

## Weather

### POST MONSOON SEASON (OCTOBER-DECEMBER 1972)

#### CHIEF FEATURES

##### *Cyclonic storms/depressions*

Two severe cyclones and four depressions formed in the Bay of Bengal and one severe cyclone and one depression in the Arabian Sea during this period. Their tracks are shown in Fig. 1. Of these, the severe cyclone which hit Tamil Nadu coast near Cuddalore on 6 December, caused considerable damage to crops and other property in many districts of Tamil Nadu and some loss of life. The severe cyclone which struck Sriharikota Island on 22 November also caused some damage to property in that area.

##### *Monsoon and rainfall*

The southwest monsoon withdrew from West Bengal, Orissa and Assam and adjacent States in the first week of October and from Andhra Pradesh, Mysore State, Tamil Nadu and Kerala during the second week of October. The rainfall during this season was normal to excess in the Peninsula outside Maharashtra and Gujarat States, where it was generally scanty. It was normal in Bihar, east Uttar Pradesh and east Madhya Pradesh and generally deficient over the rest of northeast India and west Madhya Pradesh. The

total rainfall over the country for the period 1 October to 31 December 1972 in terms of percentage departure from normal is shown in Fig. 2.

##### *Western disturbances*

Seventeen western disturbances moved across northwest India during this period, five in October, five in November and seven in December. The rainfall for this period associated with these systems was in excess in Jammu & Kashmir, Himachal Pradesh and Haryana, deficient in Punjab and west Uttar Pradesh and scanty in Rajasthan.

##### *Temperatures*

Day temperatures were appreciably above normal in Madhya Pradesh, Gujarat and Maharashtra States on many days in October.

Night temperatures were appreciably above normal in the interior parts of the Peninsula and many parts of north India during the last week of November and on many days in December. Moderate cold wave conditions prevailed in Kutch and Rajasthan on the last 2 days of December.

The important features of each month are detailed below.

#### OCTOBER

The southwest monsoon which had withdrawn from northwest India, Uttar Pradesh, Madhya Pradesh, Bihar, Gujarat and Maharashtra States by the end of September, withdrew further from the rest of northeast India by 3 October and from the rest of the Peninsula by 14 October.

Five western disturbances moved across northwest India during the month, two in the first fortnight and three in the second fortnight. Of these, the second, third and fourth disturbances caused good precipitation in the Western Himalayas and the adjoining plains, while the other two caused scanty rainfall in these areas. The rainfall during the month, associated with the western disturbances was in excess in Jammu & Kashmir and deficient or scanty over the plains of north India. The snowfall which occurred in Kashmir in the

third and last weeks of October, about a month earlier than normal, was reported to have caused some damage to standing crops.

A deep depression crossed south Andhra coast between Nellore and Ongole on the forenoon of 5th and weakened into a low over Telangana on the 6th. This low subsequently recurved north-eastwards to Bangla Desh across southeast Madhya Pradesh, north Orissa and Gangetic West Bengal by the 9th and dissipated. This system caused fairly widespread rain in the Bay Islands, the eastern half of the Peninsula, east Madhya Pradesh and northeast India on some days between 1st and 10th. There was also scattered isolated rain in interior Maharashtra State from 5th to 7th. Scattered heavy to very heavy rain which occurred in Andhra Pradesh between the 4th and 7th was

