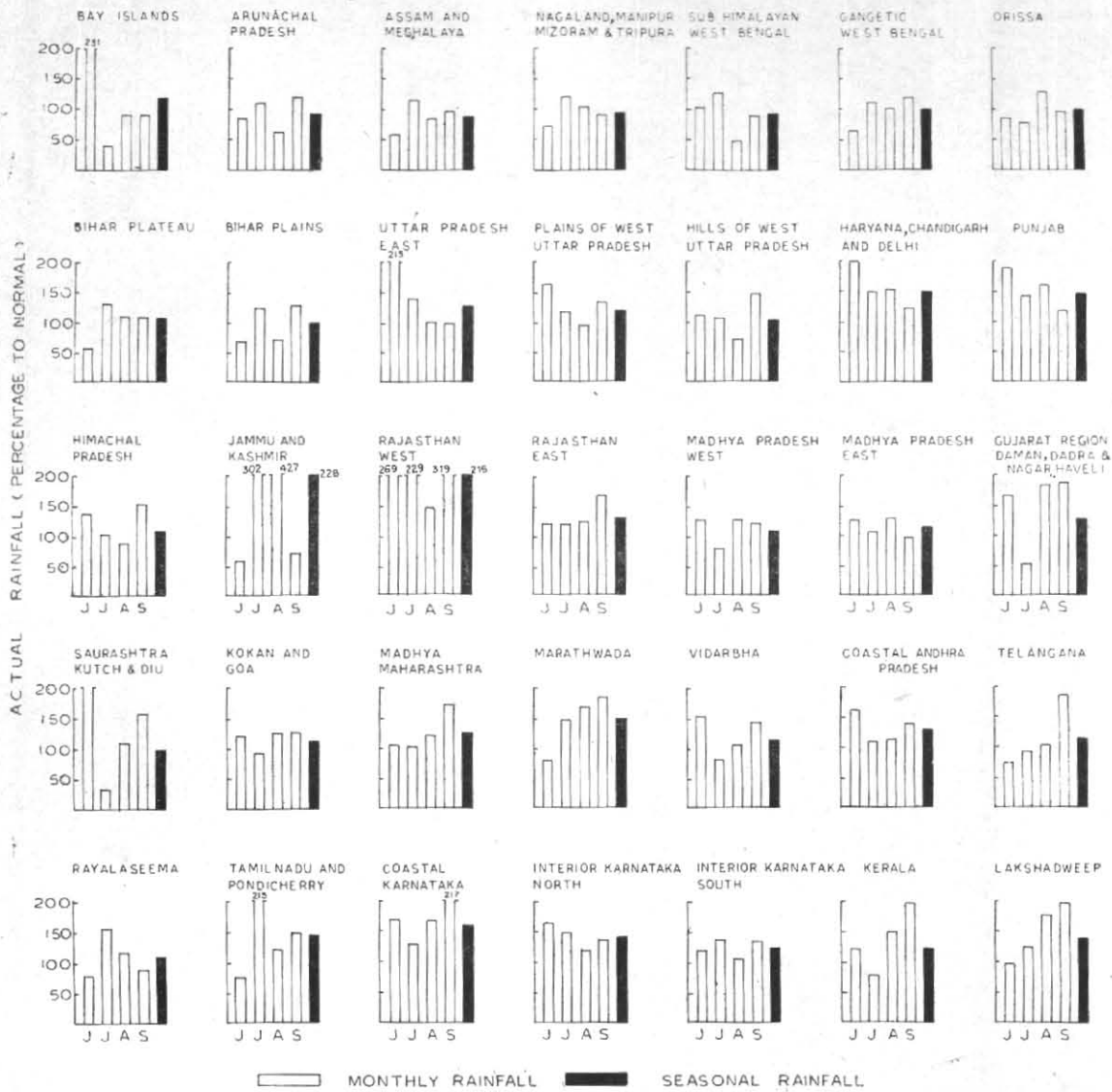


Fig. 1. Progress of monsoon month by month, June to September 1975

Pradesh, Uttar Pradesh and Sub-Himalayan West Bengal, and for 2 to 3 days in south Interior Karnataka, Madhya Maharashtra, coastal Andhra Pradesh, Telangana, Himachal Pradesh, Bihar Plains and Orissa in the second fortnight. It was also active in Assam and adjacent States for about a week during the month. The monsoon was generally weak in coastal Karnataka in the second week and in Marathwada, Vidarbha and Telangana from 20th to 24th.

