

# Weather

## POST MONSOON SEASON (OCTOBER — DECEMBER 1969)

### INTRODUCTION

The southwest monsoon which had withdrawn from northwest India, Uttar Pradesh, Madhya Pradesh, Gujarat and Maharashtra States by the end of September withdrew rapidly from the rest of the country outside south Peninsula by 5 October, about 10 days ahead of the normal date.

Four cyclonic storms and a depression formed in the Bay of Bengal during this season. Their tracks are shown in Fig. 1. Of these the cyclonic storm which affected coastal Andhra Pradesh by the end of the first week of November was a severe one and it caused heavy damage to life and property in East and West Godavari and Krishna districts. In addition to the cyclonic storms and depression, a number of low pressure areas moved across the Peninsula causing good rainfall in the Peninsula outside Maharashtra State, resulting in an excess of rainfall in Tamil Nadu and Andhra Pradesh for the season.

Eight western disturbances affected the northern parts of the country during the season, four in October, two in November and two in December. Their activity was sub-normal in December. The rainfall in northwest India associated with these was generally scanty during this season.

The southwest monsoon which had withdrawn from northwest India, Uttar Pradesh, Madhya Pradesh, Gujarat and Maharashtra States by the end of September withdrew rapidly from northeast India and the Peninsula north of Lat. 15°N by 5 October, about 10 days ahead of the normal date.

A low pressure area moved westwards from Andaman Sea to the south Peninsula in the first week and moved further westwards to the central parts of the Arabian Sea by 11th and weakened by the next day. This system caused fairly widespread rain with isolated heavy falls

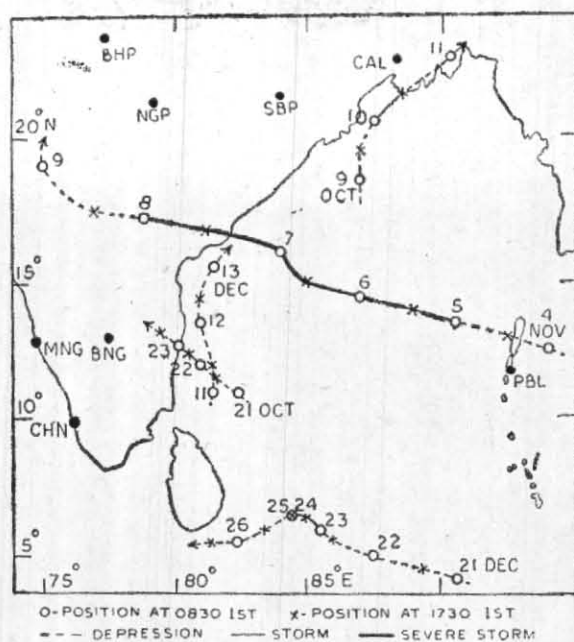


Fig.1. Tracks of storms/depressions during October-December 1969

The percentage departure of the total rainfall for the period 1 October to 31 December 1969 from the normal is shown in Figs. 2 (a) and 2 (b).

The detailed features are given below month by month.

### OCTOBER

in the Bay Islands in the first week and in the south Peninsula from 7th to 11th with the rain belt extending northeastwards to Andhra Pradesh and Orissa.

A low pressure area formed in southwest Bay on 13th, persisted there and became well marked on the morning of 16th. It moved into the interior parts of Tamil Nadu on that evening and weakened on the next day. Another low pressure area developed over Laccadives and adjoining east central Arabian Sea off Kerala-Mysore coasts on 15th, slowly moved northwestwards into east central