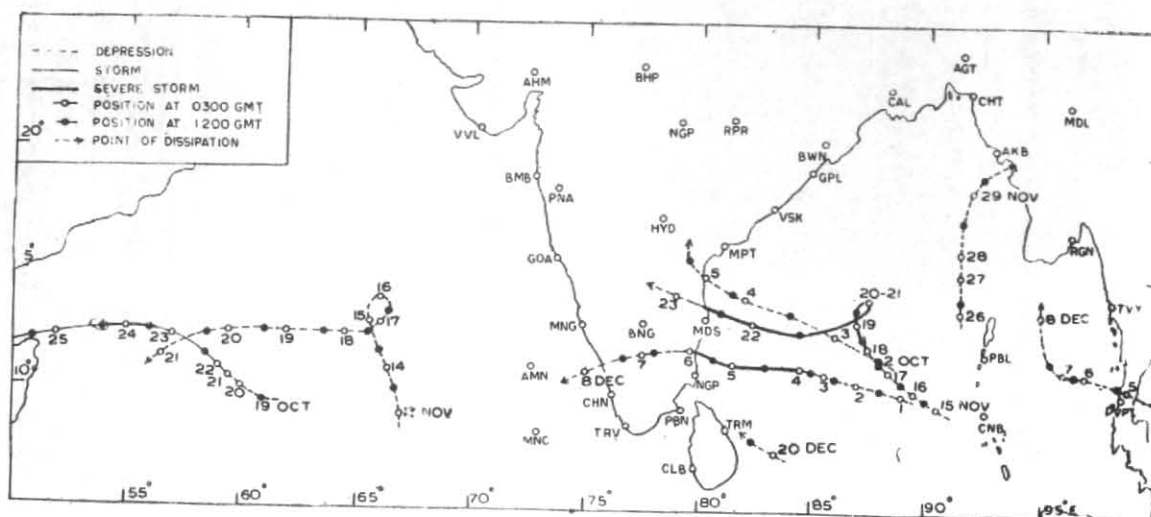


Fig. 1

Tracks of Storms and Depressions during October to December 1972

reported to have flooded many parts of east Godavari district damaging standing crops and rendering about 10,000 people homeless. Train services in this part of the South Central Railway was disrupted for a few days.

A low pressure area moving westwards from southeast Arabian Sea to southwest Arabian Sea concentrated into a depression on the 19th evening near 9.5° N, 61° E. Moving northwest, it became a severe cyclone by the 23rd and moved away westwards towards the Gulf of Aden. This system did not affect the weather over India.

A well marked trough of low that lay off the west coast of India from 6th to 8th caused fairly widespread rain in Kerala and Mysore States from 6th to 9th with scattered heavy falls in Kerala. In association with moving troughs in the low level easterlies, south Peninsula had a few spells of good rainfall in the latter half of the month leading to an excess of rainfall for the month as a whole in south Peninsula.

The principal amounts of heavy rainfall during the month were :

5	Kakinada	14
	Sulurpet	13
	Triupathi, Nellore	12 each
6	Bhimavaram	15
	Eluru	13
	Kakinada, Nidadavolu, Peddapuram	12 each
7	Nidadavolu	13
8	Malda, Farukhabad	11 each
9	Salem	10
16	Parur	13
18	Punalur	10
22	Palayankottai	15
26	Trivandrum	23
	Nagapattinam	12
27	Nagapattinam	18
	Nellore, Madras, Cuddalore	14 each
28	Ongole	17
	Pambam	14
29	Masulipatnam	18
	Yanam	17
	Parur	12
	Fort Cochin	10

Date	Station	Rainfall (cm)
2	Mangalore	11
	Hut Bay	10
4	Amalapuram (Coastal Andhra Pradesh)	14

Day temperatures were appreciably above normal in Madhya Pradesh, Gujarat and Maharashtra States on many days from 1st to 25th, being markedly so in Gujarat from 6th to 8th and in Madhya Maharashtra from 13th to 20th. Night temperatures were appreciably below normal in west Madhya Pradesh and Rajasthan from 1st to 4th and in Rajasthan on 23rd and 24th.

## NOVEMBER

Five western disturbances moved across north-west India during the month, three in the first half of the month and two in the last week. The last two western disturbances caused widespread rain and snow in the Western Himalayas and scattered to fairly widespread rain or thundershowers in the plains of northwest India and Uttar Pradesh in the last week. A well marked trough in the west-erlies which moved eastwards from Madhya Pradesh and Uttar Pradesh to Burma in the first week, caused good rainfall in Orissa on a day or two. The rainfall associated with the western disturbances for this month was in excess in the western Himalayas, Haryana, Punjab and Uttar Pradesh. Gopalpur recorded 9 cm of rain on the 4th, Varanasi 16 cm and Jaunpur 8 cm on the 26th and New Delhi 9 cm and Palam 8 cm on the 27th.

A depression developed over southeast Arabian Sea on the 13th near 9°N, 67°E. It moved north-northwest, became deep on the 15th and made a clock-wise loop in its track. Then it moved west-southwest towards Somalia coast and weakened into a low on the 22nd. This system did not affect the weather over India.

A deep depression formed in southeast Bay on the 15th and intensified into a severe cyclonic storm by the 18th. It also executed a clock-wise loop in its track and subsequently struck Sriharikota Island (between Nellore and Madras) on the early night of 22nd. It caused widespread rain in the Bay Islands from the 13th to 20th with scattered heavy falls between the 15th and 18th. Rainfall was also fairly widespread in coastal Andhra Pradesh and Rayalaseema and scattered in Tamil Nadu and Mysore State between 23rd and 25th, with isolated heavy to very heavy falls in coastal Andhra Pradesh. The cyclone uprooted a large number of giant trees all along the road from Gummidipundi to Sulurpet and damaged *casuarina* and *eucalyptus* plantations near Sriharikota. The road from Pulicat lake to Sriharikota Island was damaged at many places due to the choppy waves in Pulicat lake. In Sriharikota Island itself, a large number of telegraph posts and electric poles were bent in different directions and severely damaged. This cyclone weakened into a low over Rayalaseema and adjoining Mysore on the 24th. Subsequently it weakened into a trough over Maharashtra but the associated cyclonic circulation in the lower troposphere, moved northwards to Madhya Pradesh by the 26th and dissipated later. This low caused scattered rainfall in Maharashtra State, Madhya Pradesh and many parts of north-east India in the last week.