The advance of the monsoon and its activity over different parts of the country were associated mainly with the following systems :

(i) A trough of low lay off the west coast of India on a few days in the first and second weeks

and on most days in the second fortnight. It was well marked in the second fortnight.

(ii) A deep depression formed over the central Bay of Bengal on 4th, intensified into a cyclonic storm on 6th over northeast Bay, crossed Bangla Desh coast near Chittagong on 7th and moved away as a low across Assam and adjacent States by 9th. This system caused fairly widespread rain with isolated heavy to very heavy falls in the Bay Islands from 5th to 7th and in Assam and adjacent States from 7th to 9th.

(iii) A low lay over west central and adjoining northwest Bay from 12th to 16th. It concentrated into a deep depression on 18th, crossed Orissa coast that night and weakened into a low on 19th

evening. The low moved across Madhya Pradesh and Uttar Pradesh and dissipated over northwest Uttar Pradesh on 23rd.

(iv) The trough off the west coast extended into Gujarat State on 19th and persisted there upto 30th, with a cyclonic circulation in the middle troposphere over Gujarat on many days. A depression moved from Gulf of Cambay to north-east Arabian Sea across Saurashtra between 23rd and 25th and later dissipated.

(v) A low which lay over northwest and adjoining west central Bay on 24th concentrated into a deep depression on 26th moved across Orissa and northeast Madhya Pradesh on 27th and 28th and lay as a low over east Uttar Pradesh on 29th and 30th.

(vi) The seasonal low over west Rajasthan and neighbourhood was well marked from 26th to 30th.

The cyclonic storm which crossed Konkan coast on the evening of 31 May near Alibag, weakened into a low over Maharashtra on 1 June. It caused widespread rain or thundershowers over Maharashtra on 1 June with isolated heavy falls in Konkan.

Six western disturbances moved eastwards across the Western Himalayas during the month—five in the first fortnight and one in the second. The seasonal low over west Rajasthan and adjoining Pakistan was well marked from 7th to 9th and 19th to 23rd. These systems caused fairly widespread rain or thundershowers in Himachal Pradesh on 2nd and 3rd and from 19th to 23rd; and in Haryana on 8th and scattered or isolated rain or thundershowers in northwest India on

many days in the first fortnight and again from 19th to 23rd.

According to press reports, the cyclone which hit Bangla Desh on 7th, damaged about 6,000 houses there and caused floods in some parts of Tripura which inundated low lying areas and standing crops in the beginning of the second week. Floods also affected Kozhikode, Cannanore and Malapuram districts of Kerala in the third week causing considerable damage to crops and houses. Some parts of south Kanara district reported floods in the third week.

The principal amounts of heavy rainfall (20 cm and above) during the month were :

Nilambur 24 on 2nd ; Jalpaiguri 26, Mangalore 20 on 14th; Ratnagiri 24 and Agumbe 21 on 19th Dharampur (Gujarat) 25, Bhira 22 and Nilambur 21 on 20th; Beltangadi 26, Agumbe 25 and Perintalamanna 20 on 21st; Agumbe 29, Mangalore and Beltangadi 27 each, Kasargode 24 and Honavar 20 on 22nd; Agumbe 28 and Mangalore 21 on 23rd; Jalpaiguri 22 on 24th; Baghdogra 20 on 25th; Sironcha 28 and Brahmapuri 20 on 28th; Gondia 21 on 29th.