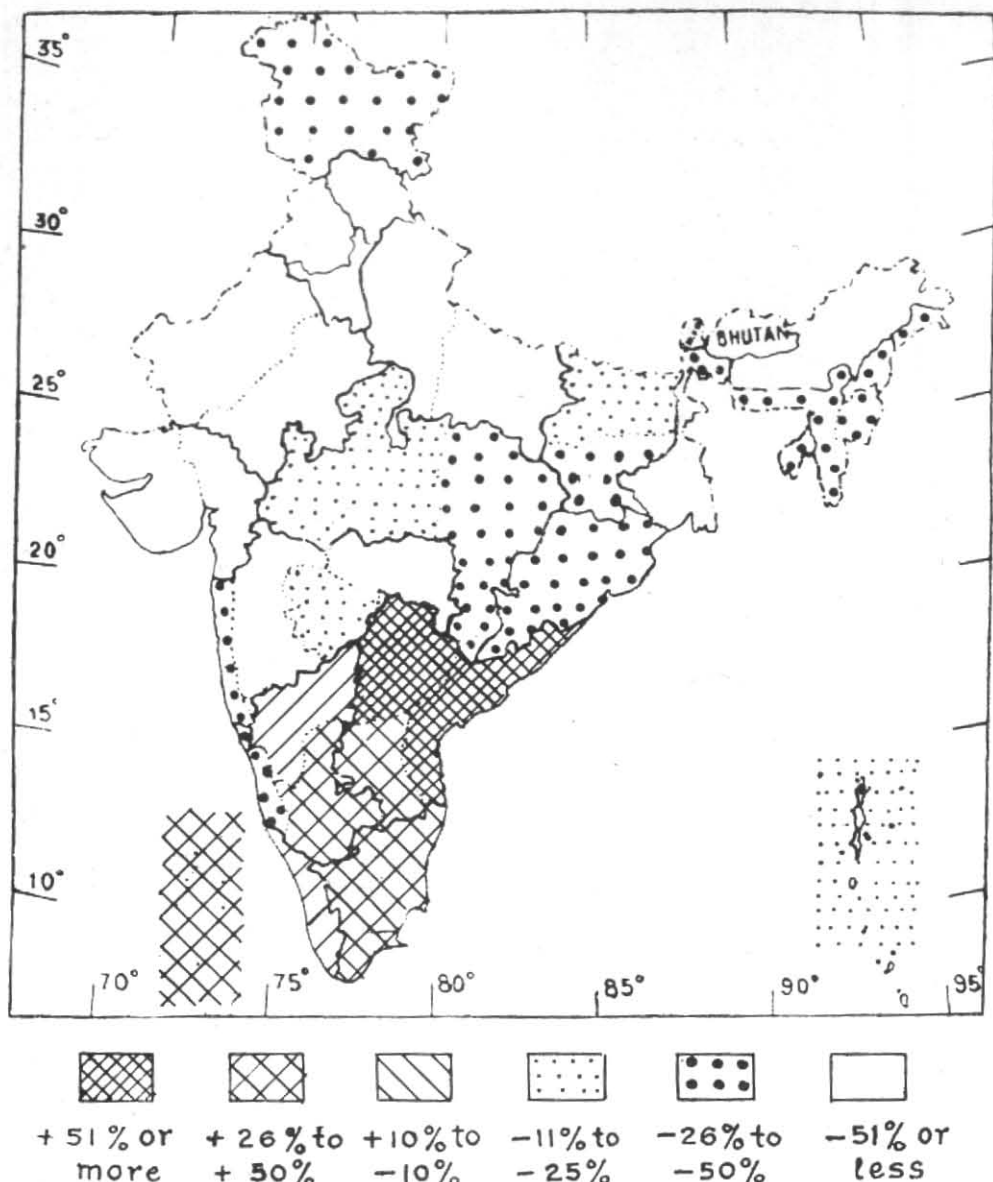


Fig. 2(a). Rainfall for the period 1 October to 31 December 1969  
(Percentage departure from normal)

Arabian Sea off Mysore-Goa-south Maharashtra coasts by 18th, persisted there till 20th, moved westwards to the central Arabian Sea on 21st and became less marked on the next day. Associated with these two systems, there was fairly widespread rain in the Peninsula with scattered heavy to very heavy falls in Andhra Pradesh and Tamil Nadu between 14th and 20th and scattered rainfall in Maharashtra State from 17th to 21st. According to press reports, the heavy rains in Andhra Pradesh resulted in very heavy damage to standing crops in Krishna and Guntur districts, the worst affected being Divi and Repalle taluks. Thousands of houses were either collapsed or damaged.

The noteworthy amounts of rainfall were : On 16th, 18 cm at Ongole, 16 cm at Nellore, 12 cm at Masulipatam, 11 cm at Cuddalore and 10 cm at Madras Airport and Trivandrum; On 17th, 21 cm at Masulipatam, 17 cm at Gannavaram and 13 cm at Kallakurichchi; On 18th, 10 cm at Ongole and on 19th, 10 cm at Shimoga.

