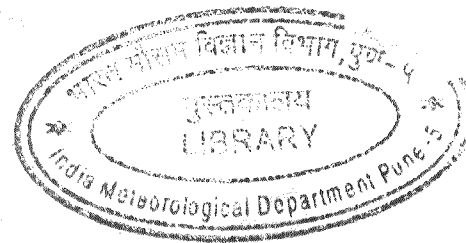




Disastrous Weather Events 1967-1979

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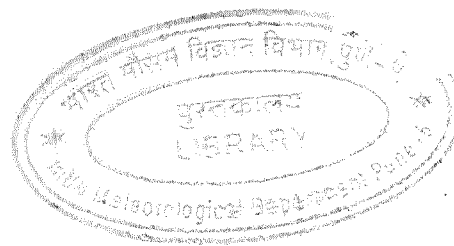


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Disastrous Weather Events

1967 - 1974



Outstanding Weather Events of 1967

Every year some part of the country or other is subject to the vagaries of severe weather which affect the economy of large sections of the public. Examples of such severe weather are severe cyclonic storms that hit the coastal areas, norwesters and severe storms over NE India, heavy rains, floods and droughts which may affect any part of the country, heavy snowfall in the northern areas, heat and cold waves, etc. The above map presents in a pictorial form the outstanding weather events in each State in 1967 giving the date and month of its occurrence. Other natural disasters like earthquakes have also been included.

Details of the Outstanding Weather Events of 1967

1. Cold wave 11th-15th January over NW India.
2. Widespread severe thunderstorms and hail over Central India during 2nd fortnight of March.
3. Widespread severe squalls, thunderstorms and duststorms over U.P. on 13th May. Kanpur recorded squalls of tornadoic force (about 200 kmph.) resulting in widespread destruction and several deaths. A whole passenger train was blown off rails near Varanasi.
4. Moderate to severe heat wave over Bihar, Orissa and parts of A.P. in first week of June.
5. Assam floods 2nd week July and floods in Maharashtra, Gujarat in last week of July.
6. Floods in U.P. in August.
7. 8th-9th September Midnapore floods. Floods in Orissa, Bihar, U.P., West B.P., Rajasthan and Haryana - Harooning of Barmer Express.
8. Orissa micro-cyclone of 9th October. Severe damage to about 120 kms x 30 kms belt near coast near Bhubaneswar; over 1000 persons lost their lives.
9. Koyna earthquake 11th December 1967 of magnitude 7.5 on Richter scale. Vast areas round about devastated - over 200 persons lost their lives.
10. Heavy rains and gales between 4th and 9th December in Madras State - Pambeshvaram island cut off - breakdown in communications.



DISASTROUS WEATHER EVENTS OF 1968

Every year some part of the country or other experiences vagaries of severe weather which bring disaster and misery to large sections of the community disrupting their normal life and economy. Examples of such severe weather are - Severe Cyclonic storms hitting the coastal areas, Nor'westers, severe thunder or hail storms 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 accompanying map presents in a pictorial form, such disastrous weather events of 1968, with their dates and months of occurrence.

Details of the Disastrous Weather Events of 1968

1. Heavy snowfall in the western Himalayas in the second fortnight of January. Srinagar Valley was completely cut off from the rest of the country; and Dal Lake remained frozen for a number of days.
2. Pronounced thunderstorm activity accompanied by hail over central India during 3rd week of February. 30 villages in Nagpur tehsil were hit by a severe hailstorm on 20th. These unseasonal thunderstorms accompanied by hail caused serious havoc to crops in Vidarbha and Marathwada.
3. Modere to severe heat wave over Bihar and adjoining areas during last week of May.
4. Floods in Assam during last week of June, affecting about one million people and an area of over 5,00,000 hectares including cropped area of 81,000 hectares.
5. Widespread dust and thunderstorms over the plains of Northwest India during mid. June. Delhi was enveloped in a blanket of dust for two consecutive days disrupting air traffic on 17th and 18th.
6. Heavy rains over Northeast India between 8th and 12th July causing floods in West Bengal, Calcutta received 18 cms. of rain on 9th the heaviest fall in July in last 50 years. On the same day Krishnanagar had 26 cms., Bagati 24 cms. and Jamshedpur 18 cms.
7. Floods in Kerala, East Rajasthan, Haryana, U.P. and Bihar in July. One passenger train was marooned in flood waters near Hakrana in Rajasthan. Village Subagh in Meerut district was completely wiped out in a cloud burst on the night of 18th July.
8. Severe floods in South Gujarat in the first week of August. The flood waters of the Narmada and the Tapi entered the towns of Broach and Surat. Rail and road communications with Bombay were cut off for nearly one month.
9. Severe drought in Andhra Pradesh and parts of Mysore in August.
10. Drought, causing famine conditions in west Rajasthan in September. Scarcity of fodder, drinking water and food led to migration of thousands of persons and ~~cattle~~ heads from the affected areas.

heads of cattle

11. Unprecedented floods and landslides in Darjeeling, Jalpaiguri and Cooh Behar districts of North Bengal in first week of October, due to exceptionally heavy rainfall in sub-Himalayan West Bengal and Sikkim area from 3rd to 5th October. Pedong recorded 60 cms on 3rd, 70 cms on 4th and 76 cms on 5th. Sankos received 76 cms on 3rd, 64 cms on 4th and 40 cms on 5th. The havoc caused, beggars description, the areas affected presenting a picture of death and devastation all round.
12. A severe cyclonic storm with a core of hurricane winds hit Orissa coast near Puri on 28th October leaving a trail of devastation in the coastal districts of Ganjam, Puri and Cuttack.
13. Exceptionally heavy rain (46 cms. in 24 hours) at Masulipatnam in Andhra Pradesh on 6th November.
14. Drought conditions in Tamil Nadu due to failure of both southwest and northeast monsoons. Even drinking water became scarce in some districts.
15. Heavy snowfall in Simla in the last week of December, causing disruption of road and rail traffic and telecommunications.

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 accompanying map presents in a pictorial form, such severe weather events of 1969, with their dates and months of occurrence.

Details of the Disastrous Weather Events of 1969.

I. TORNADO :

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

II THUNDERSQUALLS :

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

III SNOWSTORMS :

Srinagar experienced heavy snowfall and gale force winds on 29th and 30th April disrupting communications and causing heavy damage to fruit crops. Snow-storms 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 9th and 10th December. Keylong received 15 cms. of snow and Kaza 7 cms.

IV HAILSTORMS :

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

V DUSTSTORMS :

Severe duststorms in West Rajasthan on 21st and 22nd June dislocated rail traffic between Jodhpur and Barmer. Rail tracks were covered with sand 3 feet deep at some places.

VI CYCLONIC STORMS :

A cyclonic storm from the Bay of Bengal struck south Andhra coast on 17th 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 of ~~cattle heads~~ and submerged vast areas of rich standing crops. The total loss was estimated at more than

l heads of cattle

Rs. 100 crores.

A cyclonic storm hit Andhra Coast on 7th November bringing death and devastation in the coastal districts of west and east Godavari, Krishna and Visakhapatnam. 168 human lives were reported 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 water spout over Kolleru lake in Kaikalur taluka of Krishna district. The dead were mostly fishermen.

VII 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 2nd and 3rd 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.

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 105,000 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 23rd October affecting air and train services and throwing the normal life of the city out of gear. Meenambakkam received 23 cms. of rain on 22nd almost touching the 81-year old record of 23.4 cms. on October 31, 1888. Tambaram and Sholavaram, two other suburbs of Madras, recorded 29 cms. and 48 cms. 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.

DISASTROUS WEATHER EVENTS OF 1970

Every year some part of the country or the other experiences spells of unusually adverse weather which bring disaster and misery to large sections of the community and affect normal life and economy. Cyclonic storms striking the coastal areas, severe thunder or hailstorms, duststorms, heavy rain or snowfall, floods and droughts, heat and cold waves are some of the phenomena that come under this category.

The accompanying map presents in pictorial form, the areas and time of occurrence of such disastrous weather events during the year 1970.

Details of disastrous weather events of 1970I. THUNDERSQUALLS :

Several parts of Gujarat State were affected by thundersqualls during the period August 19 to 21. Trees were uprooted, traffic paralysed and communication lines disrupted due to the squalls. A few people were reported to have lost their lives due to lightning strikes

Severe thundersqualls affecting some parts of Himachal Pradesh in the first week of June caused loss of human life and property in the Una and Hamirpur sub divisions.

Traffic was dislocated at Delhi on the 23rd of May due to a heavy thundershower and gale. Two persons were reported killed

II. HAIL-STORMS :

During the first and second weeks of March, hail storms affected several districts of Madhya Pradesh, Orissa, Haryana, Vidarbha, Marathwada and Madhya Maharashtra. Eight persons were reported killed and crops and property worth about Rs. 90 lakhs were damaged

III DUST-STORMS :

Between May 22 and June 8 several parts of Northwest India were affected by dust storms causing disruption of traffic and communications and loss of life. In the Ganganagar area of Rajasthan crops in thousands of acres of fertile land were reported to have been damaged

IV. SNOW-STORMS :

In the last week of January snow-storms affected the Kumaon Hills and Jammu and Kashmir disrupting normal traffic and causing some loss of life.

V CYCLONIC STORMS :

A depression which formed in the North Bay of Bengal on 7th of June intensified into a cyclonic storm and crossed the north Orissa coast on the 9th of June causing heavy rain in the neighbouring areas. Sandheads recorded 24 cm. of rain on the 7th of June

A depression which formed in the Bay of Bengal on 18th October intensified into a severe cyclonic storm and crossed coast near West Bengal - East Pakistan border on the 23rd causing damage to houses and crops in the coastal districts of West Bengal. The life of Calcutta City was paralysed on 23rd.

A depression which formed in the South central Bay of Bengal on 8th November intensified into severe cyclonic storm on the 11th. It crossed East Pakistan coast on the 12th night and brought unprecedented havoc in East Pakistan. It also caused very heavy rain in the Bay Islands and consequent damage to property in these islands. There was also considerable damage to houses and crops in the Mizo hills district of south Assam.

VI FLOODS :

In the third week of June, heavy rains in Assam caused floods in Brahmaputra and its tributaries and inundated vast areas of Jute crops and Paddy fields in the northern districts.

In the third to fourth week of July the flooding of the Alkananda river caused considerable loss of life among pilgrims. A number of bridges, houses and even an entire village in the Joshimath area were washed away.

In the Brahmaputra, floods in the last week of July, first week of August and last week of September and first week of October there was heavy loss of life, property and standing crops.

Floods occurred in Andhra Pradesh and Madhya Pradesh in the last week of August and in Orissa in the second week.

Torrential rain in Gujarat and adjoining areas in the first two weeks of September caused considerable damage to railway track and breaches that disrupted traffic over wide areas. The Narmada and Tapti were in spate resulting in loss of life estimated over a thousand and extensive damage to standing crop and property.

Heavy rains in Gangetic West Bengal in the first fortnight of September flooded vast areas in West Bengal resulting in the death of some 80 persons and rendering several thousands homeless. There was also considerable damage to crops and houses in Gangetic West Bengal during this period.

Floods, landslides and house collapses in the districts of Uttar Pradesh in late September reportedly took a toll of 223 human lives. Crops and property damage have been estimated to run into several crores.