Moderate heat wave conditions prevailed in east Uttar Pradesh, central and east Madhya Pradesh, Bihar, interior Orissa and Vidarbha on a few days between 12th and 16th. Day temperature were markedly above normal in some parts of Bihar and Orissa from 6th to 10th. They were appreciably above normal in some parts of Uttar Pradesh and Madhya Pradesh on many day between 5th and 18th, in northeast India and north coastal Andhra Pradesh from 5th to 10th and, in Haryana, Punjab, Himachal Pradesh and Jammu & Kashmir from 14th to 17th.

## JULY

The monsoon was active or vigorous in the plains of Uttar Pradesh, Haryana, Punjab and Rajasthan on many days between 13th and 24th; in Punjab on 28th and 29th; in Bihar State from 1st to 8th and 16th to 20th; in Bihar Plains from 26th to 28th; in West Bengal on 10 to 12 days; in Assam and adjacent States, east Madhya Pradesh, Maharashtra State, coastal and south Interior Karnataka and coastal Andhra Pradesh on 6 to 8 days; in Himachal Pradesh, hills of west Uttar Pradesh, west Madhya Pradesh, north Interior Karnataka, Telangana and Kerala on 3 to 5 days in the month. It was also active in Gujarat State and vigorous in Jammu & Kashmir on 15th and 16th. There was a short 'break' in monsoon activity over large parts of the country from 25th to 28th. The monsoon was

also weak in Gujarat State on many days in the month and in northwest India in the first week.

The activity of the monsoon in the different parts of country was associated mainly with the following systems :

(i) A trough of low lay off the west coast of India on most days during the month which was mainly confined to the Karnataka-Kerala coasts between 10th and 20th.

(ii) Four low pressure areas/cyclonic circulations moved along the monsoon trough—one from northwest Bay to Orissa; another from northeast Madhya Pradesh and adjoining Bihar to west Uttar Pradesh between 3rd and 5th; the third