A low pressure area moving westwards across south and adjoining central Bay from 19th, concentrated into a depression on the morning of 21st about 300 km southeast of Madras. Intensifying into a cyclonic storm on that night and moving northwest, it crossed north Tamil Nadu coast on the morning of 23rd about 30 km south of Madras and weakened into a depression on that evening and then into a low pressure area over

Rayalaseema and adjoining south Interior Mysore on 24th. This low pressure area emerged into the east central Arabian Sea off Mysore-Goa-south Maharashtra coasts on 25th and slowly moved away westwards. This system caused fairly widespread rain in Andhra Pradesh, Tamil Nadu and Mysore State with isolated heavy to very heavy falls in Andhra Pradesh and Tamil Nadu and scattered rainfall in Kerala during the period 21st to 25th and scattered rainfall in Konkan and Madhya Maharashtra from 26th to 28th.

The rainfall of 23 cm at Madras Airport on 22nd almost touched the 81-year old record of 23.4 cm at that place. On the same day, Tambaram near Madras recorded 29 cm and Sholavaram 48 cm. According to press reports, the torrential rain in Madras City and neighbourhood paralysed the city life, left more than 20,000 slum-dwellers homeless and caused breaches in the railway lines on the Madras-Arkonam section. However, it relieved the water scarcity in Madras City.

A low pressure area which was lying over Andaman Sea on 26th moved westwards across Comorin-Maldives area to southeast Arabian Sea by the end of the month causing fairly widespread rain in the Bay Islands and scattered rain in the south Peninsula during this period.

A depression formed in west central and adjoining northwest Bay on 9th, about 500 km south-southwest of Calcutta, moved north, intensified into a cyclonic storm on the next day and then

moving northeastwards crossed East Pakistan coast and lay as a depression near Barisal on the morning of 11th and later weakened into a low pressure area. This system caused good rainfall in northeast India between 9th and 12th.

Four western disturbances moved across the Western Himalayas as upper air cyclonic circulations or troughs in the lower and middle troposphere during this month causing light to moderate precipitation in that area, the first during the period from 1st to 3rd, the second from 10th to 13th, the third from 14th to 16th and the fourth from 27th to 29th. Jammu and Kashmir had an excess of rainfall for the month.

The daily maximum temperature was generally above normal (1) in northwest India, Gujarat State and Madhya Pradesh on most of the days, being appreciably so in many parts of Gujarat State, Rajasthan and west Madhya Pradesh; (2) in Maharashtra State in the first fortnight; and (3) in some parts of northeast India in the first and last week. It was below normal in northeast India on some days in the second week and appreciably below normal in Andhra Pradesh, Tamil Nadu and Interior Mysore on many days between 16th and 25th.

The daily minimum temperature was generally above normal in many parts of northwest India from 12th to 31st, being appreciably so during the last 10 days. It was below normal in west Madhya Pradesh and Vidarbha upto 5th.

#### NOVEMBER

A low pressure area which moved from the east into north Andaman Sea on 31 October moved further westwards into southeast Bay and adjoining central Bay by 2 November and became less marked on 3rd.

Another low pressure area which moved into north Andaman Sea on 2nd evening, concentrated into a depression on the morning of 4th about 200 km northeast of Port Blair. Moving westnorthwestwards, it intensified into a cyclonic storm on the morning of 5th about 300 km northwest of Port Blair. Continuing to move practically westnorthwest, it intensified further into a severe cyclonic storm on the morning of 6th and was centred near Lat.  $14.5^{\circ}\text{N}$  and Long.  $87.0^{\circ}\text{E}$ . Associated with the two systems mentioned above, the Bay Islands had widespread rain with isolated heavy falls from 1st to 7th.

The severe cyclonic storm continued to move practically westnorthwestwards and crossed Andhra

coast between Kakinada and Masulipatam on the 7th afternoon. Then moving across Telengana as a cyclonic storm and across north Interior Mysore and Madhya Maharashtra as a depression, it was centred near Ahmednagar on the morning of 9th. It weakened into a low pressure area over north Maharashtra State and adjoining Gujarat State and Madhya Pradesh on that evening, recurved and moved eastwards across Madhya Pradesh and was lying as an extended low pressure area from east Madhya Pradesh to East Pakistan on 12th. This system caused fairly widespread rain in north Peninsula, Madhya Pradesh, Uttar Pradesh and northeast India and scattered rain in Gujarat State and east Rajasthan in the second week.