A low pressure area moving northnorthwest from Andaman Sea concentrated into a depression on the 26th near 13.5° N, 91.5°E. It became deep on the 27th and recurving northnortheastwards, it weakened into a low close to Arakan coast near Akyab on 29th late evening. This system did not affect the weather over the mainland but it caused fairly widespread rain in the Bay Islands from the 25th to 28th.

A well marked trough of low which lay off the Maharashtra coast on the 1st and 2nd and became less marked on the 3rd, caused a spell of good rainfall in Maharashtra State on the first 3 days. In association with the movement of some troughs in the low level easterlies, south Peninsula had a spell of good rainfall in the first week and on a few days in the second week.

The principal amounts of heavy rainfall over the country during this month in association with the above systems were :

Date	Station	Rainfall (cm)
1	Gannavaram	17
3	Manapparai	11
4	Alwaye	13
6	Nagappattinam	12
8	Trivandrum AP	10
14	Ponnani	12
15	Hut Bay	19
	Calicut	11
	Kondul	10
16	Port Blair	10
18	Port Blair	12
23	Venkatagiri	15
	Sulurpet	13
24	Madras	11
25	Rapur	13

Night temperatures were appreciably above normal in north Maharashtra, some parts of Gujarat State, southeast Madhya Pradesh and Orissa from 1st to 3rd, in Jammu & Kashmir from 9th to 12th, in west Rajasthan in the third week and generally over the country during the last week, being markedly above normal in some parts of Madhya Pradesh on many days in the last week.