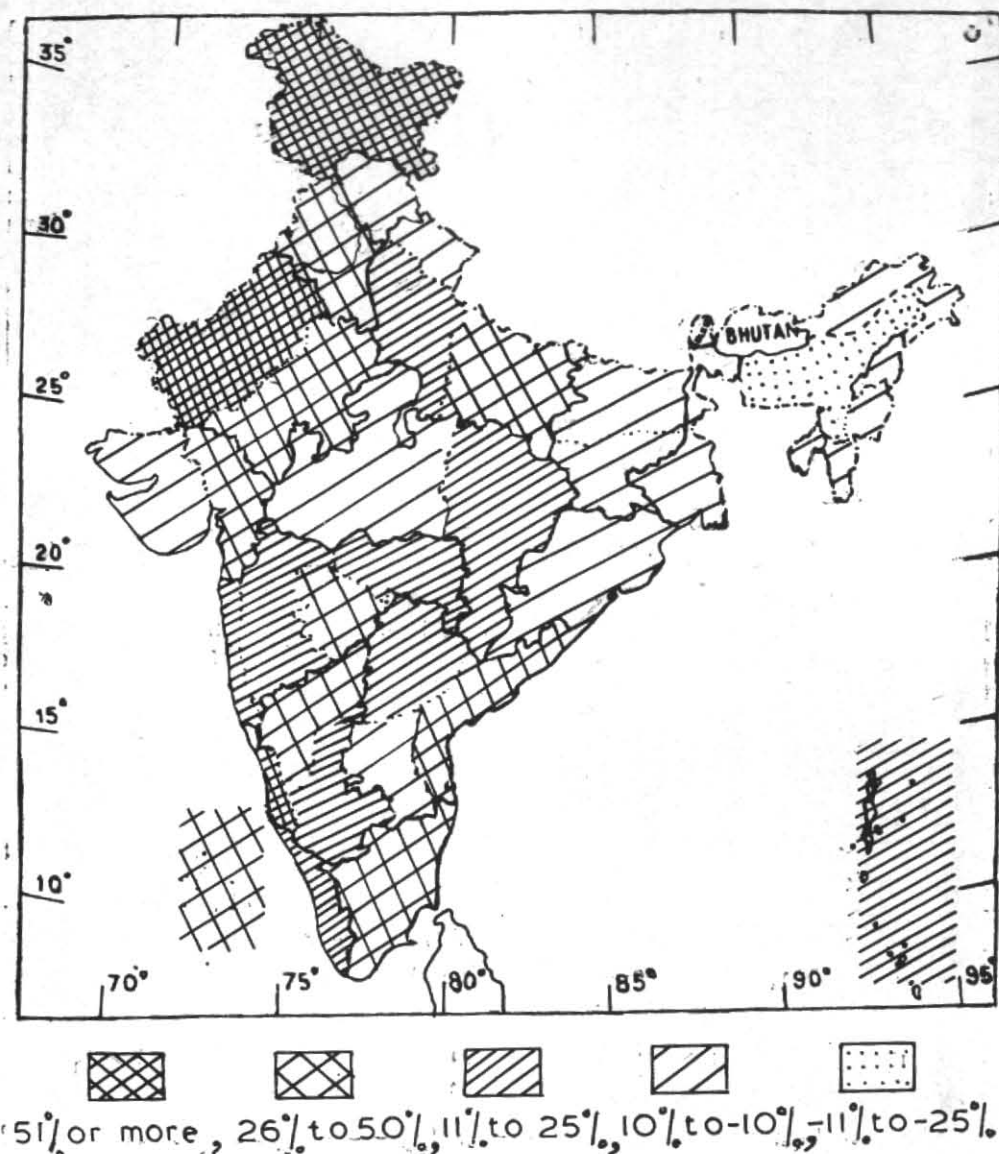


Fig. 2(a). Rainfall for the period 1 June to 30 September 1975  
(Percentage departure from normal)

from north Bay to northwest Madhya Pradesh and adjoining Rajasthan between 8th and 12th; and the fourth from west central and adjoining northwest Bay to southeast Madhya Pradesh and Vidarbha on 30th and 31st.

(iii) A low lay over Bihar and adjoining West Bengal on 16th and 17th, concentrated into a deep depression on 18th, moved to north Rajasthan by 22nd and weakened over Punjab on 23rd.

(iv) A cyclonic circulation in the middle troposphere moved westwards across north Peninsula from 1st to 5th.

(v) A well marked north-south trough in the lower troposphere lay over the Peninsula from 18th to 27th.

(vi) A trough of low persisted off Tamil Nadu-Sri Lanka coasts from 20th to 26th.

(vii) A cyclonic circulation in the middle troposphere moved from south Tamil Nadu to Lakshadweep and thence to off Karnataka-Maharashtra coasts between 24th and 28th.

(viii) The axis of the entire monsoon trough lay close to the foot of the Himalayas from 24th to 28th. Its eastern half remained north of the