The noteworthy amounts of rainfall were: On 7th, 10 cm at Visakhapatnam Airport; On 8th, 15 cm at Kalingsapatam, 11 cm at Masulipatam and 10 cm at Vijayawada and Kakinada; On 9th, 8 cm at Hanamkonda; On 10th, 9 cm at Sagar and Chapra; On 11th, 14 cm at Rajgarh and 10 cm at Purnea and Sidhi.

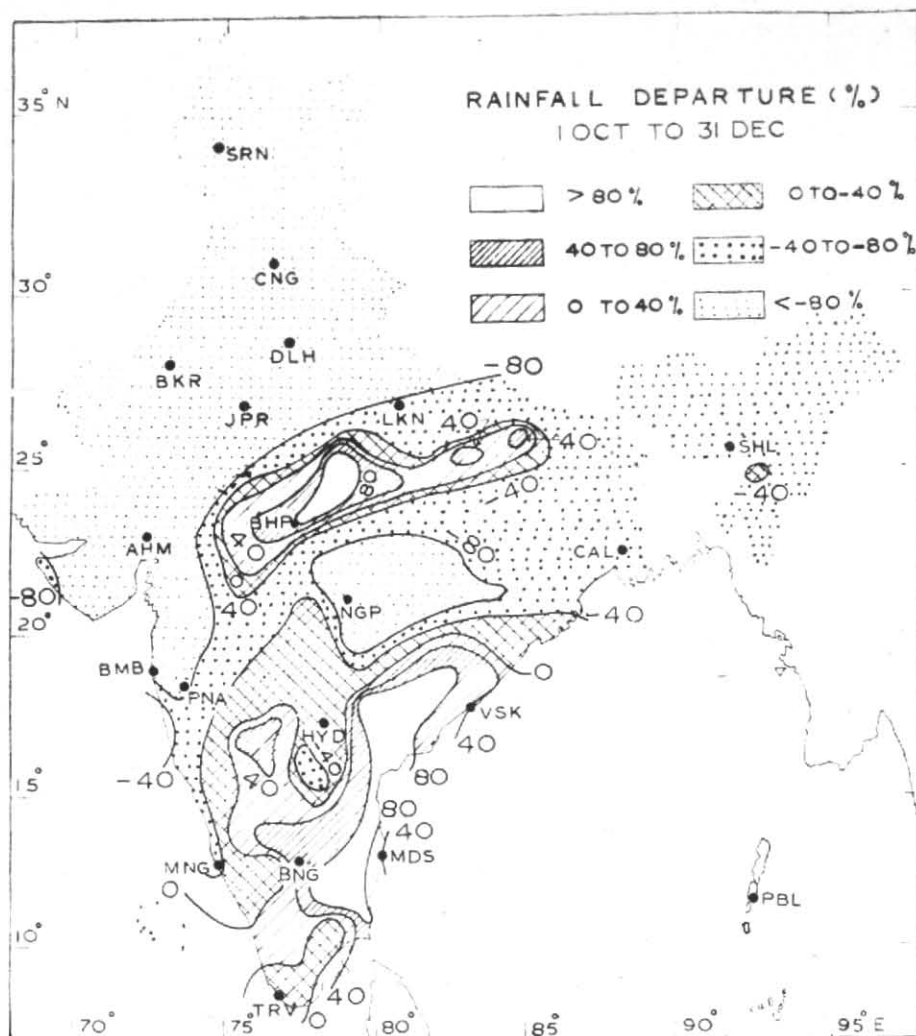


Fig. 2(b). Percentage departure from normal of rainfall occurred during the period  
1 October to 31 December 1969

According to press reports and the report of the officer who toured the storm affected areas of coastal Andhra Pradesh, the cyclonic storm took a toll of about 200 human lives and caused heavy damage to standing crops (particularly paddy and sugarcane) and to other property in Krishna, East and West Godavari districts of coastal Andhra Pradesh. The damage caused by this storm is reported to be heavier than that caused by the cyclone which hit Andhra Pradesh in May this year. The most gruesome tragedy was the death of 42 fishermen living in the Kolletikota Island hamlet in the Kolleru lake, which was washed away by a waterspout as the storm moved across the lake on

the evening of 7th. Tidal waves affected the coastal areas of Andhra Pradesh between Visakhapatnam and Coringa (near Kakinada). The maximum wind speed experienced at some places in east and west Godavari districts has been estimated to be of the order of 100 to 150 kmph. Gannavaram Observatory recorded a maximum wind speed of 98 kmph between 1950 and 2030 IST on 7th and a negative pressure departure of 23 mb on that evening. Kakinada Observatory recorded an average wind speed of 150 kmph on the afternoon of 7th. Some State rain gauge stations in these districts recorded rainfall ranging from 14 to 19 cm on 8th.