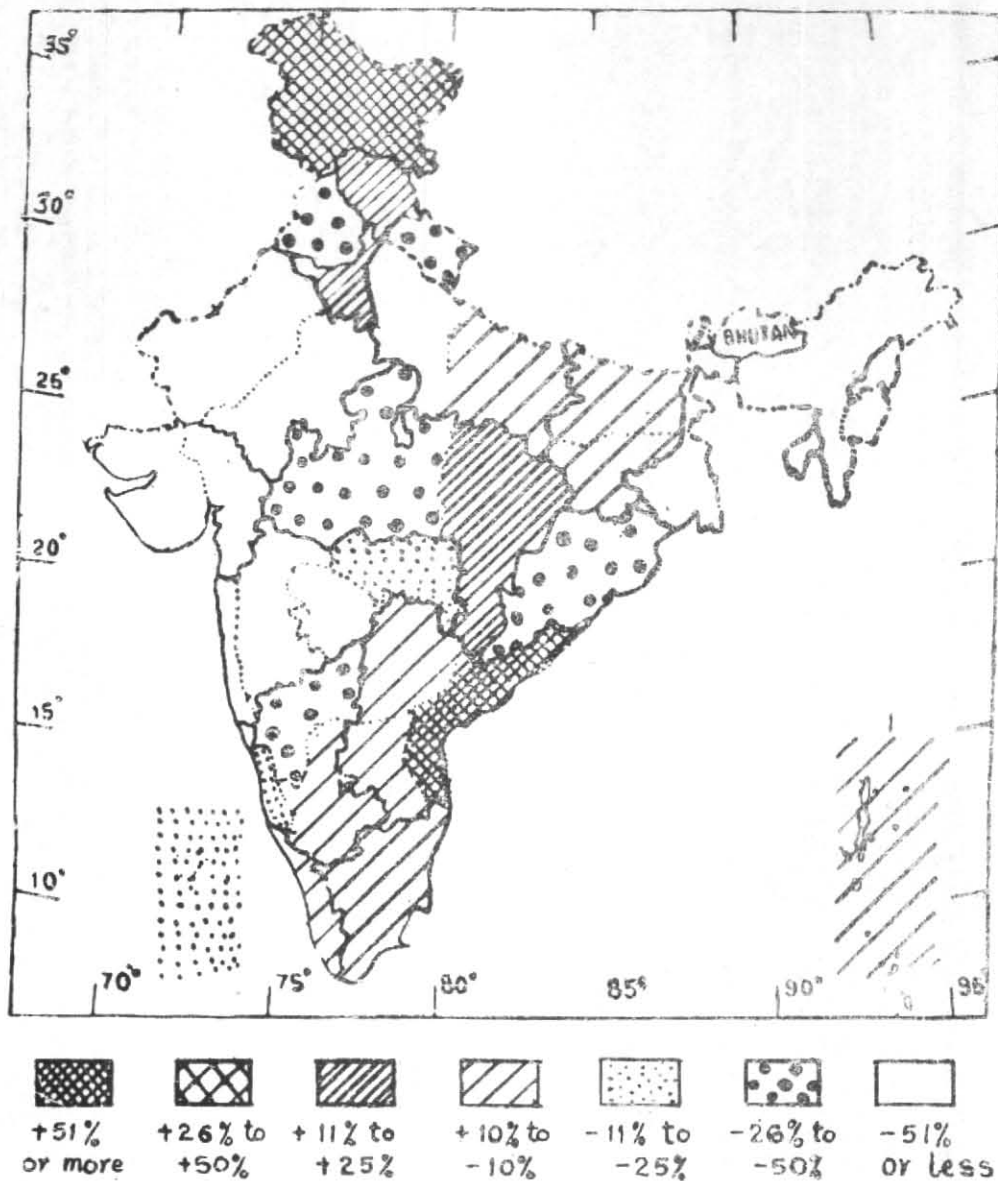


Fig. 2(a)

Rainfall for the period 1 October to 31 December 1972

(Percentage departure from Normal)

## DECEMBER

Seven western disturbances moved across north-west India during this month. Of these, the two western disturbances which moved across the Western Himalayas between the 8th and 12th and an induced low which moved from south Rajasthan to north Madhya Pradesh and adjoining south Uttar Pradesh between 8th and 10th, caused widespread rain and snow in the Western Himalayas on the 10th and 11th and fairly widespread rain

with isolated heavy to very heavy falls in Punjab and Haryana on the 10th. The two western disturbances which moved across the Western Himalayas in the third week also caused good rainfall in Jammu & Kashmir and Himachal Pradesh. Due to heavy rain and snow in the Western Himalayas, air services between Delhi and Srinagar were suspended for a few days in the second and third weeks. The principal amounts of rainfall