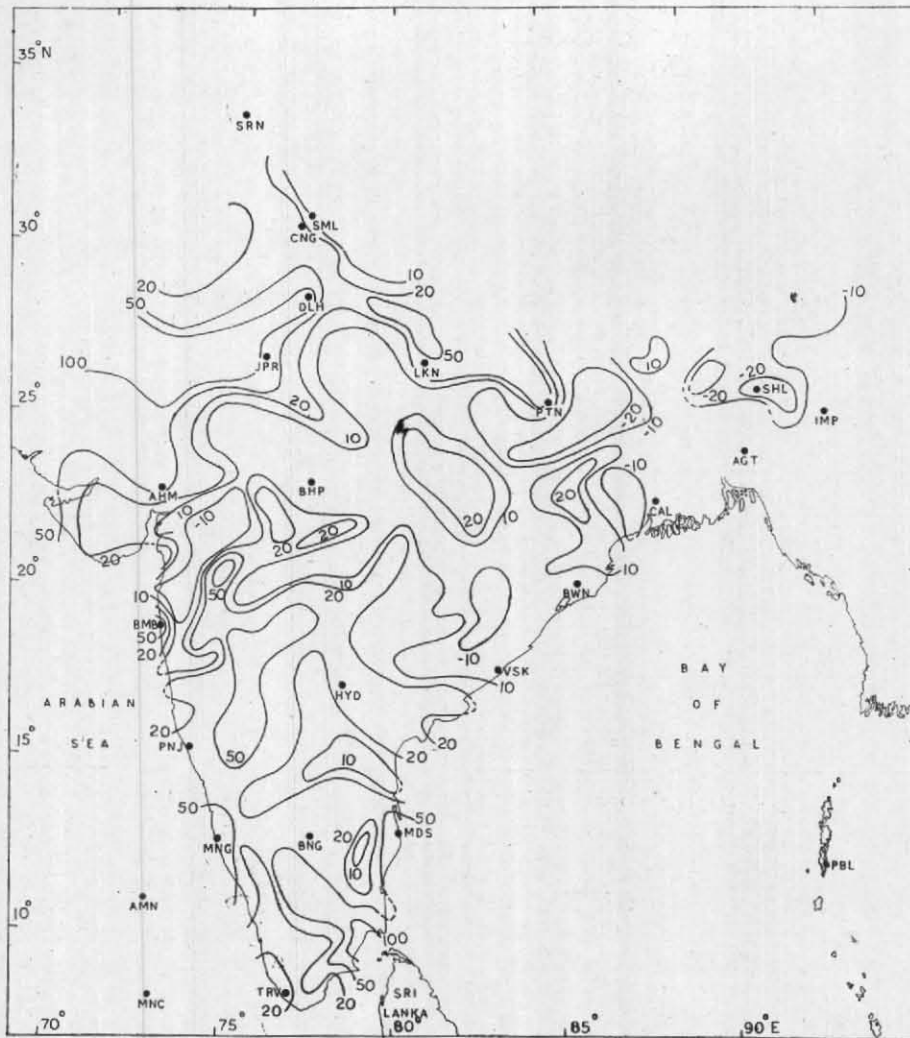


Fig. 2(b). Percentage departure from normal of rainfall during 1 June to 30 September 1975

normal position passing through Bihar Plains and Assam and adjacent States on most days between 11th and 23rd.

(ix) The seasonal low over northwest India was well marked from 8th to 16th.

(x) Five western disturbances moved eastwards across the western Himalayas as upper air troughs during the month.

According to press reports, Assam and adjacent States, West Bengal, north Bihar, east Uttar Pradesh, Punjab, Jammu & Kashmir and some parts of Rajasthan and Madhya Pradesh were affected by floods which dislocated communications and damaged crops and houses in these areas. Floods also disrupted road communications in some parts of Karnataka in the second week. A cloud burst caused some loss of life and damage to crops and houses in Sirmur district in Himachal Pradesh

in the third week. Bombay (Colaba) recorded an exceptionally heavy fall of 42 cm on 31 July, which paralysed normal life of the city.

The principal amounts of heavy rainfall (20 cm and above) during the month were :

Cherrapunji 24 on 3rd; Bahraich 20 on 5th, Bombay (Santacruz) 22 on 9th; Mahabaleshwar 31, Yellapur and Mangaon 20 each on 10th; Mahabaleshwar 31 on 11th; Cherrapunji 24 and Reasi 20 on 16th; Nagaur 22 on 17th; Ajmer 28, Shahjahanpur 23, Varanasi AP 22 on 18th; Cherrapunji 25 on 20th; Cherrapunji 30 on 21st; Gurudaspur 20 on 23rd; Cherrapunji 30 on 25th; Cherrapunji 34 on 26th; Cherrapunji 38 and Ramnagar 21 on 27th; Cherrapunji 22 on 28th; Mangaon 32 and Harnai 23 on 29th; Mangaon 20 on 30th; and Bombay (Colaba) 42, Alibag 29 and Bombay (Santacruz) 22 on 31st.