A feeble low pressure area was lying in east central Arabian Sea off the west coast with a trough extending northwards to Gujarat State and adjoining Rajasthan and west Madhya Pradesh from 13th to 16th. It caused good rainfall in south Peninsula and the Arabian Sea Islands and isolated light rain in Maharashtra State, west Madhya Pradesh and east Rajasthan during this period.

Two low pressure areas moved westwards from Andaman Sea to south Arabian Sea across extreme south Peninsula and Comorin-Maldives area in the second fortnight, the first one during the period 15th to 24th and the second during the period 23rd to 30th. As the first one moved across southwest Bay, a trough extended into west central Bay on Tamil Nadu-Andhra coasts and persisted from 19th to 24th. This system caused fairly widespread moderate to rather heavy rain in the Bay Islands from 15th to 20th, fairly widespread rain in south Peninsula from 18th to 25th with scattered heavy to very heavy falls in Tamil Nadu from 18th to 20th, isolated heavy to very heavy falls in coastal Andhra Pradesh on 21st and Kerala, south interior Mysore and the Arabian Sea Islands on one or two days.

The noteworthy amounts of very heavy rainfall were : on 18th, 20 cm at Pamban ; on 19th, 23 cm at Cuddalore, 21 cm at Pondicherry and Vedaranniyam, 15 cm at Nagapattinam, on 20th, 21 cm at Cuddalore, 20 cm at Pondicherry and 16 cm at Madras Airport ; on 21st 23 cm at Nellore and 11 cm at Trivandrum ; on 23rd, 13 cm at Shimoga and on 24th, 11 cm at Bangalore Central Observatory.

The second low pressure area caused scattered light to moderate rain in the Bay Islands from 24th to 26th and moderate to rather heavy rain in south Peninsula between 26th and 30th.

The trough in the lower troposphere which was lying over Gujarat State on 30 November 1969 caused scattered moderate rain in Gujarat State and isolated light rain in the adjoining areas of west Madhya Pradesh and east Rajasthan on 1st December. Baroda and Vallabh Vidyanagar recorded 3 cm of rain each on 1 December.

Associated with a trough of low pressure lying over Laccadives, there was good rainfall in Kerala and the Arabian Sea Islands on the first two days, Fort Cochin recording 7 cm of rain on 1st and Mini-coy 8 cm on 2nd.

A trough of low pressure moved from Andaman Sea to southwest Bay between 1st and 4th and persisted off Ceylon-Tamil Nadu coasts upto 6th.

A trough of low pressure which was extending from Laccadives to Maharashtra coast on 26th and 27th caused isolated light rain in Konkan and Madhya Maharashtra from 27th to 29th. A cyclonic circulation extending to about 1.5 km a.s.l. was lying over Gujarat region on 29th evening and weakened into a trough over Gujarat State on the next day causing fairly widespread light rain in Gujarat State and isolated light rain in the adjoining parts of Rajasthan and west Madhya Pradesh on 30th.

Two western disturbances affected northwest India as upper air troughs in the middle troposphere during the month. The first one moved across northwest India between 10th and 14th causing isolated light to moderate precipitation in the Western Himalayas and the adjoining plains during this period. Patiala recorded 4 cm of rain on 13th. The second western disturbance moved across Jammu and Kashmir between 19th and 23rd causing isolated snowfall in Jammu and Kashmir on 20th and 21st.

The daily minimum temperatures were above normal in many parts of north India and north Peninsula on most of the days in the first three weeks and in many parts of Madhya Pradesh, Gujarat State and the Peninsula in the last week, being appreciably to markedly so in many parts of Madhya Pradesh and adjoining parts of Rajasthan and of Uttar Pradesh and in many parts of Gujarat and Maharashtra States. They were below normal in south Madhya Maharashtra, Telangana, Rayalaseema and many parts of Mysore State and Tamil Nadu from 1st to 5th and in extreme northwest India and adjoining Uttar Pradesh in the last week.