Floods in Aurangabad district in the beginning of October were reported to have rendered over 8000 people homeless. Damaged crops were estimated to be worth about 2 crores.

Heavy rains in Kerala in the middle of October disrupted normal life, flooding low-lying areas and affecting communications.

A spell of torrential rain on September 22 over the twin cities of Hyderabad and Secunderabad reportedly caused the death of 100 people. Stored grains worth lakhs of rupees were washed away and it was reported that 40,000 people were rendered homeless.

Heavy rains and floods affected Tamil Nadu in the last week of November.

1970

- 3 -

VII HEAT AND COLD WAVES :

Moderate to severe heat wave conditions in many parts of north India and in coastal Andhra Pradesh during the second and third weeks of May took a toll of over 500 human lives.

Moderate cold wave conditions prevailed over Madhya Maharashtra and some parts of Central India during the first two to three weeks of December causing a few deaths due to exposure.

DISASTROUS WEATHER EVENTS OF 1971

Every year some part of the country or the other experiences spells of unusually adverse weather conditions which bring disaster and misery to large sections of the community by disrupting the normal life and economy. Some of the phenomena that come under this category are : cyclonic storms striking the coastal areas, floods, droughts, dust-storms, heavy rain or snowfall, sudden cloud bursts, heat waves, cold waves, severe hail storms, thunder-squalls, lightning etc.

The accompanying map presents in pictorial form, the areas and time of occurrence of such disastrous weather events during the year 1971.

Details of the Disastrous Weather Events of 1971*

I. CYCLONIC STORMS :

During this year, four cyclonic storms developed in the Bay of Bengal within a period of about 6 weeks, i.e. from the end of the September to the first week of November. Of these, the most destructive one struck the Orissa coast on the early morning of 30th October and caused very severe damage to life and property. Its genesis was as a depression in the South Central Bay of Bengal on 27th October. It intensified into a severe cyclonic storm on 29th, and at the time of crossing the Orissa coast it was reported that it had a maximum wind speed of about 150 km/hour, accompanied by a tidal wave 5 m. high. While crossing the coast near Paradip it wrought unprecedented havoc in the coastal districts of Orissa and parts of Bengal. About 10,000 people were reported to have lost their lives, and more than one million rendered homeless. The damage to crops and other properties was estimated to be a few crores of rupees.

Another severe cyclone which struck the West Bengal coast on the 29th of September caused thousands of houses to collapse and took a toll of about 60 human lives. Calcutta experienced gales of 100-120 km/hour. In the third week of June, Bhubaneswar in Orissa, was affected by cyclone and torrential rains bringing normal life to a standstill.

II. FLOODS/HEAVY RAIN:

In the last week of February, Jammu and Kashmir experienced heavy rains, snowfall and land-slides causing disruption to traffic and communications.

Heavy rains with high winds in the second week of May in Kerala's Trichur district, caused considerable damage to property like plantain and coconut groves, and disrupted traffic and communications.

In June, heavy rains accompanied by floods affected several parts of Uttar Pradesh, Assam, Bihar, West Bengal and Kerala causing loss of life and damage to crops worth crores of rupees and breakdown of normal traffic and communication. Due to the change of course by some rivers (like the Kall river) thousands of people were rendered homeless. Exceptionally heavy rainfall was recorded at Bombay on the 23rd June (43.4 cms.).

In the first week of July, flooded Gandak washed away 600 feet of railway embankment at Mattatia adjoining Chitanniband and about a dozen villages.

In the month of July, floods affected many parts of Assam, Orissa, West Bengal and Bihar, the most prominent being the Bihar floods. Loss of life was reported. Several villages were washed away rendering thousands

2/7/71

people homeless. Crops and fertile land worth several crores of rupees reportedly destroyed.

In the first and second week of August, flooded rivers in Uttar Pradesh, Bihar and Assam caused further havoc with damage to life and property. Moderate floods also affected Madhya Pradesh, Punjab, Haryana and West Bengal states.

In the last fortnight of August, floods again affected several parts of Bihar, Uttar Pradesh, West Bengal and Himachal Pradesh causing loss of life, property and crops. Parts of Maharashtra were also moderately affected by floods preceded by heavy rains.

In the first two weeks of September, floods in Ganga, Kosi and Gomti rivers affected parts of Uttar Pradesh, West Bengal and Bihar.

In the last week of September, floods of moderate intensity affected parts of Bihar and Maharashtra.

Assam and surrounding areas were affected by floods in the 2nd week of October causing disruption of traffic and communication and loss of life. Several thousands of people were rendered homeless.

On the whole, during this year, Uttar Pradesh, Bihar, Orissa and West Bengal were very seriously affected by floods. According to official reports, 1025 human lives were lost and property worth Rs. 596/- crores was damaged in floods, making this year the most flood-stricken year since 1954. The total population in the country affected by floods was estimated as 57 million and the total area affected as 12.5 million hectares, including a cropped area of 5.87 million hectares.

III. THUNDERSTORMS, HAILSTORMS AND SQUALLS :

In the first and second week of April, heavy thunderstorms and hailstorms affected Tripura disrupting the power supply in and around Agartala.

In the third week of May, parts of Maharashtra and the cities of New Delhi and Allahabad were lashed by thunderstorms followed by heavy rain causing damage to roads, standing crops, mango gardens and even involving loss of life.

In the first week of June, parts of Uttar Pradesh were affected by thunderstorms followed by hailstorms causing damage to fruits and standing crops reported worth crores of rupees.

In the last week of June, squally winds affected Bombay suburbs and Calcutta City.

In the fourth week of October thunderstorms and squalls uprooted a number of trees and blew off roofs of huts and caused power failure in some parts of Bombay city and suburbs.

IV. DUST-STORMS :

During the first week of April, Jammu and surrounding areas were affected by dust storms, followed by squalls and heavy rain, causing breakdown of traffic and communications.

1971

In the third week of May, several parts of North and central India were affected by dust storms which caused considerable inconvenience to the public.

V. SHOW-STORMS :

In the last two weeks of January, heavy snowfall affected parts of Himachal Pradesh, Jammu and Kashmir and Kumaon Hills, disrupting normal traffic.

During the first week of March, several border districts in Kashmir and parts of Uttar Pradesh were also affected by snow-storms.

VI. DROUGHTS :

The delay in the winter rains during the year adversely affected crops in parts of the country. The untimely rains in May over Uttar Pradesh and Bihar also damaged rabi crops like wheat.

Drought conditions prevailed in all the 21 districts of Andhra Pradesh, a portion of Maharashtra (Marathwada region and western Maharashtra) and parts of Mysore and Assam owing to the failure of the monsoon in these regions.

VII. CLOUD BURSTS :

Cloud bursts in the second week of June affected 20 villages in the 18 kilometre mountain belt between Mandaprayag and Ghat in the Chamoli district, involving loss of life and property and causing damage to farm land.

affected Orissa, Bihar, Assam and West Bengal and 2nd and 3rd weeks of July floods causing damage to property worth

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 sand storms, heat waves and cold waves are some of the phenomena which come under this category.

The accompanying map 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.

DETAILS OF DISASTROUS WEATHER EVENTS OF 1972.

I. 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 Coimbatore on 14th 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 10th 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 the 22nd 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 22nd 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 6th December and caused great havoc particularly to lowlying 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.

II. 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 and 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 and 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 communication. During the same week floods in the rivers in Uttar Pradesh and East Rajasthan caused considerable damage.

III. 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.

IV. 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 a severe thunderstorm at Gaya in 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.

V. 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 the month of 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.

VI. 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.

VII. 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 and 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 news paper 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.

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DISASTROUS WEATHER EVENTS OF 1973

Every year some part or other of the country experiences spells of unusually severe weather which cause loss of life and property and disrupt the normal life and economy of large sections of the community. Such weather phenomena are: cyclonic storms, floods and droughts, duststorms, falls of heavy rain or snow, severe thunderstorms, hailstorms, or sandstorms, heat waves and cold waves etc.

The accompanying map shows in pictorial form the areas and times of occurrence of the more important among such disastrous weather events of 1973. The summary is based on observations recorded by the India Meteorological Department and on Press reports of damage to life and property.

FLOODS/HEAVY RAINS

During the second week of March, the Kashmir valley was cut off from the rest of the country, communications by air, road and telegraph being disrupted due to heavy rains. During the first two weeks of May, heavy rains caused floods in various parts of Assam, damaging paddy crops over vast areas. Loss of life and damage to property exceeded Rs.25 crores. In the first week of April, a few districts in South Maharashtra experienced heavy rains with loss of life and property.

More than a lakh people were affected by the floods that swept over different parts of North Bengal during the first week of June. Railway lines and roads were damaged and crops destroyed. Heavy rains in north Assam were responsible for floods during the second and third weeks of June. These caused considerable damage to paddy and other crops; 3 lives were lost and hundreds of wild animals washed away. In the last week of June, 3 lakhs acres of land in the southern parts of Assam were eroded by flood waters.

During the first two weeks of July, heavy rainfall caused damage to life and property in parts of Rajasthan, Bihar, Madhya Pradesh, Gujarat and Maharashtra, and in the hills of Uttar Pradesh. Crops worth several crores of rupees were damaged or destroyed. 90 persons were reported washed away or otherwise killed. During the third week of July, 2,000 heads of cattle were reported to have been washed away by flood waters in Madhya Pradesh and Orissa. Landslides following heavy rains caused Simla to be completely cut off from the rest of the country during the last week of July. During the same period, floods also affected many parts of Himachal Pradesh, Uttar Pradesh, Bihar, Orissa and Gangetic West Bengal. At least 144 persons lost their lives in flood waters or landslides. Crops and property worth two crores of rupees were destroyed. Floods continuing during August, severely affected the Brahmaputra valley, causing extensive damage to crops and loss of life.

A series of disastrous floods occurred in August. During the second week, floods caused havoc in Jammu and Kashmir and took a toll of 68 lives. Floods also affected parts of Punjab, Uttar Pradesh, Assam and Arunachal Pradesh in this week, resulting in the loss of nearly 200 human lives. In the second half of the month, Rajasthan was ravaged by severe floods, possibly the worst in a 100 years. 13 people were washed away. Flood waters affected 14 million people and damaged nearly 10 lakh hectares of standing crops. In the third week of August, there was a recurrence of floods in Rajasthan, Punjab and Uttar Pradesh, which led to the death of 79 persons. The estimated damage to crops and property was over Rs.45 crores. On the 31st August, Idar (in Gujarat State) had a fall of 50 cms of rain.

Floods in Gujarat from 31st August to September 9th, in two spells, caused destruction of property and crops worth Rs.120 crores; 66 deaths occurred. In the first week of September, incessant rains caused serious floods in Narmada and its tributaries, inundating many towns and villages.

According to reports from the Government of Madhya Pradesh, about 300 persons lost their lives, 70,000 head of cattle were washed away and thousands of people rendered homeless. The total loss to property and crops was estimated as Rs. 75 crores.

During the first week of October, parts of eastern Uttar Pradesh and North Bihar experienced floods due to torrential rains in the catchment areas of rivers. The press reported about 145 lives lost. In the second week of October floods again affected Bihar, Orissa and West Bengal. Loss of life was about 100. Some districts of Bihar, West Bengal, Assam and Andhra Pradesh experienced severe floods in the second half of October, resulting in a loss of 77 lives, about 50 lakhs of people being seriously affected.