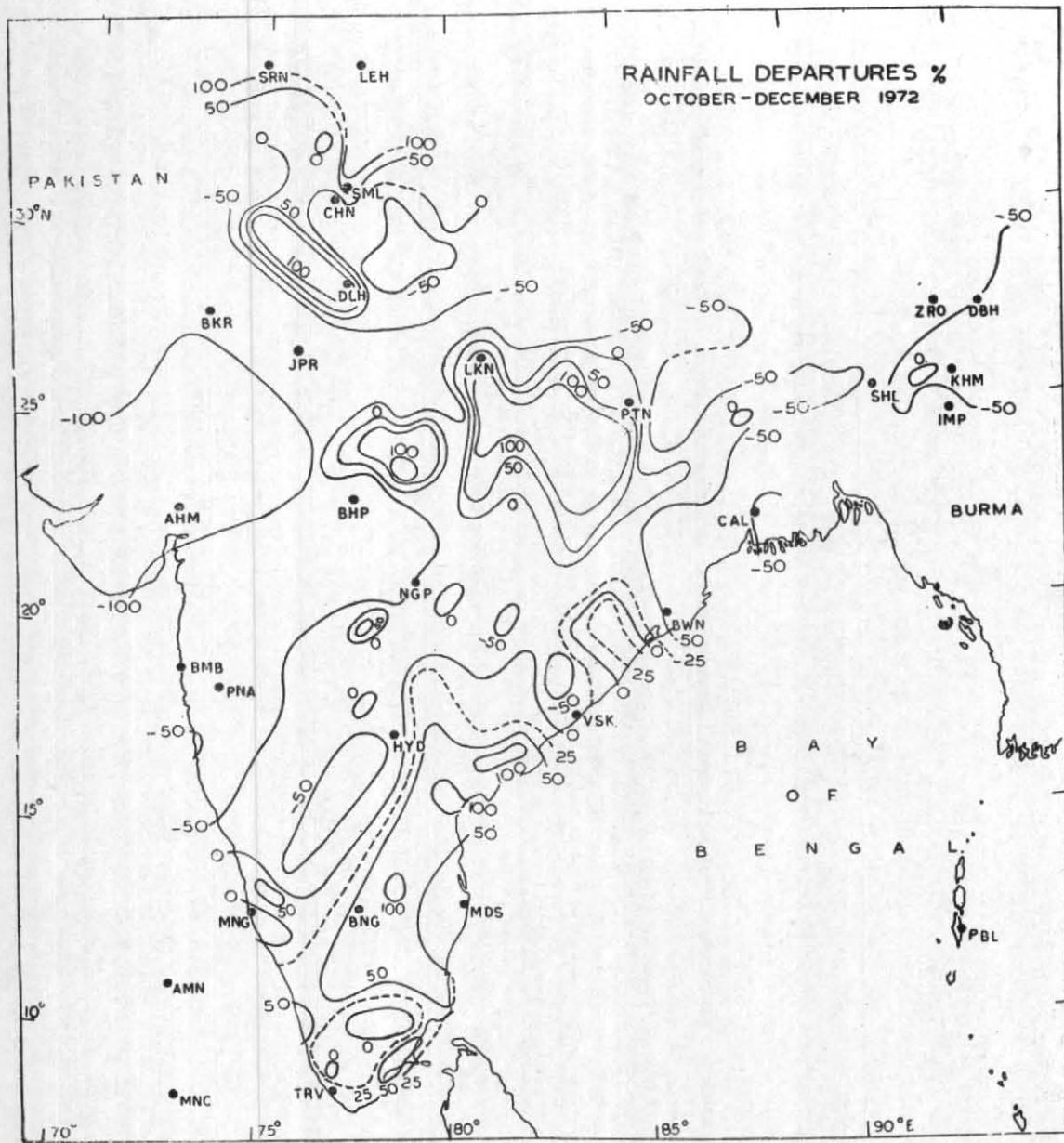


Fig. 2(b)

Percentage departure from normal of rainfall during 1 October to 31 December 1972

associated with the western disturbances were :

Date	Station	Rainfall (cm)
10	Kalpa (Himachal Pradesh)	28
	Raya (Punjab)	25
	Taran Taran (Punjab)	11
	Bhiwani (Haryana)	11
18	Manali	6
20	Kalpa	8

A depression which formed in southeast Bay of Bengal near 10°N, 89°E on 1 December, intensified into a severe cyclonic storm on the 4th and struck Tamil Nadu coast near Cuddalore on the early morning of 6th. It weakened into a depression that evening and emerged into Laccadive area by the 8th. It weakened further into a low and moved away westwards. It caused fairly widespread rain with isolated heavy to very heavy falls in the Bay Islands from 1st to 3rd and in the south Peninsula between 6th and 10th. Considerable damage to crops and other property was reported

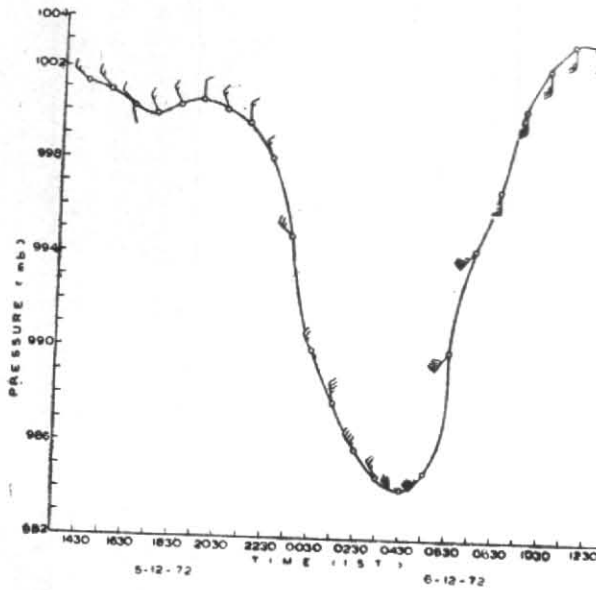


Fig. 3

Wind and pressure at Cuddalore on 5 and 6 December 1972

from Chingleput, north and south Arcot, Salem, Dharmapuri, Coimbatore, Thanjavur and Tiruchirappalli districts. South Arcot was the worst affected district. Several thousands of people were rendered homeless in these districts. About 80 persons were reported to have lost their lives and several thousands of houses were damaged. In Madras city low lying areas were flooded rendering about 30,000 people homeless. Road and rail communications in the coastal districts of Tamil Nadu remained disrupted for some days. Cuddalore recorded surface winds of 70 to 80 kt between 0500 and 0800 IST of 6th and the lowest pressure of about 984 mb at 0430 IST on the same day. Fig. 3 shows the hourly values of wind and pressure at Cuddalore on 5 and 6 December. Some damage to crops and other property was also reported from the southern districts of Interior Mysore due to heavy rain and floods.

The remnants of typhoon SALLY moved into the Andaman Sea as a depression on the morning of 6th, moved northwards and weakened into a low over extreme north Andaman Sea on the 9th causing scattered or isolated light to moderate rainfall in the Bay Islands on the 6th and 7th.

Another depression developed in the southwest Bay of Bengal near  $7.5^{\circ}\text{N}$ ,  $83.5^{\circ}\text{E}$  on the morning of 20th. Moving northwest, it weakened into a low off east Sri Lanka coast on the 21st and into a trough off Sri Lanka-Tamil Nadu coasts on the 23rd. It caused isolated light to moderate rain in Tamil Nadu from 21st to 23rd.