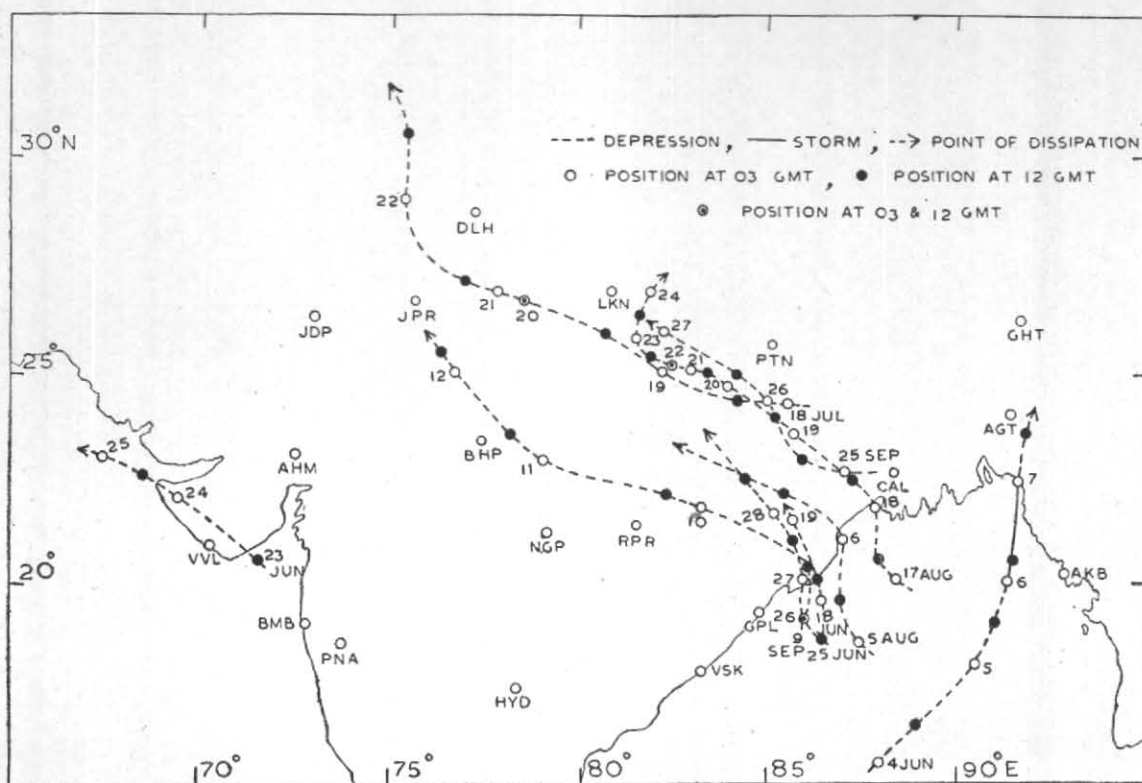


Fig. 3. Tracks of storms and depressions during June to September 1975

#### AUGUST

The monsoon was active or vigorous in Konkan on most days and in interior Maharashtra for 6 to 8 days in the first fortnight and again over these areas on 27th and 28th, in coastal Karnataka, Kerala, Gujarat Region, Madhya Pradesh, Orissa, Haryana and Punjab for 10 to 12 days in the month and in Gangetic West Bengal, plains of Uttar Pradesh and east Rajasthan for about a week in the month. The monsoon was generally weak in the Peninsula from 21st to 26th and in northwest India from 25th to 27th.

The activity of the monsoon was associated mainly with the following systems :

(i) A trough of low lay off the west coast of India from 1st to 4th, 9th to 22nd and 28th to 31st and was well marked on some days.

(ii) The entire monsoon trough was south of its normal position generally from 7th to 15th. Its eastern half was south of its normal position in the first week and north of the normal position and nearly close to the foot of the Eastern Himalayas from 21st to 25th. The western half was close to the foot of the Western Himalayas from 24th to 27th.