To sum up, floods took a toll of about 1,200 lives during the year and caused damage amounting to about Rs. 300 crores.

CYCLONIC STORMS

During the year, two out of the five cyclonic storms which developed in the Bay of Bengal, intensified into severe storms. The first of these crossed the West Bengal coast near Contal on the morning of 20th July. In the early morning of 12th October, a cyclonic storm struck the coast near Chandball in Orissa and caused very heavy rain in Bihar, Orissa and West Bengal. More than 60,000 houses and a number of bridges were damaged in North Orissa. Vast areas of agricultural lands in the coastal districts of Orissa and West Bengal were affected. About a 100 persons lost their lives in Orissa alone.

During November, two cyclonic storms developed in the Bay of Bengal within a period of 11 days. The first one intensified and crossed the Orissa coast over Paradip in the early morning of the 9th, causing damage to standing crops in coastal districts.

Another severe cyclonic storm crossed the Bangla Dosh coast near Barisal on 21st December damaging crops in the coastal districts of West Bengal. S.S. "Sonvati" of the Scindia Steam Navigation Company was caught in this cyclone and sank in the Bay of Bengal, about 250 kms from Vishakhapatnam; 10 members of the crew were lost.

DUSTSTORMS AND SANDSTORMS

Gurgaon (Haryana District) had a severe duststorm on 15th May, which lashed the city and neighbourhood with wind speeds reaching 90 km.p.h. It swept away large quantities of unthreshed wheat crop and disrupted power and communication systems. In the second week of May, two severe duststorms hit Delhi, with maximum winds reaching 92 km.p.h. The stormy winds uprooted trees and disrupted normal life. 3 persons were reported killed.

On the 30th May, Lucknow Airport experienced two severe duststorms, with wind speed in one of them reaching 140 km.p.h., causing loss of life and damage to communication and power supply.

During the second week of June, strong dust-raising winds swept Rajasthan for 5 days incessantly; sand-dunes moved over railway lines in the Jodhpur and Bikaner divisions, disrupting movement of trains.

SNOWSTORMS

In the 3rd week of January, avalanches in Baramulla District of Kashmir accounted for 3 deaths. Life in the border districts of Jammu and Spiti in Himachal Pradesh was paralysed during the third week of January due to continuous heavy snowfalls. Heavy snowfall in Jammu and Kashmir during the last week of January caused the cancellation of air flights between Srinagar and Delhi. Vehicular traffic was also disrupted in the hill districts of West Uttar Pradesh due to heavy snowfall.

In the first week of February, 2 persons were killed and 3 injured under an avalanche in the Gorez area of Kashmir. In the Ladakh area 9 persons died when a house collapsed during heavy snowfall in the 2nd week of March.

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DISASTROUS WEATHER EVENTS OF 1974

Extensive damage to property and crops, loss of human life and live stock caused by vagaries of weather in the country are often reported in the press. Some of the major weather events that cause disaster such as Cyclonic storms, floods and droughts; dust storms, heavy rains or snow fall, severe thunder storms, hail storms, sand storms, heat and cold waves are summarised below. The summary is based on the observations recorded by the India Meteorological Department and on the press reports. The accompanying map shows pictorially areas and times of occurrence of the important disastrous weather events of 1974.

1. FLOODS AND HEAVY RAINS :

Due to incessant rains, the Brahmaputra with its tributaries was in high spate causing floods in Assam and adjoining areas during the first and last weeks of June, July, August and first week of September. These floods caused extensive damage to property and loss of human lives and cattle, in addition to rendering many people homeless. Wild animals of a sanctuary in the catchment area which is a tourist attraction either perished or left the sanctuary for safer places. Paddy and Jute crops were destroyed as a result of long under water. The total damage was estimated to be the order of Rs. 50 crores.

Bihar and West Bengal were in the grip of floods during the first, third and last week of July and first week of August. Loss of human lives and cattle were reported from the Jalpaiguri District in West Bengal.

Heavy rains were reported from Maharashtra during the first week of July and first week of August. Bombay (Colaba) recorded an exceptionally heavy rainfall of 58 cm. in 24 hours on 5th July, which was the highest on record. Low level areas in Bombay were heavily flooded and city life was completely paralysed. 50 lives were lost and damage to Railway and public property was estimated at Rs. 6 crores. In the first week of July, landslides occurred due to incessant rains in Shirgaon Khopi Village of Ratnagiri District burying 10 people. Seven people were also killed and about a dozen heads of cattle were lost. The total toll of lives all over Maharashtra State upto 1st week of July was 69.

Almost all the districts in Kerala (except Trivandrum and Quilon) and South Kanara district of Karnataka region were affected by floods due to heavy rains during the last week of July causing extensive damage to crops and property worth several lakhs of rupees. Many were rendered homeless. Loss of life was also reported. The worst affected district in Kerala was Idikki which also experienced landslides.

2. CYCLONIC STORM :

A severe cyclonic storm crossed West Bengal coast on the afternoon of 15th August uprooting large number of trees and telegraphic poles, and flooding parts of Midnapore, Hooghly, Howrah and 24 Parganas districts of West Bengal. Seven persons were killed and twenty three fishermen reported missing. Low lying areas of Digha and Juneput were inundated by tidal waves. During its movement over Madhya Pradesh, heavy rains caused floods in the Narmada and Wainganga rivers which inundated vast areas along their embankments and dislocated road communications. Floods were also reported from some parts of north Orissa in association with this cyclonic storm.

3. DUST/SAND STORMS :

Lucknow and Kanpur experienced blinding dust storms on the 15th May followed by heavy rains, uprooting trees, snapping telegraph and electric overhead wires. Kanpur again experienced a blinding dust storm on 2nd June when a 12 year old boy was reported killed. On the 5th June, at Lucknow a mountain of dust rose into the sky, riding on the crest of high velocity wind, reducing visibility to zero. It was followed by heavy pre-monsoon showers. A dust storm followed by heavy rain lashed Jaipur on 7th June affecting power and water supply. On the same day, Bikaner and surrounding areas experienced a sand storm with high winds of about 100 Km.p.h. uprooting trees and electric poles and disrupting electric and water supply. Churu in Rajasthan was severely hit by a dust storm on 12th June followed by rain and hail storm. Amritsar experienced a severe dust storm on the evening of 3rd July with a maximum wind speed of 145 Km.p.h.

4. / SNOW STORMS :

Nine persons were reported to have been killed due to heavy snow fall on 14th and 16th December, at Dras and on the Tanmarg-Gulmarg road. One pilgrim was reported to have been killed in a snow avalanche near Vaishnu Devi Shrine due to heavy snowfall on Vaishnu Devi mountain on 15th and 16th December.

Kashmir experienced heavy snow fall during the whole of the third week of December dislocating vehicular traffic.

5. / COLD WAVE :

Bihar and North Bengal experienced cold wave for several days during the first half of January. The lowest temperatures recorded during this period were 0°C at Darjeeling, 4°C at Midnapore, 2.5°C at Shillong and 5°C at Patna. This cold spell is reported to have taken a toll of 282 lives. Severe cold spell also swept over Bihar and West Bengal during second half of December when 160 people were victims and lost their lives.

Moderate to severe cold wave conditions prevailed over west and northeast Madhya Pradesh and Gujarat during first half of February. Minimum temperature of 0°C was recorded at Gwalior and Shivpuri on 8th February, at Gwalior, Khajuraho and Raisen on 9th February and at Shivpuri on 10th February. During this cold spell crops were damaged in many districts of Madhya Pradesh.

The first half of February was the coldest during the last five years over most parts of northwest India. Night temperatures were 6 to 12°C below normal over these areas. The night temperatures at Jodhpur Air-Port and Churu were -3°C and -5°C respectively on the 7th February. Kashmir, U.P. and Rajasthan were in the grip of cold wave during the second half of December. According to a Srinagar report, the temperature dropped 6 degrees below freezing point. One person was frozen to death at Kulgam (near Srinagar) on 20th December. 42 persons were reported to have died in U.P. due to cold spell in the third week of December. The death toll mounted to 62 in the last week of December.

6. HEAT WAVE :

U.P. was severely affected by heat waves during the second week of May and June. 11 people were reported to have died of sun stroke near Jhansi and in Balia.

7. DROUGHT :

Tamil Nadu was very severely hit by drought on an unprecedented scale, not experienced since 1878. It was due to the failure of the northeast monsoon rainfall which was below normal by more than 60 percent in the central parts. Acute drought conditions also prevailed in West Rajasthan and adjoining areas in August and September. The monsoon rainfall was deficient in West Rajasthan by 50% or more.

8. THUNDER STORMS, HAILSTORMS, SQUALLS & GALES :

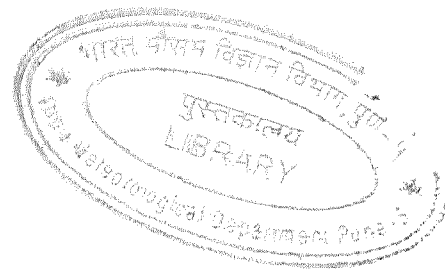
Calcutta and its suburbs were hit by norwesters with wind speed between 60 and 80 Km.p.h. on a number of days during the period of March to June disrupting normal life. Three persons were reported to have been killed and more than 100 were affected in Hailakandi subdivision of Cachar district of Assam due to severe thundersqualls on 11th May. A severe thundersquall struck southern parts of 24 Parganas on 14th May in which innumerable thatched houses were razed to ground and a number of cattle heads perished. Jaipur airport experienced severe northwesterly squalls on the 23rd May, the most severe of which was accompanied by 110 Km.p.h. wind. Delhi (Safdarjung) experienced severe thunderstorms accompanied by squalls of maximum wind speed 96 and 90 Km.p.h. on 22nd May and 6th June respectively uprooting several trees.

Severe squalls were reported from Nagpur, Indore and Jagdalpur on 2nd April, 25th May and 15th June with wind speed of 110 Km.p.h., 134 Km.p.h. and 125 Km.p.h. respectively. Alleppey and Ernakulam Districts experienced severe squalls and thunderstorms during first week of April causing loss of life and extensive damage.

Due to severe lightning, two persons were reported to have been killed on 20th May near Divar Jetti (Panjim), 8 persons at Krishnapuram in East Godavari on 12th October, two bullocks and one person at Machilipatnam on 24th October.

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Disastrous Weather Events 1975



DISASTROUS WEATHER EVENTS OF 1975

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Extensive damage caused by the vagaries of weather in the country are often reported in the press. The major weather events that cause such disasters are cyclonic storms, floods and droughts, duststorms, heavy rains or snowfall, severe thunderstorms, hailstorms, sandstorms, heat and cold waves. The following summary based on the observations by the India Meteorological Department and the press describe the more important events. The accompanying map shows, pictorially, the areas and periods of occurrence of disastrous weather events in 1975.

1. Heavy Snow

On New year day, heavy snowfall disrupted vehicular traffic in Simla and the surrounding regions of Himachal Pradesh. Telecommunication links between Simla and other parts of the country were totally cut off. On the same day, Nainital and its suburbs in the hills of Uttar Pradesh received heavy snow. Moderate to heavy snow was also reported from many parts of the Kumaon Hills.