A low level trough which extended from Madhya Pradesh to Interior Maharashtra between the 8th and 10th caused isolated rain in these areas during this period. There was a spell of good rainfall in the Bay Islands in the third week in association with a trough in the low level easterlies that moved across the Bay Islands between the 18th and 20th.

The rainfall for the month was in excess in coastal Andhra Pradesh, Rayalaseema, Tamil Nadu, south Interior Mysore and Kerala in association with the above mentioned systems. The principal amounts of heavy rainfall associated with the above mentioned systems were :

Date	Station	Rainfall (cm)
1	Hut Bay	12
3	Maya Bandar	16
6	Cuddalore	18
	Kanchipuram	17
	Mayuram	15
	Madras, Nagappattinam	14 each
	Vedaranniyam	12
7	Atirampattinam	22
	Kavali, Pondicherry, Kanchipuram	16 each
	Nagapattinam	12
	Vedaranniyam	11
8	Kodungallur (Kerala)	22
	Gopichettipalayam	18
	Fort Cochin	14
	Coonoor, Alleppey	10 each
9	Coimbatore	18
	Coonoor	11
10	Satyamangalam	19
	Gopichettipalayam	18

Night temperatures were appreciably above normal in some parts of Andhra Pradesh and Interior Mysore in the first week, in many parts of the Peninsula and the central parts of the country in the second week, in northwest India in the third and in north Peninsula and the central parts of the country in the last week. They were markedly so in Madhya Pradesh, interior parts of Maharashtra, north Interior Mysore and Andhra Pradesh from 9th to 13th. Night temperatures were below normal in northwest India and Gujarat State during the last 3 days of the month with moderate cold wave conditions in Kutch on the 30th and in Rajasthan on the 30th and 31st.

### Disastrous Weather Events of 1972

Every year some part or the other of the country experiences spells of unusually adverse weather which brings disaster and misery to large sections of the community by disrupting normal life and economy. Cyclonic storms striking the coastal areas, heavy rainfall or snowfall, floods, droughts, severe thunderstorms, hailstorms and sandstorms, heat waves and cold waves are some of the phenomena which come under this category.

The map on page 184 presents in pictorial form, the areas and time of occurrence of such disastrous weather events during the year 1972. The material is based on observations recorded by the India Meteorological Department and also on various newspaper reports giving the damage to life and property. The details of Disastrous Weather Events are as follows :

#### *Cyclonic Storms*

During this year, five of the seven cyclonic storms which developed in the Bay of Bengal struck the east coast of India. Of these, four were severe in intensity and caused great havoc in the coastal areas.

The first of these cyclonic storms struck the coast near Contai on 14 July. Associated high winds and heavy rainfall disrupted normal life and communication. The railways were reported to have suffered heavy losses due to suspension of rail communication.

During September, two severe cyclonic storms hit south Orissa and adjoining north Andhra Pradesh in succession within a period of 12 days. The first one struck the coast between Kalingapatam and Gopalpur on 10 September and caused much damage to life and property, particularly over 8 to 10 km wide coastal belt in Orissa. Due to torrential rain and 2 to 3 metres high tidal waves, several villages were washed away, rendering thousands of people homeless. Communication, power and water supply systems were badly affected. A large number of cattle heads and about 60 persons were reported to have died. The second severe cyclonic storm crossed the coast near Gopalpur on 22 September. Except for some dislocation in communication, no damage was reported to have been caused by this storm as it weakened immediately on striking the coast.

On 22 November, a severe cyclonic storm crossed the coast near Sriharikota and disrupted communication links to a great extent. Within a fortnight

another severe cyclonic storm crossed the coast near Cuddalore on 6 December and caused great havoc particularly to low lying areas in Tamil Nadu. A number of houses were destroyed leaving nearly 30 thousand people homeless. Rail, road and telecommunication systems got disrupted and damaged. A number of cattle heads and nearly 40 persons were reported to have died due to floods and land-slides.