(iii) Two depressions moved westwards across north India—the first moved from northwest Bay

to northeast Madhya Pradesh between 5th and 7th and merged with the monsoon trough on 8th and the second was a deep depression which moved from north Bay to northeast Uttar Pradesh between 17th and 24th and merged with the monsoon trough on 24th evening.

(iv) The low which lay over Vidarbha and adjoining southeast Madhya Pradesh on 31 July, persisted there on 1 August and merged with the monsoon trough on 2nd. Four more lows moved in the monsoon trough—one from Gangetic West Bengal to south Rajasthan and adjoining Gujarat from 8th to 13th; another from northwest Bay to Rajasthan from 12th to 16th; the third from north Bay to Orissa between 26th and 28th; and the fourth from north coastal Andhra Pradesh to southwest Rajasthan and adjoining Gujarat from 27th to 29th and thence to northeast Arabian Sea by 31st. A trough extended from this low to west central Bay across north Peninsula from 28th to 30th.

(v) A cyclonic circulation extending to the middle troposphere moved from central Uttar Pradesh to Punjab and adjoining north Rajasthan between 3rd and 6th.

(vi) A cyclonic circulation extending to the middle troposphere lay over Gujarat State and neighbourhood from 8th to 15th.



(vii) A trough in the lower troposphere moved from southwest Bay to Tamil Nadu from 20th to 22nd. Another trough extending to the middle troposphere lay over southwest and adjoining west central Bay off Tamil Nadu-Andhra coasts from 24th to 27th.

(viii) Nine western disturbances moved eastwards across the Western Himalayas during the month—five in the first half and four in the second half. Another one was affecting Jammu & Kashmir on 31st.

(ix) The seasonal low over west Rajasthan was well marked from 7th to 13th with a trough extending to Gujarat State on 8th and 9th.

According to press reports, serious floods affected north Bihar during major part of the month, dislocating communications and damaging crops and houses. The flooded *Sone* and the *Ganga* inundated vast areas in and around Patna in the last week and all communications with Patna remained cut off for many days. All Government offices and business establishments in the city were closed. 3 lakh people of the city were reported trapped in 1 to 3 metre depth of water. Most of the people in the city had to take shelter on the roofs of their houses.

Floods were also reported from many districts in east Uttar Pradesh, some parts of Assam and adjacent States and east Rajasthan in the first week. Floods also disrupted road and rail communications in Madhya Pradesh in the second and last week. The flooded *Jhelum* submerged some villages in Srinagar district and dislocated traffic on Srinagar-Jammu highway towards the end of the month. Floods also affected some parts of Marathwada, Vidarbha and Gujarat State towards the end of the first week and north Orissa and Gangetic West Bengal in the second and third week. Penukonda and Hindupur taluks of Anantapur district in Andhra Pradesh were flooded due to a cloud burst leading to some damage to houses and loss of cattle in the last week of August.

The principal amounts of heavy rainfall (20 cm and above) over the country during the month were :

Agumbe 20 on 8th, Dharmpur 24 on 11th, Agumbe 20 on 12th; Rajahmundry 22, Gandhinagar 21 and Ahmedabad 20 on 13th; Betul 23 on 14th; Mangalore 22 on 17th; Baripada 27, Anandpur (Orissa) 24 and Balasore 22 on 19th; Jharsuguda 26 on 20th; Baikunthpur 21 on 21st; and Cherrapunji 27 and Umaria 26 on 22nd.

#### SEPTEMBER

The monsoon was active or vigorous in west Uttar Pradesh, Himachal Pradesh, Haryana, Punjab, Rajasthan and Gujarat State for 6 to 9 days from 1st to 17th; in Maharashtra State for 10 to 12 days; in Orissa, Andhra Pradesh, Karnataka and Kerala for 6 to 9 days; and in Madhya Pradesh, east Uttar Pradesh, West Bengal and Assam and adjacent States for 4 to 5 days in the month. The monsoon was weak in northeast India, Gujarat State and some parts of northwest India between 18th and 24th and in Maharashtra State between 12th and 16th.