Another snowstorm again hit Simla and its adjoining areas in the third week of January. Parts of Hangrang valley, Pooh and Kalpa areas of Himachal Pradesh experienced continuous and heavy snow on 29 and 30 January. A mail runner in Spilloh Nasang was fatally swept away by a glacier on 29 January. Tapri in Himachal Pradesh experienced heavy snowfall on 1 February, while heavy landslides blocked a stretch of the Hindustan - Tibet Road, 3 km. from Tapri.

There were two periods of heavy snowfall which caused some damage in Jammu and Kashmir. Road traffic was disrupted by heavy snow in the second week of February. The Kashmir valley was again cut off from the rest of the country by heavy snow, accompanied by a landslide on March 10. Four persons, including two children were killed by an avalanche near Ladakh on March 19.

Bomdila in Arunachal Pradesh experienced heavy snowfall during the second week of February.

Gulmarg, Pahalgam and the high altitude areas in Kashmir recorded heavy snowfall on 7 November. Traffic between Srinagar and Ladakh and Srinagar and Gulmarg was disrupted.

2. Cold Waves

Delhi and Bhopal were in the grip of a severe cold wave on New Year eve. Rajasthan was under the grip of a moderate to severe cold wave from the last week of February to the 3rd week of March.

During the 2nd and 3rd weeks of February, the central parts of Uttar Pradesh were under severe cold wave conditions; Haryana, Punjab, northwest Madhya Pradesh, Gujarat, north Madhya Maharashtra and Bihar Plains recorded a moderate cold wave.

Gujarat was under the grip of a moderate to severe cold wave during the second week of March.

The plains of Uttar Pradesh were under the grip of a cold spell in the second week of December, with the minimum temperature touching 0°C in the districts of Ballia, Basti and Moradabad. 22 persons died in this cold spell in Uttar Pradesh, due to exposure. Many cattle heads and birds were also reported to have died.

3. Heat Waves

Moderate heat wave conditions prevailed in Gangetic West Bengal, Bihar, Orissa and Telangana during the 2nd and 3rd weeks of May. The casualty due to sunstroke was 17 in Telangana and 26 in Bihar. A moderate heat wave prevailed in east Uttar Pradesh, central and east Madhya Pradesh, Vidarbha, Bihar and in interior Orissa during the 2nd and 3rd weeks of June.

4. Drought

There was a large deficiency in rainfall over Tamil Nadu during the first four months of 1975, resulting in severe drought in the districts of Chingleput, South and North Arcot, Salem, Ramanathapuram and Pudukottai. Madras city experienced an acute shortage of drinking water.

Deficient rainfall conditions prevailed over Gujarat till the middle of June causing scarcity of drinking water and food in Kutch and many other districts experienced similar difficulties.

5. Thunderstorms, Hailstorms, Squalls, Gales and Lightning

The worst devastation was due to a severe local storm in Ludhiana (Punjab) on 10 March when a tornado accompanied by a hailstorm hit the city. Malda district of West Bengal was lashed by thunder-squalls on 24 April in which 5,000 huts were reported to have been destroyed. Katihar in Bihar experienced a thundersquall on 25 April, causing loss of lives and property. Severe thundersqualls swept through Purnea and Gaya districts of Bihar on 21 and 22 May respectively, uprooting trees and damaging houses resulting in a few casualties. Another thundersquall blew off some wagons of a goods train near Kulu in Monghyr district (Bihar) on 22 May. The eastern part of Nasik was lashed by a thundershower on 29 May, when one girl was reported to have died due to lightning. A Thundersquall lashed Sibsagar district in Assam in the first week of September uprooting many trees and causing widespread damage to houses.

Hailstorms lashed some villages of Hyderabad district on 23 January causing loss of cattle heads and damage to houses. Crops worth about Rs. 6 lakhs were damaged. Midnapur district of West Bengal experienced hailstorm on 25 March, when five persons were reported to have been killed. 4 persons were killed and 24 injured in a severe hailstorm in Hazaribagh (Bihar) on 25 March. Six persons were killed and several injured when a severe hailstorm swept over parts of Assam on the night of 15 April. Over 5,000 houses were damaged and 22 persons died during the hailstorm in Gaya district (Bihar) on 22 May. In Maharashtra, a hailstorm affected the districts of Wardha (28 Feb.), Amraoti (9 Mar.), Nagpur (23 Mar.), Chanda (14 Apr.), Poona (28 May.), Yeotmal (16 Jun.) causing loss of life, rendering people homeless and damaging the wheat crop and orange groves. A hailstorm also swept over Jalpaiguri in West Bengal on 21 April, and Belgaum in Karnataka State on 22 April. South Sikkim area faced acute scarcity of essential commodities following the disruption of communication due to hailstorm in the 2nd week of May.

Gale wind speeds reaching 60 to 70 km.p.h. lashed Veraval and Kandala on 29 September.

Severe lightning struck Medak (23 Jan.), Lalitpur (26 Feb.), Farukhabad (25 Mar.), Kanyakumari and Calicut (first week of April), Mehboobnagar (19 & 25 Apr.), Mehboobnagar (28 May.), Khammam (31 May.), Poona (1 Jun.), Nasik (third week of June), Mehboobnagar (10 Jun.), Madura (July), Ramanathapuram, North and South Arcot and Chingleput (24 Jul.), Gauhati (27 Aug.), Chittoor^{20 Sept} and Medak (29^{Sept} Oct.), Nalgonda (25 Oct.), Bidar (25 Oct.), Neyyattinkara (25 Nov.) and Alleppey (17 Dec.).

6. Cyclonic Storms

4 out of 8 cyclonic storms caused damage over the Indian area. Of these, the severe cyclonic storm of October 1975 caused extensive damage over Saurashtra. The cyclonic storm in the east Arabian Sea, which crossed Maharashtra coast on the evening of 31 May, close to Alibag caused widespread rain and thundershowers in Maharashtra State with isolated heavy falls in coastal Maharashtra on 1 June. According to press reports, landslides and heavy rain dislocated rain and road communications in this area. Coastal steamer services along the Konkan coast were also dislocated. Country craft near Harnai were reported to have jettisoned their cargo due to stormy weather.

A cyclonic storm crossed Bangla Desh coast near Chittagong on 7 June and weakened into a low over Assam and adjacent States. Heavy rain occurred in Tripura in association with this system and caused floods.

A severe cyclone crossed Saurashtra coast near Porbander on 22nd October. According to press reports considerable damage occurred to buildings, crops and other property in the districts of Junagadh, Jamnagar and Rajkot. The loss of human lives was reported to be about 85. The hurricane winds associated with the cyclone uprooted many trees, electric and telephone poles in these areas. A train was blown off its rails near Jam-Khambalia. Jamnagar recorded the highest wind speed of 160 to 180 km.p.h. on 22nd. Swells, 4 to 6 metres, were reported off the Saurashtra coast.

The cyclone which moved close to the Tamil Nadu coast (24-30 November) caused very heavy rain in Madras city and neighbourhood for 3 to 4 days continuously, thereby paralysing the city life. According to press reports, low lying areas in the city were flooded and thousands of people were rendered homeless.

7. Floods and Heavy Rains

The Brahmaputra touched the danger mark during the 2nd half of May at Dibrugarh. It was in high spate at Dibrugarh, Barak and Silchar during the 4th week of June. Due to floods, breaches occurred at several places. The worst hit districts were Lakhimpur, Nowgong, Cachar, Goalpara, Sibsagar and Kamrup. Crops in several hectares, 59 villages and many hutments were affected, in Dhemaji subdivision. Damage was caused to standing crops in about 1600 hectares.

Heavy to very heavy rains occurred in north Bengal during 1st half of June flooding almost all rivers in north Bengal. The districts of Jalpaiguri and Cooch Behar were the worst affected. These floods caused extensive damage to property and crops including tea estates in Duars areas.

In the last week of July, West Bengal was severely affected by floods and landslides. The swollen rivers, Teesta, Jaldhaka, Diana, inundated vast areas. Heavy landslides occurred in the Jalpaiguri and Darjeeling sections of N.E. Railways. Large tracks of arable lands were submerged by floods in Mechi river. About 45,000 people were rendered homeless.

Heavy rains and squally winds occurred in the coastal districts of Midnapore, 24 Parganas and Calcutta and neighbourhood in the third week of August. The rivers Subarnarekha, Kangsati, Silavate were in spate flooding large areas. Inundation due to breaches in the Sunderban areas was reported. Large number of boats were capsized in Kakadwip, Bhagirathi and Haldia. About 25,000 persons were affected.

Heavy rain storms occurred in Midnapore, Burdwan and Purulia districts, coal mine belts of West Bengal and contiguous areas of Bihar in the last week of September. Heavy floods occurred in the rivers Kangsvati, Silavate, Rupnarayan.

The total number of people affected by floods in Midnapore district was about 3 lakhs. About 75,000 acres of paddy land were affected. 4,000 houses were damaged and 900 families were evacuated to safer areas.

Unprecedented floods occurred in Champaran, Muzaffarpur and Darbhanga districts in the last week of July. Several thousands of people were dislodged, thousands of acres of cropped land were submerged and 26 persons were reported to have been drowned in Champaran district. The district head quarters of Darbhanga, Madhubani, Sitamari, Bettiah and Motihari were cut off from the rest of the State.

Heavy rains occurred in the catchment areas of rivers Sone and Ganga during 20 to 24 August in Bihar. On 24 August the level of water in Ganga reached an alltime high and was 32 cm above the previous highest flood reported in 1971. On 25 August a deluge, unprecedented in living memory engulfed Patna city. Several places of the city remained 10 to 15 ft. deep under water. Patna was cut off from rest of the country. People had to take shelter on the roofs of buildings for safety. The flood rescue and relief operations were undertaken by the Defence Forces. The flood took a toll of about 200 human lives and 500 cattle heads were lost. Train services between Patna city and places in north Bihar were cut off due to breaches in railway tracks and bridges. Air services to Patna remained suspended till the end of August. 2 lakhs houses were damaged and 1½ crores of people were affected in the worst hit areas of Patna, Chapra, Arrah, Muzaffarpur, Darbhanga and Sahabad districts. Standing crops worth one crore were damaged in Bhojpur district alone. The loss to private and public properties according to press reports was estimated to be about Rs.500 crores.

Rajauli, Koilwar, Samastipur, Hathiadah and Lalbegiaghat reported heavy rainfall causing severe floods in the rivers Burhi, Gandak, Adhwara and Bagmati in the last week of September. About half a million people were dislodged and extensive damage was caused to standing crops in more than 300 hectares. 11 human lives were lost and 500 cattle heads perished.

Heavy to very heavy rain occurred in the catchment areas and in the lower reaches of Subarnarekha, Budha Balong, Baitarani, Brahmani and Mahanadi rivers in Orissa in the third week of August. All the rivers except Mahanadi reached the danger levels. Large areas in North Balasore, Mayurbhanj, Keonjhar, Cuttack, Sambalpur and Dhenkanal districts were completely inundated. As many as 43 people died due to house collapses. Crops of over 2 lakhs hectares had been badly affected. Road and rail communication remained suspended from 20 to 23 August.