#### DECEMBER

In this trough, a low pressure area developed over southwest Bay off Ceylon on 7th and persisted there till 10th. It then moved north and concentrated into a depression in the morning of 11th about 250 km southeast of Madras. Moving practically north, it was centred on the morning of 13th about 100 km southeast of Masulipatam. It weakened into a trough of low pressure on the 14th over west central and adjoining southwest Bay off Andhra-Tamil Nadu coasts, which persisted there for the next 3 days. Associated with these developments, there was a spell of good rainfall in Tamil Nadu and Andhra Pradesh from 12th to 18th and isolated rain in Orissa, east Madhya Pradesh and Vidarbha between 12th and 15th.

Some of the noteworthy amounts of heavy rainfall

were : on 12th, 17 cm at Nellore; on 13th, 14 cm at Masulipatam and 10 cm at Kakinada; on 14th, 10 cm at Atirampattinam and Jagdalpur; on 15th, 9 cm at Coimbatore AP and on 16th, 11 cm at Nagapattinam.

A low pressure area formed over southeast Arabian Sea and adjoining Laccadives on 5th evening, persisted there upto 8th and moved westwards to southeast and adjoining southwest Arabian Sea by 10th. It caused generally widespread moderate to rather heavy rain in the Arabian Sea Islands from 7th to 9th.

The low pressure area which was lying over southeast and adjoining southwest Arabian Sea on 10th moved eastnortheastwards to Laccadives and adjoining southeast Arabian Sea by 12th evening and became well marked. It moved further eastwards and was lying over Laccadive and adjoining Kerala coast on 15th with trough extending northwards to Maharashtra State. It weakened into a trough of low pressure off Kerala coast on 16th. This system caused generally widespread rain in Kerala and the Arabian Sea Islands from 13th to 15th, scattered rain in south Interior Mysore between 14th and 17th and scattered or isolated rain in coastal Mysore and Madhya Maharashtra on 16th.

A depression formed on 21st morning in extreme southeast Bay near Lat.  $4^{\circ}\text{N}$  and Long.  $90.5^{\circ}\text{E}$ . Moving northwest, it intensified into a cyclonic storm on 23rd morning with centre near Lat.  $6^{\circ}\text{N}$  and Long.  $85.5^{\circ}\text{E}$ . It remained practically stationary from 24th morning to 25th morning near Lat.  $6.5^{\circ}\text{N}$  and Long.  $84.5^{\circ}\text{E}$ . Then moving westsouthwest, it weakened into a depression on 25th evening near Lat.  $6^{\circ}\text{N}$  and Long.  $83.5^{\circ}\text{E}$ . Continuing to move in almost a westerly direction, it weakened further into a low pressure area over south Ceylon and adjoining Comorin area on 27th. This low pressure area persisted there on 28th and 29th and moved to Comorin and neighbourhood by the end of the month. Associated with this system, there was fairly widespread rain with

isolated very heavy falls in south Tamil Nadu between 28th and 31st.

The noteworthy amounts of rainfall were : on 28th, 27 cm at Velaranniyam, 13 cm at Nagapattinam and 8 cm at Atirampattinam; on 29th, 12 cm at Vedaranniyam; on 30th, 16 cm at Vedaranniyam and 13 cm at Nagapattinam and on 31st 9 cm at Vedaranniyam, Pamban and Nagapattinam.

Two feeble western disturbances moved across the Western Himalayas during this month. The first western disturbance moved across the Western Himalayas as an upper air trough in the middle and upper troposphere between 10th and 12th causing isolated light precipitation in Himachal Pradesh and the hills of west Uttar Pradesh on 11th. The second western disturbance which was lying over east Iran and adjoining Afghanistan on 28th moved across Jammu and Kashmir by 31st as an upper air trough in the middle troposphere, causing isolated light rain or snow in Jammu and Kashmir on 30th and 31st.