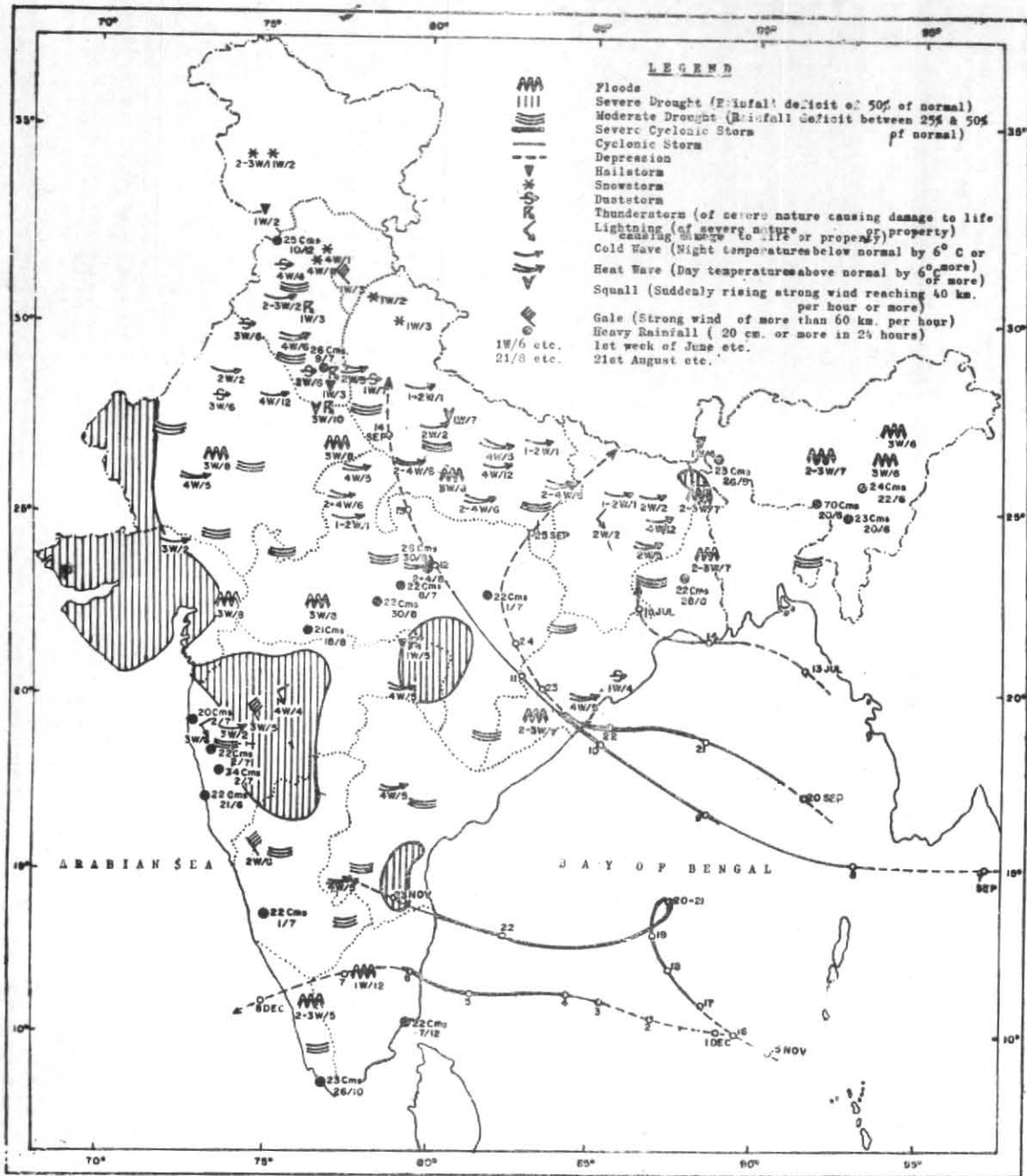
#### *Floods/Heavy rain*

During the 2nd and 3rd weeks of May, heavy rains in Kerala caused floods and land-slides in many parts of the State. Property worth about two crores of rupees was reported to have been destroyed and there was some loss of life also. During the 3rd week of May heavy rainfall occurred in Jammu & Kashmir resulting in loss of some lives.

During the 1st week of June, heavy rainfall in Tumkur (Mysore) caused large scale damage to crops and houses. Railway services and communication systems got dislocated due to heavy rains in Bombay during the 3rd and 4th weeks of June. Eight persons were reported to have been killed in house collapses. Heavy rains in Assam and resulting floods in *Brahmaputra* river during the 3rd week of June caused damage to crops and property worth over Rs. 5 crores. About 200 villages were affected and nearly 8 lakhs of people were rendered homeless. About 50 persons were reported to have died.

In July during the 1st and 2nd weeks, heavy rainfall over Kerala caused damage to property and coconut groves. Some loss of life was also reported. In the 1st week of July, heavy rains in New Delhi caused serious traffic dislocations and flooded low-lying areas. During the 2nd and 3rd weeks of July floods affected Orissa, Bihar, Assam and West Bengal causing damage to property worth about Rs. 11 crores. Nearly 10 lakhs of people were rendered homeless and about 90 persons were reported to have died in floods.