In the second week of September, 705 villages in Puri, Koraput, Sambalpur, Mayurbhanj, Keonjhar, Balasore, Cuttack districts were affected by floods of Brahmani. Train services were dislocated for 3 days. Nearly one lakh houses collapsed rendering thousands of people homeless.

Eastern parts of Rajasthan experienced floods during the 2nd half of July. Nagaur and adjoining areas had heavy rains incessantly on 17 July due to which half of Nagaur town was under 7 to 15 feet of water. Thousands of people were marooned, several hundred houses collapsed and several breaches occurred in railway track. Ajmer also had exceptionally heavy rainfall on 18 July. Thousands of pilgrims attending Ajmer Urs experienced untold misery.

In the first week of August Ajmer, Alwar, Bharatpur, Sawai Madhopur, Ramgarh and Jaipur districts were worst hit by floods due to heavy rains. Normal life was disrupted, thousands of families were marooned, several houses collapsed and vehicular traffic came to a stand still.

In the first week of September heavy rains dislocated rail road traffic in the districts of Kota, Pali, Ganganagar and Sardarshahar. The railway track

between Sambhar and Merta in Ajmer district was under flood water.

In the first week of July and first week of August, floods in Ghagra and Rapti caused havoc in Baharaich, Basti, Gonda, Azamgarh, Deoria, Kheri and Gorakhpur districts of Uttar Pradesh.

Bulandshahar, Kurja, Sikandarabad and Anupshahar in Uttar Pradesh were affected by floods, in the second week of September. A large number of villages with a population of 2.5 lakhs and crop areas of ninety thousand hectares were affected. 8,000 houses were damaged. There were loss of 25 human lives and 42 heads of cattle.

There were floods in July in the rivers Ravi, Chenab and Jhelum in Jammu and Kashmir resulting in the loss of 20 human lives. Severe cloud burst occurred on 21 August in Kargil town resulting in the loss of 5 human lives and several cattle heads. Due to heavy rains in Delhi State and adjoining areas in the first week of September, Yamuna was flooded affecting 18 villages. In Jammu and Kashmir, road traffic was suspended for 3 days due to landslides followed by heavy rain in the 2nd week of September. 2 labourers were crushed to death, due to landslide, at Salal Hydel Project.

Heavy rain in Bombay city on 20 June, 8, 11 and 30 July, 10 August and first week of September flooded many low lying areas. Road traffic and telecommunication network were seriously affected. A number of lives were lost due to house collapses.

In the first week of August heavy rains followed by flash-floods affected Nanded in Maharashtra. 25 heads of cattle and 150 huts were washed away. The flooding of Godavari river in September swept away 200 huts in Nanded and Parbhani districts. 10 human lives were reported to have been lost.

Heavy rain in August caused landslides in the Ghat areas of Poona-Bombay disrupting rail and road traffic. Severe storm at Poona on 29 September which was classified as the deluge of the decade, washed away about 200 huts and crashed 31 houses rendering several people homeless.

During the second half of June, heavy rains in coastal Karnataka caused floods which inundated large areas including the newly laid Mangalore New Port railway line.

Heavy rains in the last three weeks of October destroyed Jowar, Bajra and Groundnut crops in Raichur, Bijapur and Belgaum districts of Karnataka. Many huts were collapsed.

On account of heavy rains, floods affected Vijayawada town in the first week of August and Srikakulam and Hyderabad city in the last week of August. The rail track over a length of 250 metres in the Raipur-Vizianagaram was breached.

Krishna, East Godavari, Gadwal, Kurnool, Vishakhapatnam, Cuddapah, Prakasam and Nellore districts had heavy rainfall in the second and third week of October causing severe damage to Tobacco crops.

Due to vigorous monsoon conditions Kerala experienced flood, during the second half of June. The flood affected a population of about 4 to 5 lakhs causing loss of life, landslides and extensive damage to crop, and property worth several lakhs of Rupees.

Trivandrum city and neighbourhood, Quilon, Alleppey, Kottayam, Trichur and Calicut districts were badly affected due to continuous heavy rains in the first week of November. There was extensive damage to standing paddy crops. There were

breaches in the bunds of canals and people were evacuated to places of safety. Agricultural operations came to a standstill. In Calicut district, landslides had occurred in South Wynad, and this had claimed the lives of 4 persons. In the high ranges landslides followed by heavy down pour had damaged, paddy, pepper and tuber crops.

In Tamil Nadu, Thanjavur district, Madras city and adjoining Chingleput district had continuous heavy rain in the last week of November. In Thanjavur, salt production in Vedaranyam, area was affected and paddy crop in about 20,000 acres had been submerged. Loading and unloading operations were paralysed in Madras Port and low lying areas were inundated rendering large population homeless. There was loss of human life on account of house collapses.

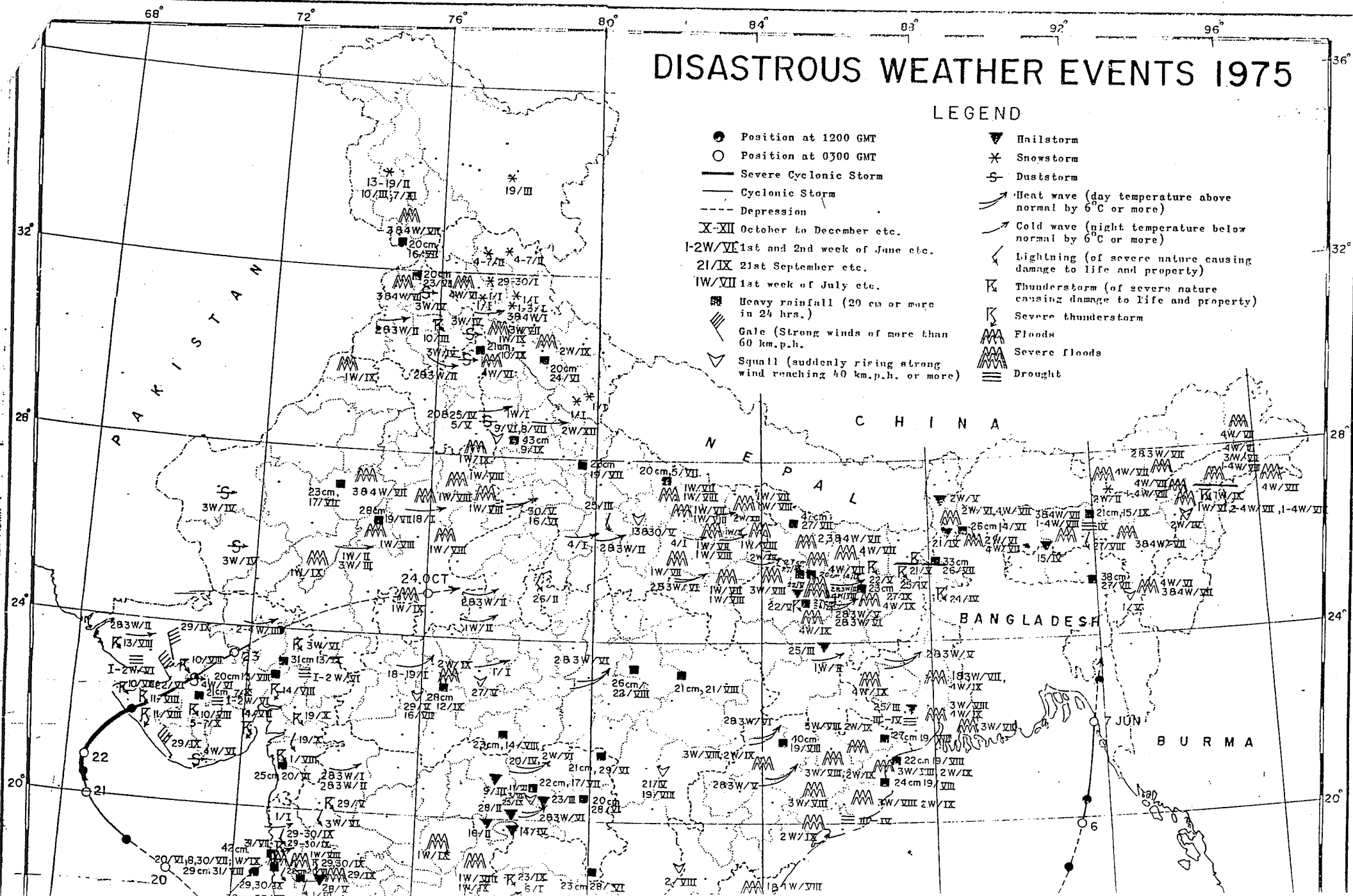
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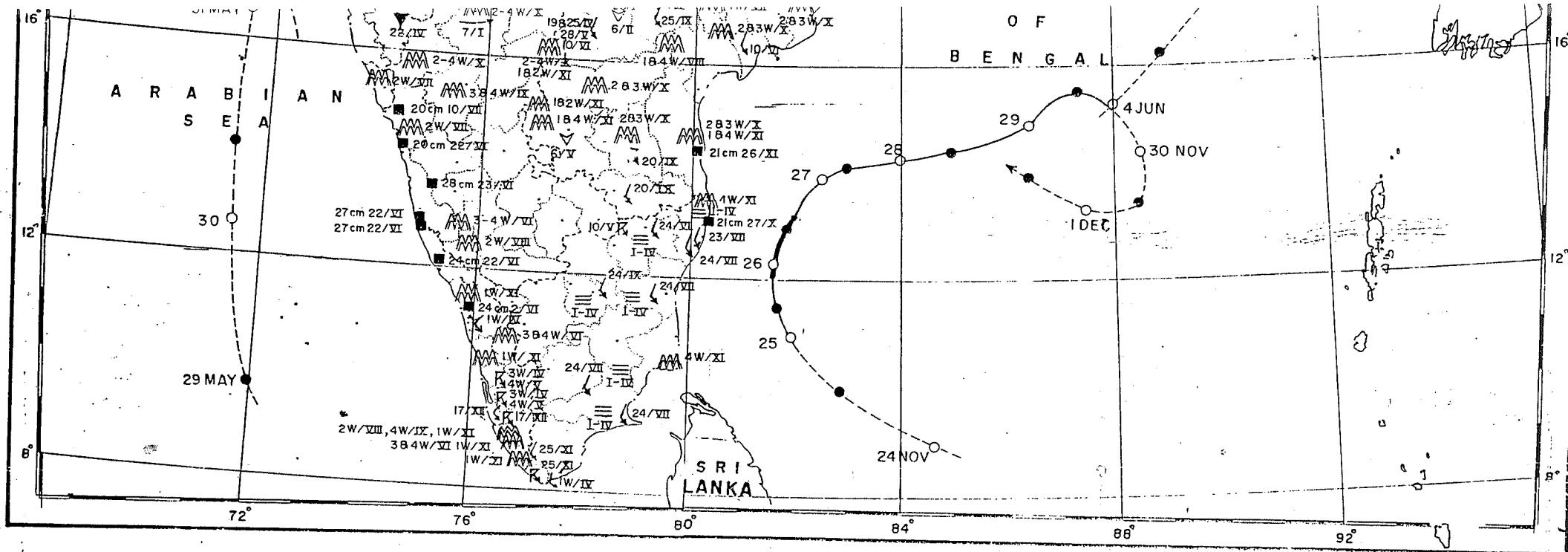
SG/

DISASTROUS WEATHER EVENTS 1975

LEGEND

- Position at 1200 GMT
- Position at 0300 GMT
- Severe Cyclonic Storm
- Cyclonic Storm
- - - Depression
- X-XII October to December etc.
- I-2W/VII 1st and 2nd week of June etc.
- 21/IX 21st September etc.
- 1W/VII 1st week of July etc.
- ☐ Heavy rainfall (20 cm or more in 24 hrs.)
- ⚡ Gale (Strong winds of more than 60 km.p.h.)
- ⚡ Squall (suddenly rising strong wind reaching 40 km.p.h. or more)
- ⚡ Hailstorm
- * Snowstorm
- ☄ Duststorm
- ↗ Heat wave (day temperature above normal by 6°C or more)
- ↖ Cold wave (night temperature below normal by 6°C or more)
- ⚡ Lightning (of severe nature causing damage to life and property)
- ⚡ Thunderstorm (of severe nature causing damage to life and property)
- ⚡ Severe thunderstorm
- ☄ Floods
- ☄ Severe floods
- ☄ Drought





Disastrous Weather Events 1976

DISASTROUS WEATHER EVENTS OF 1976

The major weather events that cause disasters are cyclonic storms, floods and droughts, duststorms, heavy rains or snowfall, severe thunderstorms, hailstorms, heat and cold waves. The following summary supported by a map based on the observations by the India Meteorological Department and the press describe the more important events of 1976.