The daily minimum temperatures were generally above normal in north Peninsula, Gujarat State, west Madhya Pradesh and south Rajasthan on many days in the first fortnight, being appreciably to markedly so in many parts of Gujarat State and Madhya Maharashtra on many days and in west Madhya Pradesh and adjoining Rajasthan and in the interior parts of Andhra Pradesh and interior Mysore on a few days. They were also above normal in many parts of the Peninsula on many days in the third week. They were below normal in (1) Haryana, Punjab and Jammu and Kashmir on many days in the first, third and last week; (2) many parts of Madhya Pradesh and Uttar Pradesh in the second fortnight; (3) Gujarat State in the third week; and (4) in many parts of north Peninsula and northeast India in the last week, being appreciably so in many parts of Madhya Pradesh, Bihar State, Orissa and Telangana in the last week and markedly so in some parts of Orissa from 27th to 29th.

### Disastrous Weather Events of 1969

Every year some part of the country or other experiences unusually adverse weather conditions which bring disaster and misery to large sections of the community, disrupting their normal life and economy. Examples of such severe weather are—Cyclonic storms striking the coastal areas, tornadoes, severe thunder or hailstorms over North India, duststorms over Northwest India, heavy rains, floods and droughts, heat and cold waves and heavy snowfall in the northern areas, etc. The map (p. 314) presents in a pictorial form, such severe weather events of 1969, with their dates and months of occurrence.

Details of the disastrous Weather Events are —

#### *Tornado*

A tornado hit Diamond Harbour on the eastern bank of the river *Hooghly*, near Calcutta in the early hours of 21 March. It lasted for a brief spell of 10 min causing destruction and heavy damage along its path—a strip 15 km long and about 30m wide. A 36-seater bus with three persons in it, was reported to have been bodily lifted to a height of about 10 m.

#### *Thundersqualls*

Pronounced thunderstorm activity occurred in the south Peninsula from 6 to 12 April and again from 18 to 22 April. Heavy rains and severe squalls destroyed several huts, uprooted coconut trees and dislocated communications in north Calicut on the 20th.

#### *Snowstorms*

Srinagar experienced heavy snowfall and gale force winds on 29 and 30 April disrupting communications and causing heavy damage to fruit crops. Snowstorms hit many places in Himachal Pradesh and Punjab also on these days destroying fruit orchards estimated to be worth Rs. 3.5 crores.

Lahaul and Spiti valleys in Himachal Pradesh had heavy snowfall on 9 and 10 December. Key-long received 15 cm of snow and Kaza 7 cm.

#### *Hailstorms*

Hailstorms affected many districts of Uttar Pradesh in the first week of May, destroying or damaging the mango and melon crops.

#### *Duststorms*

Severe duststorms in west Rajasthan on 21 and 22 June dislocated rail traffic between Jodhpur and

Barmer. Rail tracks were covered with sand 3 ft deep at some places.

#### *Cyclonic Storms*

A cyclonic storm from the Bay of Bengal struck south Andhra coast on 17 May. Under its influence, torrential rains and gales lashed the districts of Guntur, West and East Godavari and adjoining Khammam causing unprecedented floods resulting in considerable loss of life and property and disrupting communications. The cyclonic storm reportedly took a toll of over 600 human lives and few lakhs heads of cattle, and submerged vast areas of rich standing crops. The total loss was estimated at more than Rs. 100 crores.

Another cyclonic storm hit Andhra coast on 7 November bringing death and devastation in the coastal districts of West and East Godavari, Krishna and Visakhapatnam. 168 human lives were reported to have been lost and crops worth several crores of rupees damaged. Total loss was estimated at Rs. 110 crores. 46 persons were said to have lost their lives in a waterspout over Kolleru lake in Kaikalur taluka of Krishna district. The dead were mostly fishermen.