The activity of the monsoon in the different parts of the country was associated mainly with the following systems :

(i) A trough of low lay off the west coast on most days in the first and last week. It extended into Gujarat State on some days in the first week. In this trough a low developed off Maharashtra coast on 29th and persisted there on 30th.

(ii) A low which was off coastal Orissa on 7th, concentrated into a depression on 9th, moved to Rajasthan by 12th weakened and merged with the seasonal low on 15th.

(iii) Another depression moved from Gangetic West Bengal to east Uttar Pradesh between 25th

and 27th. It was deep on 25th and 26th. It weakened over east Uttar Pradesh on 27th evening. But the associated cyclonic circulation in the lower troposphere moved to Haryana on 30th. From this system, a trough upto 4.5 km a.s.l. extended to Maharashtra State across Madhya Pradesh from 24th to 30th.

(iv) A low lay over south Uttar Pradesh and adjoining northwest Madhya Pradesh from 1st to 3rd with a trough extending to coastal Andhra Pradesh in the lower troposphere.

(v) A low moved from south coastal Orissa to west Madhya Pradesh from 3rd to 4th and merged with the monsoon trough on 5th.

(vi) A cyclonic circulation in the lower troposphere lay over Haryana and neighbourhood from 7th to 10th and again from 15th to 18th.

(vii) The eastern half of the monsoon trough passed through Bihar Plains, Sub-Himalayan West Bengal and Assam from 13th to 18th with a cyclonic circulation upto 4.5 km a.s.l. over Sub-Himalayan West Bengal and adjoining Assam.

(viii) A low moved from Andaman Sea to south Peninsula between 12th and 16th and thence to east central Arabian Sea off Karnataka-south

Maharashtra coasts by 19th and weakened on 20th.

(ix) A cyclonic circulation extending to the middle troposphere developed over Tamil Nadu on 20th, moved to north Lakshadweep and adjoining coastal Karnataka by 23rd and weakened by 25th. A trough in the lower troposphere extended from this system into interior Maharashtra between 21st and 23rd.

(x) A well marked trough in the lower troposphere extended from Andhra Pradesh to Andaman Sea from 25th to 30th.

(xi) Eight western disturbances moved eastwards across the Western Himalayas upto 24th.

According to press reports, many rivers in Uttar Pradesh were in spate in the first week and there was some loss of life in Bulandshahr town due to flash floods. Some districts in Punjab were affected by floods causing damage to crops. The flooded *Godavari* and *Purna* inundated vast areas in Nanded and Parbhani districts, causing damage to crops and other property in the first week. Floods were also reported from some parts of upper Assam. Bhopal and Indore divisions of Madhya Pradesh and some districts of north Gujarat

were affected by floods in the second and third weeks leading to the disruption of road and rail communications and some damage to crops and houses. Some northern districts of Bihar were also affected by floods. Very heavy rain in Patna on 27th and 28th paralysed the normal city life.

The southwest monsoon withdrew from west Rajasthan on 23rd, from Punjab and Jammu and Kashmir on 24th and from Himachal Pradesh, Haryana, Delhi and northeast Rajasthan on 25th. The withdrawal of the monsoon from these areas was delayed by about a week. However, some parts of northwest India experienced scattered or isolated rain or thundershowers on a few days between 25th and 30th in association with two western disturbances that moved across the Western Himalayas during this period.

The principal amounts of heavy rainfall (20 cm and above) over the country during the month were :

Kuttiyadi 25 on 10th; Kannod 28 on 21st; Gandhinagar 31 and Ahmedabad 20 on 13th; Patan 20 on 14th; Agumbe 24 and Peermedu 23 on 26th; and Dholi (Bihar) 31 and Minapur (Bihar) 30 on 27th.