During the 1st and 2nd weeks of August, heavy rainfall caused damage to life and property in Jammu & Kashmir. During the 3rd week of August heavy rainfall caused floods in the *Narmada* river and its tributaries affecting hundreds of villages in Madhya Pradesh and Gujarat. Floods also caused dislocation in road and rail communications. During the same week floods in the rivers in Uttar Pradesh and east Rajasthan caused considerable damage.



Disastrous Weather Events of 1972

*Drought*

1972 was a year of severe drought. The delayed onset of monsoon in June and a prolonged break in July led to drought conditions over the country, particularly in many parts of north India and north Peninsula. The drought was severe in Maharashtra, Andhra Pradesh and some parts of Gujarat, Interior Mysore and Bihar. *Kharif* crops were

totally lost in Maharashtra, Interior Mysore and Gujarat. *Kharif* crops suffered great loss in Andhra Pradesh, Madhya Pradesh, Orissa, Uttar Pradesh, Bihar, West Bengal and Tripura also. The crops were partially lost in Punjab, Haryana Rajasthan and Tamil Nadu. Famine conditions prevailed in many parts of Maharashtra, Gujarat and Rajasthan and there was scarcity of even drinking water in many places. The water scarcity



resulted in cut in electric power supply in States like Maharashtra, Uttar Pradesh, West Bengal, Mysore and Tamil Nadu.

*Thunderstorms/Hailstorms/Squalls/Gales*

During the 1st week of February, due to severe hailstorm over Jammu, the electric supply and water supply were paralysed. Five persons were struck dead by lightning in severe thunderstorm at Gaya in the 2nd week of February.

During the 1st week of March many parts of Punjab, Haryana and west Uttar Pradesh and the cities of New Delhi and Simla were affected by thunderstorms and hailstorms causing damage to crops. A gale of 70 km per hour over Simla uprooted a number of trees and blew off roofs disrupting communication system. During the 1st week of April, hailstorm over Darjeeling damaged the fruit trees.

A severe thunderstorm with hailstorm affected Poona in the 3rd week of May uprooting many trees. During the same week a gale over Ahmednagar caused damage to mango groves and houses. Some people were also injured.

During the 2nd week of June a strong gale affected Hubli area in Mysore, dislocating the communication system.

During the 3rd week of October, New Delhi experienced severe thunderstorm accompanied by a squall with a maximum wind speed of 102 km per hour. Some parts of the city also were lashed by hailstorms.

*Duststorms/Sandstorms*

During the 1st week of April, a severe duststorm hit Cuttack and its suburbs dislocating power and water supply. Several thatched huts were blown off.

In the last week of April severe duststorms occurred in some parts of Punjab damaging harvested wheat crop.

During June, several parts of Rajasthan, Punjab and New Delhi were affected by duststorms causing damage to *kharif* crops worth 15 to 20 crores of rupees. Normal communication system was also affected.

*Snowstorms*

Due to snowstorms in the second half of January and the first half of February, traffic on the roads got disrupted in Srinagar and some places in Himachal Pradesh and west Uttar Pradesh hills. Some loss of life was also reported.

In the 1st week of March heavy snowfall affected some parts of west Uttar Pradesh hills.

In the last week of November heavy snowfall affected some parts of Himachal Pradesh disrupting vehicular traffic.

*Heat and Cold Waves*

In the 1st and 2nd weeks of January moderate cold wave conditions prevailed over Bihar, Madhya Pradesh and some parts of Uttar Pradesh and West Bengal causing a loss of about 100 lives in Bihar and 36 in Uttar Pradesh. Several heads of cattle were also reported dead.

In the 2nd and 3rd weeks of February moderate cold wave conditions prevailed over some parts of Punjab, Uttar Pradesh, Madhya Pradesh, Himachal Pradesh, Jammu & Kashmir, Rajasthan, Gujarat, Maharashtra and Bihar damaging grape and mango gardens. As many as 28 persons and large number of heads of cattle were reported to have died. Some damage to crops was also reported. Cold wave conditions prevailed in Rajasthan, Uttar Pradesh and Bihar in second half of December resulting in some deaths.

During 1st and 2nd weeks of May appreciably above normal day temperatures prevailed in several parts of West Bengal, Uttar Pradesh and Bihar. Due to a prolonged hot spell, moderate to severe heat wave conditions prevailed in many parts of Uttar Pradesh, Madhya Pradesh, Punjab, Haryana, Delhi, Rajasthan, Bihar, Orissa, Andhra Pradesh and Maharashtra during the last fortnight of May and 1st three weeks of June.

The heat waves, according to newspaper reports, took a death toll of over 700 persons in Uttar Pradesh and 500 persons in Bihar. A few deaths were reported from Punjab, Haryana, New Delhi, Andhra Pradesh and Maharashtra also.