#### *Floods*

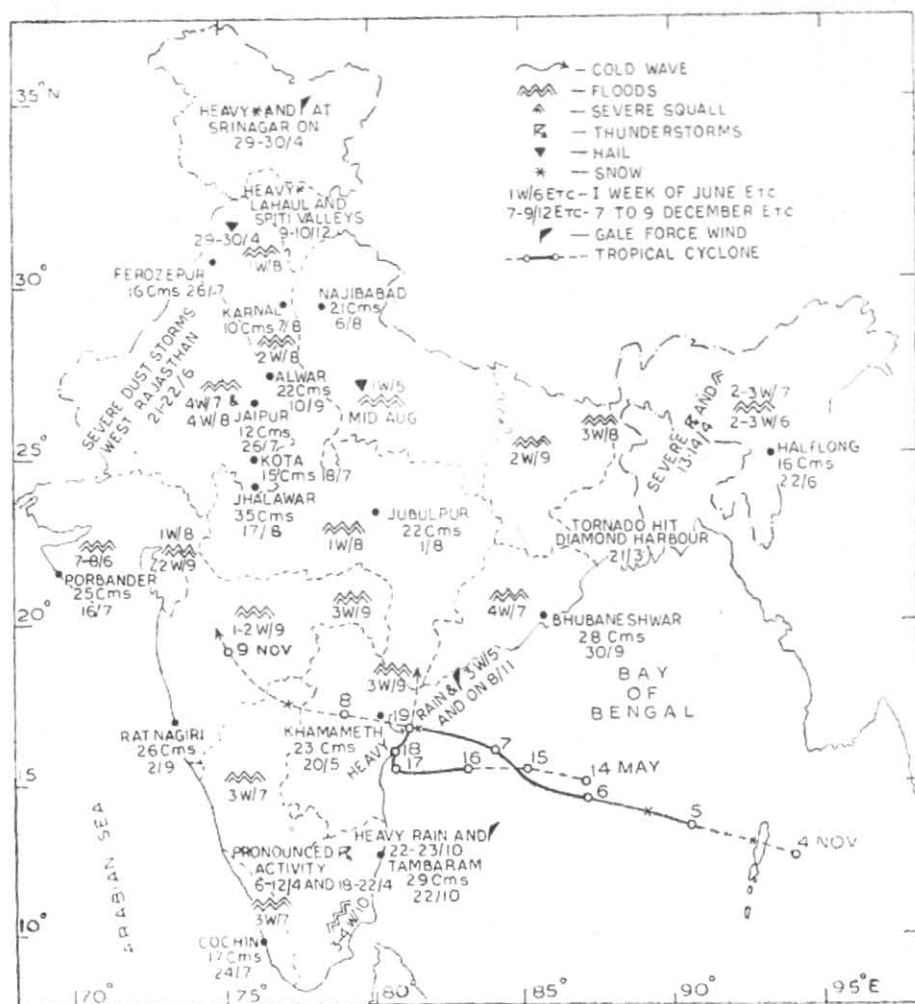
Floods in Assam in the 2nd and 3rd weeks of June and July rendered 5 lakhs of people homeless and inundated vast areas of jute and paddy crops.

Floods occurred in Mysore and Kerala in the 3rd week of July and in Orissa and northeast Rajasthan in the last week.

Floods in the *Narmada*, *Tapti* and *Wainganga* in the 1st week of August inundated vast areas and paralysed road traffic in Madhya Pradesh.

Heavy rains in Himachal Pradesh and the hills of west Uttar Pradesh on 2 and 3 August disrupted telecommunications and road traffic in the Mandi region of Himachal Pradesh and caused floods in the *Beas* and *Ravi* inundating vast areas in Hoshiarpur, Kapurthala and Gurdaspur districts of Punjab.

Heavy rains in the various parts of north India during the first three weeks of August caused floods in most of the rivers there, affecting vast areas in Uttar Pradesh, Bihar, north Bengal, Assam and Rajasthan. The *Jamuna* flooded many villages near Delhi.



Disastrous Weather Events of 1969

Floods in north Maharashtra in the first half of September caused extensive damage to agricultural lands and properties, destroying standing crops estimated to be worth Rs. 4 crores. More than 1,05,000 people were reported to be rendered destitute.

Floods occurred in south Gujarat in the 1st week of August and again in the 2nd week of September, and in Vidarbha and Telangana in the 3rd week of September.

Torrential rain accompanied by high winds lashed Madras City and suburbs on 22nd and 23 October affecting air and train services and throwing the normal life of the city out of gear. Meenam-

bakkam received 23 cm of rain on 22nd almost touching the 81-year old record of 23.4 cm on October 31, 1888. Tambaram and Sholavaram, two other suburbs of Madras, recorded 29 and 48 cm of rain on that day.

There were heavy rains in other parts of Tamil Nadu also in the 3rd and 4th weeks of October causing flooded rivers and breached tanks, destroying food crops, rendering thousands of persons homeless and disrupting rail and road traffic in the affected areas. Nearly 40,000 hectares of land with standing rice crop were reported to have been under water in Thanjavur district, the rice bowl of Tamil Nadu.