1. HEAVY SNOW

Srinagar experienced a moderate snowstorm on 16 Jan. when 5 persons died under an avalanche between Gulmarg and Khilanmarg. Kashmir and Kulu valleys and Garhwal hills were in the grip of heavy snowfall on 27 Jan. Gulmarg recorded 1.5 mtrs. of snow. Air services, road traffic, power and water supply were disrupted due to landslides and avalanches. Traffic and communications from Simla to the interior were affected.

Moderate to heavy snowfall occurred in (i) Kangra district on 1 and 31 Jan; (ii) Kashmir valley on 5, 25 and 26 Feb; (iii) Kalpa valley and Kinnaur district on 14 Feb; and (iv) Kalpa, Pangi and Lahaul Spiti valleys on 16 and 17 Mar.

2. COLD WAVES

Jammu and Kashmir was under the grip of a moderate to severe cold wave in the 4th week of Feb. Moderate cold wave conditions also prevailed during this period in southwest Rajasthan, Himachal Pradesh and Punjab. Telangana experienced moderate cold wave conditions in the 3rd week of Jan. and in the 1st week of Feb. Moderate cold wave conditions also prevailed over Bihar State during the last 3-weeks of Dec. when 10 deaths were reported from Chapra, Hazaribagh, Patna and Nawadah.

3. HEAT WAVES

Moderate to severe heat wave conditions prevailed over coastal Andhra Pradesh and Telangana in the first 2 weeks and in the 3rd week of May respectively. The casualty due to sunstroke was 10 in Khammam district and 2 in Penugonda and Taruku taluk of West Godavari district. Moderate heat wave conditions prevailed in the first week of May over (a) coastal districts of Tamil Nadu; (b) some parts of north Bihar resulting in the death of 1 person in Shanganj (Nawadah), 4 in Mokamsh and 3 in Deogarh; and (c) 3 persons died in Akola district in the 3rd week of May. Dholpur district in Rajasthan was in the grip of heat wave on 4 June where 4 deaths were reported. 21 persons died in Bihar in June due to a heat wave that prevailed over Hazaribagh, Nawadah, Mokamsh, Barauni industrial belt and Deogarh. Parts of Punjab, Haryana and Himachal Pradesh experienced moderate heat wave conditions in the first week of July.

4. DROUGHT

Drought conditions prevailed in eight districts of Kerala during the first half of June due to late monsoon rains. Water level in Malampuzha reservoir, Mankara, Chulliar, Valayar, Pothundi dams were very low in the first week of July. Withering of tender coconut flowers, falling of nuts had been reported. Cultivation of paddy, tapioca and plantain were also affected.

Nearly 120 out of 170 taluks in Karnataka were affected by drought. Hansur in Mysore district was in the grip of a drought in the 3rd week of June. Drought conditions prevailed in Mysore, Mandya, Hassan, Chickmagalur and Coorg districts during 3rd week of July. Rs 1.5 crores worth of tobacco production was lost.

During southwest monsoon the storage position in Papanasam and Manimuthar reservoir in Tirunelveli district was very low and the Tamparaparani river dried up in June.

5. DUSTSTORMS, HAILSTORMS, SQUALLS, THUNDERSTORMS AND LIGHTNING

Duststorms hit Jammu (112 km.p.h., 28 Apr), Chandigarh (93 km.p.h. 17 May), Delhi (74 km.p.h. 20 May), Alwar, Kotputli, Nagaur, Jhunjhunu and Sojanganh in Rajasthan (20 May), Bharatpur (21 May), Jammu (120 km.p.h., 4 Jul), Jullundur (4 Jul) and Ferozpur (3 Oct) uprooting trees and disrupting power supply and communications.

Moderate to severe hailstorms hit Jaipur (15 Feb, 19 May), Nainital (16 Feb, 10 May), Hoshiarpur district (19 Feb), Jammu and neighbourhood (19 Feb), Bhind district (27 Feb), Jalgaon (30, 31 Mar), Ludhiana and Ferozpur districts (9 Apr) and damaged crops extensively. Hailstorms also hit Allahabad district (3 Apr), Erinnagar district (10 Apr and 17 May), Wardha (11 Apr), Agartala (11, 19 and 20 Apr), Madak district (22, 23 Apr), Karimnagar and Nizamabad district (22 Apr), Warangal and Kolhapur district (23 Apr), Baripada (24 Apr), Anantnag (18 May, 21 Jun, 9 Jul and 30 Sep), Simla (22 May), Chamba (6 Jun), causing damage to crops, fruit gardens, houses and death to cattle and human beings.

Thundersqualls swept through Tezpur and its neighbourhood on 21 Apr, where a girl was killed and crops were damaged. Gauhati and Manipur reported thundersquall on 18 Apr and Chaparmukh on 25 April. Squalls were experienced at Nagpur Airport on 24 Apr, 26 May, 23 Jun and 25 Aug. A severe Norwester with a squall swept across Gangetic West Bengal and killed 1 person and injured 15 others in 24 Parganas, where a boat capsized in Hooghly river on 18 May, 100 houses collapsed and many trees were uprooted by the squall that swept across many villages of Ponnani district in Kerala on 2 Aug. Squalls also affected Sullia Taluk of South Kanara district on 4 Aug and Lucknow on 7 Oct. causing death to human lives and damage to property. Agartala experienced thundershowers accompanied by squall and hail on 19 April damaging property worth Rs 1,500/-. Delhi experienced a severe thunderstorm accompanied by a number of squalls on the night of 23 May with maximum speed reaching 152 km.p.h. Many trees were uprooted, power supply was disrupted in some areas and four aircrafts at Safdarjung airport hanger were damaged.

Tiruchirapalli experienced a severe thunderstorm accompanied by heavy rains on 31 March damaging plantain and banana crops. Thunderstorm also affected Quilon, Alleppey and Calicut districts on 30, 31 Mar causing loss of human lives and damage to property. A thunderstorm hit Kohima (4 Apr), Agartala (19 Apr), Sibsagar district (20 Apr), Tezpur (21 Apr), Quilon (23 Apr and 26 May), Balaghat (25 Apr), Goalpara district (7 May),

Srinagar (17 May), New Delhi (23 May), Shivapuri (4 Jun). A tornado swept through Bolasore district on 12 May affecting 7 villages causing loss of human and animal life and damaging property. 155 heads of cattle perished in Calcutta, Howrah and north 24 Parganas on 10 July. Thunderstorms also affected Trichur (9 Oct), Quilon (10 Oct), Calicut (11 Oct) and Trivandrum (28 Oct and 2 Nov). Damage to houses and crops, telecommunication channels and power supply was reported from these places.

Gale speeds reaching 90 km.p.h. lashed Dwarka and New Kondla on 30 Jan. Lightning took a toll of life in many places from March to December.

6. CYCLONIC STORMS

7 out of 10 cyclonic storms which developed over the Indian seas were disastrous and they are detailed below.

i) Severe cyclonic storm : 29 May - 5 June

The storm crossed Saurashtra coast on the morning of 3 June. 4 barges each costing Rs 5 lakhs and 6 fishing boats were swept away. Heavy rains and gales lashed Palitana, Dhaunagar, Kaira, Panchmahal, Rajkot and Broach districts affecting 2500 villages. About 25,000 houses were damaged, 70 persons lost their lives and 4500 heads of cattle perished. The total damage was estimated at Rs 3 crores.

Heavy rains in interior Maharashtra caused floods in the river Krishna affecting Satara, Kolhapur and Sangli districts. 6 villages in Satara district were evacuated. The Masawan dam in Thane district was completely washed out. The vehicular traffic between Bombay and Bangalore was paralysed and large areas of cultivable land were inundated. 135 heads of cattle were washed away. About 6000 people in 51 villages in Sangli district were affected. 17 fishermen from Bombay lost their lives.

ii) Severe cyclonic storm : 8 - 18 September

The storm crossed coast near Contai around noon on 11 September. Heavy rains, gales and tidal waves of 2 to 3 metres caused large scale devastation in the coastal areas of Midnapur, 24 Parganas, Sunderbans and Northern parts of Balasore districts. Sagar Island reported a maximum wind of 160 km.p.h. in gusts. Trees, electric and telephone poles were uprooted. The rivers Kangsabati, Silabati and Keleghai were in spate. Large tracts of green fields with crops were inundated by saline water damaging crops in about 1 lakh acres. 30,000 mud and thatched huts were razed to the ground. Several thousands of people were marooned and rendered homeless taking a death toll of 40 lives. 4,000 heads of cattle perished. The fishery department reported a loss of about Rs 1 lakh.

iii) Cyclonic storm : 15 - 21 October

The storm caused heavy to very heavy rains in Tamilnadu on 16 and 17 October. Low lying areas in Madras city and suburbs were water logged. 20,000 people were rendered homeless. Transport services and port operations were paralysed.

Heavy rains lashed Nellore district affecting 60 villages. The flood waters of Kalangi river entered Sulerpet. The rivers Pennar and Swarnamukhi were also in spate. Rail and Road traffic between Madras and South Andhra Pradesh were disrupted. 12,000 acres of paddy fields were submerged and 1000 acres were sandcast. 14,000 houses were collapsed. One village was completely washed out. 1,000 heads of cattle and 4,000 sheep were washed away. 5 persons lost their lives. Total loss was estimated at Rs. 2 crores.

iv) Severe cyclonic storm : 3 - 6 November

The storm crossed Andhra coast, near Masulipatnam on the night of 4 Nov. and caused considerable damage to paddy, sugarcane, cotton, banana, turmeric, betel vines and tobacco crops in Krishna, Guntur and West Godavari districts. 25,000 huts were damaged. Electric and telephone poles were bent at many places. 9 persons were injured, 13 fishermen were missing and 25 persons were killed. The port town of Masulipatnam was hit by gale. The damages were to the extent of Rs 5 lakhs.

v) Severe cyclonic storm : 15 - 17 November

The storm crossed south Andhra coast near Kavali on the night of 16 Nov. The high winds associated with it caused extensive damage to tobacco, betelvine, banana and mango gardens in Nellore, Kavali, Kovur taluks in the Nellore district. Corrugated roofs, tiles of many houses, tobacco barns were blown off. Large no. of telephone/telegraph/electric poles were bent out of shape. 24 country boats and 10,000 houses were damaged. 30 persons died due to house collapses. Total loss of property was estimated at Rs 3.9 crores.

vi) Cyclonic storm : 22 - 29 November

In association with this storm, a giant cloud burst released millions of tons of water over Madras city on 24, 25 Nov. submerging vast areas. Madras city reported a record rainfall of 45 cms on 25 Nov. The Adayar and Cooum river had overflowed their banks and caused extensive inundation in low lying areas and washed away several huts affecting 3 lakh people in slum areas. A large number of industries and electrical installations were affected and estimated loss was more than Rs 7 crores. The floods took a toll of 50 lives due to house collapses/electrocution.

Very heavy rains affected Nellore, Prakasam, Chittoor, Guntur, Krishna East and West Godavari districts in Andhra Pradesh. Paddy crops in many acres were washed out. The rivers Kalandi, Swarnamukhi and Pennar were in spate inundating vast areas. The rail tracks at many places were washed away. 35,000 huts had collapsed. Loss of cattle and damage to irrigation sources was very heavy. The death toll in Nellore district was 45.

vii) Severe cyclonic storm : 29 December - 3 January

The storm passed near Port Blair on 31 Dec. causing widespread damage due to very heavy rain and gale force winds in Bay Islands. Port Blair had a record rainfall of 37 cm and Long Island 32 cm on 31 Dec. A large number of trees were uprooted and about 600 houses were damaged in these islands. Considerable damage to standing crops, fruit orchards and vegetable gardens and loss of few lives were reported. Loss to government property was estimated at about Rs 23 lakhs.

7. FLOODS AND HEAVY RAINS

During 2nd week of June, heavy rains flooded most of the riverine areas in Assam, Manipur, Tripura and Arunachal Pradesh. Swirling flood waters of river Barak submerged vast areas in Cachar district. Silchar, Patharkandi, Karimganj and Kailashahar in Tripura were worst affected.

During first three weeks of July, Cachar, Goalpara, Kamrup, Sib-sagar, Lakhimpur districts in Assam, Manipur, Darrang and Tezu districts in Arunachal Pradesh were affected by floods. Vast areas of land in these districts were submerged. Several thousand people were rendered homeless. Crops worth Rs 6-7 crores, 36,000 houses and 500 heads of cattle were damaged or lost. The death toll rose to 44 in Cachar district in the two successive floods.

In the last week of June, Teesta and Mahananda rivers in Darjeeling district in West Bengal were in spate causing heavy land slides. 3 members of a family were buried alive when a hillock caved in.

During first week of August the rivers Kangsabati, Subarnarekha and Parang were in spate inundating vast areas in Midnapur sub-division. Heavy rains in North Bengal had flooded the rivers Teesta, Jaldhaka, Toras and Diana, causing landslides, disruption to rail and road traffic.

In the 3rd week of August heavy rain in Darjeeling district flooded the rivers Teesta, Mahananda, Ranjit and Mechi. About 200 families and 515 acres of 'Aman' crop were affected.

Heavy rain occurred in catchments of Tangon and Sori during the period, flooding three sub-divisions in West Dinajpur district. 2 lakh acres of crop land and 2 lakh people were affected.

Damodar river was flooded in the 3rd week of September. Vast areas in Arambagh division of Hooghly district were inundated. About 450 houses had collapsed. Over 3 lakhs of people in different parts of Murshidabad district were affected. Bardwan and Nadia districts were also affected by floods.

The floods in Kathjuri and its tributaries had badly hit 45 villages in Puri district in the 2nd week of August. 18,000 acres of paddy lands were submerged. 12 villages in Cuttack district had been marooned and 4000 persons were affected, by flood waters of Kharsun river.

Heavy rains disrupted life almost throughout Bihar in the 2nd and 3rd weeks of September. Several rivers had crossed the danger mark inundating a large number of villages near Danapur, 10 kms from Patna. Muzaffarpur and Chapra districts were badly hit. 300 villages in Bhujpur district were submerged by flood waters of Ganga. Parts of Arrah-Patna, Arrah-Chandi roads were washed away. The turbulent Poonpoo river breached its embankments and flooded low level areas of Patna city. The surging waters of Ganga entered the entire areas of Begusarai, after breaching the Gupta-Lakminia bund and also advanced towards the Barauni industrial complex. Five units of thermal power stations at Barauni were shutdown as a result. 10 minors were drowned when flood waters of swollen Mankari river inundated

a coal mine in Hazaribagh. 14 districts of Bihar were in the grip of floods, the worst affected being Patna district. Paddy in parts of several districts covering 1.12 million hectares of land had been submerged. The unprecedented floods of Bihar had caused damage worth Rs 100 crores to public utility services, according to press reports.

In the 3rd week of August, 200 villages of Rampur and Deoria districts in Uttar Pradesh were affected by floods. Hundreds of villages in Mathura district were submerged under 3 to 5 ft. of water following a 150 ft. breach in Govardhan drain.

The flood situation in eastern Uttar Pradesh had worsened in the 2nd and 3rd weeks of September. The flood waters of Gomti had entered Jaunpur. The Ganga had flooded 100 villages in Mirzapur district and inundated vast areas in Varanasi district. Several villages in Faizabad and Azamgarh district were also flooded. Ballia was the worst affected district where Ganga was flowing 67 cms above the danger mark. The rising Yamuna flooded Etawah district. The loss of property and crops caused by floods in Uttar Pradesh were assessed to be about Rs 130 crores. The death toll in the current UP floods mounted to 228.

11 people were killed due to incessant rains in New Delhi on 18 August.

During the first two weeks of August and 1st week of September, the floods took a toll of 85 people in Punjab. 425 cattle had been perished. Gurdaspur, Ferozpur and Amritsar districts had been severely hit. 2498 villages had been badly affected. During the same period Haryana was also affected by floods. One million acres of standing crops of maize, sugar-cane and coarse grains had been destroyed. 300 villages of Rohtak and Hissar districts were affected.

During the first week of August 144 villages in Srinagar and Anantnag districts were affected by floods in Jhelum. 2 lakh people were adversely affected and fields to an extent of one lakh acres were submerged. 1800 pilgrims to Amarnath were stranded. The flood situation in most parts of Jammu region continued in the 2nd week of August. The water level of Chenab and Ravi was over 10 ft above their danger mark. About 15 villages had been evacuated. 1400 houses collapsed and 3000 acres of land eroded. The death toll rose to 68.

During August, Mount Abu, Jodhpur, Nagaur, Sawai Madhopur, Jaipur, Dholpur and Alwar districts in Rajasthan experienced heavy rains:

Kota, Ganganagar, Chittorgarh districts in Rajasthan experienced heavy rainfall in the 1st week of September. Due to floods in Ghaggar river 2 villages were inundated. Rail and road traffic and 4,000 people were affected.

During the 2nd week of July heavy rains caused floods in Baroda and Bulsar districts. The floods in the river Viswamitri inundated vast areas in Baroda. More than a thousand hutments were washed away. The loss to property was estimated at Rs 2.5 lakhs.

Torrential rain and heavy floods on 31 July hit Dular district, causing extensive damage to property and snapping rail and telecommunication links. The swollen Damanganga river washed away 900 ft. long bridge near Vapi and all the Delhi bound trains from Bombay were suspended. 15 people lost their lives and hundreds of people were rendered homeless. The Union territory of Dadra and Nagar Haveli were also affected by unprecedented floods in Damanganga river.

Narmada crossed the danger mark in the 1st week of August and flood waters entered Broach town. Viswamitri in Baroda also crossed the danger mark. 10 villages in Baroda were affected.

Under the influence of a storm centered near Naliya, exceptionally heavy rain affected Ahmedabad, Nadiad, Godhra in the last week of August. The flooded Narmada entered low lying areas of Broach town. 10 lives were lost in the State.

Several villages in Vidarbha region were also inundated on account of heavy rains in the 3rd week of July.

Unprecedented heavy rains in association with the storm that affected south Gujarat coast on 31 July, caused floods in Pune, Solapur, Nasik and Thane districts. Bombay city was lashed by torrential rains. Three people lost their lives due to wall collapses/electrocution. The flood waters of Bhima entered the holy town of Pandharpur in Solapur district. About 20,000 residents were evacuated to safer places. Paddy crops in 10,000 acres were washed away in Thane district. Considerable damage to groundnut, sugarcane and jowar in Solapur district and loss of Kharif and fruit gardens estimated at Rs 90 lakhs were caused.

Heavy rains lashed Vidarbha region in the 1st week of September causing floods which disrupted road traffic in Akola district.

The flash floods in the mighty river Godavari had isolated the temple town of Bhadrachalam and inundated 79 villages in Khammam district in the 3rd week of July. 15 heads of cattle and 2000 sheep were washed away. 10,000 acres of standing paddy crop in West Godavari district were submerged.

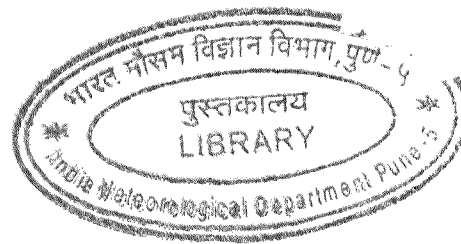
In the last week of July, some areas in Trivandrum, Kottayam, Ernakulam, Kozhikode and Trichur districts in Kerala were flooded due to heavy rains damaging crops worth Rs 15 lakhs. Heavy landslides occurred killing 20 people in Trichur and Idukki districts.

Heavy rain of 10 cm in about an hour had damaged houses, potato crops and washed out some heads of cattle at Ootacamund in Tamilnadu on 11 May. In the 2nd and 3rd weeks of October Chingleput, Nilgiris and Coimbatore districts were affected by floods. 2 children were washed away in wild streams. Several parts of Coimbatore district were severely hit by heavy rains and floods in 3rd week of November. 600 huts were damaged and 2000 persons were rendered homeless. 5 lives were lost. Floods in Vaigai river in Madurai district rendered 100 families homeless.

ANNEX

Disastrous Weather Events 1978

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DISASTROUS WEATHER EVENTS OF 1978

The most striking events of the year are the occurrence of the rare yet one of the severest natural hazards viz. Tornadoes, picturesquely described as the funnel-shaped furies, one over New Delhi on 17th March and another in Keonjargarh district (Orissa) on 16th April. They claimed several human lives, besides causing considerable damage to property along their tracks. Successive waves of floods, the most common of natural disasters during the monsoon season July to September, were responsible for the loss of many human lives and destruction to properties, particularly in the northern parts of the country. In addition, two storms, spells of snowfall, blizzards, dust-storms, severe thunder/hailstorms and heat/cold waves, also were responsible for the loss of human lives and damage to properties.

The summary of these natural hazards, supported by a map, is based on the observations of the India Meteorological Department and the press reports.

S. No.	Date	Region of occurrence	Intensity	Casualties/damages (main features)	Other details
(1)	(2)	(3)	(4)	(5)	(6)
<u>TABLE 1 - SNOWFALL</u>					
1	24 Jan.	Uri sector	Moderate to heavy	3 persons died, 1 injured	-
2	28 Jan.	Bandipur	Moderate	Many cattle heads were lost	Many houses collapsed
3	7-12 Feb.	Srinagar valley, Chamoli, Uttar Kashi, Joshimath, Chakrata, Keylong, Kalpa, Kaza and Manali	Moderate	-	Road traffic disrupted, electric supply cut-off
4	5 Feb.	Higher ranges of Jammu and Kashmir	Heavy	3 pilgrims feared to have died	-
5	18 Feb.	Simla valley	Moderate	-	Vehicular traffic disrupted
6	18 Mar.	Dras area in Jammu and Kashmir	Heavy	10 persons died	-
7	26 Mar.	Kargil	Moderate to heavy	5 persons killed	-
8	6 Nov.	Border districts of Ladakh, Kishtwar mountain, Banihal pass, Gulmarg and higher reaches of Kashmir valley	Moderate	-	Air services cancelled; Traffic between Jammu and Srinagar held up

(1)	(2)	(3)	(4)	(5)	(6)
9	11,12 Nov.	Hotto peak near Narkanda, Dolandhar peak in Kangra district. Rohtang and Kulsam pass in Lahaul and Spiti district	Heavy	One person killed under avalanche	-
10	24 Nov.	Simla, Phagu, Theog, Kufri, Khadrula, Baghi, Narkanda, Kaza, Hotto peak, Rohtang, Kulsam pass and Pongr valley	Moderate to heavy	-	Telecommunication, telephone system affected
11	26 to 28 Nov.	Jogendranagar and Mandi	Moderate to heavy	One person died	Vehicular traffic disrupted

TABLE I
Moderate
Heavy

7.6 to 34.9 cm.
35.0 to 125.0 cm.

TABLE II - COID WAVE

1	1 to 9 Jan.	Nalanda, Nawada, Mokamah, Katihar, Gaya, Ranchi and Hazaribagh	Moderate to severe	101 deaths reported (Mokamah-8, Nalanda-20, Katihar-5, Nawada-9, Gaya-27, Ranchi-7 and Hazaribagh-25)	-	1 2 3
2	4 Jan.	Tilhar area of Northwest U.P.	Severe	5 persons died and a large number of birds perished	-	4
3	3 and 4 Jan.	North Madhya Maharashtra, southwest Madhya Pradesh and north western parts of (1) Rajasthan and (2) Gujarat	Moderate	-	-	5 6
4	12-14 Jan.	Jammu and Kashmir	Moderate	Many cattle heads lost	-	7 8
5	16-19 Jan.	Nawada district	Moderate to severe	3 persons died	-	9 9
6	19-22 Jan.	Bareilly, Ballia and Lucknow districts	Moderate to severe	20 lives lost	-	10 1
7	22 and 31 Jan.	Jalgaon	Moderate to severe	-	-	11 11

1978

(1)	(2)	(3)	(4)	(5)	(6)
8	2 Feb.	Bhuj	Severe	-	-
9	17 and 19 Feb.	Nasik, Jalgaon and Pune. Southwest Rajasthan and adjoining Gujarat	Moderate	-	-
10	18-19 Mar.	Southwest Rajasthan and adjoining Gujarat	Moderate	-	-
11	26-29 Dec.	Nawada, Mokamah, Barauni and Hazaribagh	Moderate	15 persons died in Nawada, 13 in Mokamah and 4 in Hazaribagh	-
			<u>CRITERIA</u>		
			Moderate	6 to 7°C (below normal)	
			Severe	8°C or more (below normal)	

TABLE III - HEAT WAVE

1	15-16 Apr.	Punjab and Northwest Rajasthan	Moderate	-	-
2	26 Apr.	Gulbarga	Moderate	2 deaths	-
3	17-22 May.	Coastal Andhra Pradesh	Severe	3 persons died in East Godavari district	-
4	23 May.	Vijayawada, Visakhapatnam, Nellore districts and Bhadrachalam	Severe	65 lives lost	-
5	25 May.	Ongole district	Severe	1 person died	-
6	20-26 May.	Korba in Bilaspur district	Moderate to severe	6 deaths	Acute shortage of drinking water
7	28-30 May.	Coastal Orissa	Moderate	-	-
8	6 Jun.	Banda district	Severe	65 people died	-
9	9 and 14 Jun.	Alwar district	Severe	120 people died	-
10	12 Jun.	Dholpur	Severe	50 people died	-
11	18 Jun.	Pali district	Severe	60 deaths	-
			<u>CRITERIA</u>		
			Moderate	6 to 7°C (above normal)	
			Severe	8°C or more (above normal)	

69
 16
 75
 93
 68
 170
 308
 60

(1)	(2)	(3)	(4)	(5)	(6)	
<u>TABLE -IV - DROUGHT</u>						
1	1st to 3rd week, Aug.	Ahmadnagar district	-	-	Scarcity of drinking water in several villages;	5
2	1st to 3rd week, Sep.	Cooch Behar, Jalpaiguri, West Dinajpur and Darjeeling	-	-	20,000 hectares of crop affected	6
<u>TABLE V - DUSTSTORM</u>						
1	28 Mar.	Jabalpūr	Severe	One boy killed in house collapse	Several kuchcha houses damaged	7
2	11 May.	Lucknow and neighbourhood	Severe	1 person was killed	6 persons injured in wall collapse	8
3	20 May.	Tonmarg in Srinigar valley	Severe	1 person killed	-	9
4	25 May.	Palampur in Kangra district	Severe	A large number of cattleheads missing	Normal life was paralysed. Trees, telephone poles uprooted. Large number of roof tops blown off	10
<u>TABLE VI - HAILSTORMS</u>						
1	21 Jan.	Central parts of Uttar Pradesh	Moderate	A large number of cattle and birds perished	-	11
2	6 and 7 Feb.	Dabra and surrounding area (Gwalior district), Khalghat region of west Nimar district and Kasawad (Khargone district)	Severe	About 50 thousand people in 120 villages affected. 5 thousand hectares of land affected. 2 thousand huts damaged	Hailstones weighing 250 to 300 gms. reported	12
3	12 Feb.	Basti district	Moderate to severe	About a dozen animals died	Large number of fruit trees were damaged. 50 percent of Rabi crop affected	13
4	14-15 Feb.	Vidisha district and Bhopal	Moderate to severe	1 man died and 19 others injured	Dislocation of traffic and disruption of power supply. Total loss Rs. 2 crores	14

(1)	(2)	(3)	(4)	(5)	(6)
5	17-19 Feb.	Hyderabad	Moderate to severe	10,000 poultry birds perished	Hailstorms associated with a squall damaged standing crops and buildings
6	18 Feb.	Parts of (i) Ajmer, (ii) Jaipur and (iii) Jhunjhunu	Moderate	1 person killed	Crops damaged
7	1-5 Mar.	Alwar, Ganganagar and Beman (Sawai Madhopur)	Moderate to severe	About 100 animals killed	-
8	11 Mar.	Ahmadnagar, Akola, Tonkraj, Khandwa and surrounding areas	Moderate to severe	Standing and harvested crops of Jowar, Wheat and Gram damaged	Peas to lemon size hailstones observed
9	1st to 2nd week Mar.	Nagpur district	Moderate to severe	Rabi crops and orange plantations worth Rs. 10 lakhs damaged	-
10	15-17 Mar.	Betul, Sehore and Satna	Moderate to severe	Crops, trees and houses damaged. Injuries to men and cattle	Hailstones as big as oranges observed
11	17-18 Mar.	Hilly areas of Jammu, Mussoorie, Dehra Dun, Kulu valley and Solan region	Moderate to severe	Crops damaged, widespread damage to fruit trees	Power and water supply disrupted
12	5-10 Apr.	Kota, Pali and Sawai Madhopur districts	Moderate to severe	Some birds killed. Damage to wheat crops	-
13	15-24 Apr.	Dehra Dun, Mussoorie, Najibabad districts	Moderate	Damaged crops and property	-
14	17-20 Apr.	Dibrugarh and Gauhati districts	Moderate	-	Power supply and tele-communication disrupted. Vegetable gardens damaged
15	17-26 Apr.	Bangalore, Chitradurga	Severe	Damage to paddy crops, banana and arecanut trees. Railway tracks damaged	A 500 year old shrine damaged in Chitradurga district
16	19-20 Apr.	Hazaribagh, Daltanganj districts	Severe	One man died and five persons injured	Hundreds of trees uprooted. A number of thatched houses damaged.

(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
17	25-28 Apr.	Nagpur, Nashik, Ahmednagar and Satara districts	Moderate to severe	Loss to the tune of lakhs of rupees reported in Nagpur	Hailstones of diameter 3 cms. reported in Satara	X	
18	27-30 Apr.	Nashik district	Moderate	Damaged crops	-		
19	5-8 May.	Sambalpur and Cuttack districts	Severe	About 20,000 people affected. One person died in Cuttack and two injured in Sambalpur. About 30 houses damaged. 200 hectares of crop affected	7 public utilities suffered a loss of Rs. 70,000		2 1 3 1
20	2 Dec.	Bilaspur district	Moderate	One person killed. Crops damaged	-		1 1
<u>TABLE VII - SQUALLS</u>							
1	9 Jan.	Alair in Kalaguda district	Severe	One person died due to uprooting of tree by squall	-		5 1
2	11 Mar.	Dharwad district	Severe	6 persons died and 300 injured	36 school buildings and gardens damaged. Total loss Rs. 3 lakhs		6 1
3	17 Mar.	Mysore and its surrounding areas	Moderate to severe	Widespread damage to fruit trees and wheat crops	Telecommunications disrupted		7 2
4	8 Apr.	Malappuram district	Moderate	Roofs of some houses were blown off	A school building collapsed. Total loss Rs. 1 lakh		8 2
5	9 Apr.	Devangere, Bidrauranga district	Moderate	Roof tops of many houses blown off. Trees uprooted	-		9 2
6	26 Apr.	North Lakshapur district	Severe	20 buildings completely damaged. 2 persons injured	Power lines disrupted		10 2 1 1
7	1 May.	Gad	Severe (103 kmph)	5 persons injured, trees uprooted	-		11 9
8	12 May.	Panna district	Gale	2 persons killed and several injured	Pavement shops blown off. Power supply disrupted		12 2
9	15 May.	Wardha district	Severe gale	10 persons killed, 60 injured	Power and telephone lines disrupted. Total loss of Rs. 20 lakhs.		1 3
10	22-24 May.	Haripate in Mayaganj district	Gale	4 persons killed, 4 houses collapsed	12 hectares of land affected		

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TABLE VIII - THUNDERSTORMS

X	17 Mar. 78	North Delhi	Severe	About 1,000 people injured and died due to Tornado, which hit North Delhi	30	Roof tops blown off. Buses hurled several feet away. A few heavy trucks overturned. Loss to properties Rs. 1 crore
2	13-18 Apr.	Karimpur in Nadia district	Severe	22 persons killed		-
3	16 Apr.	Hooghly and Howrah and Cannanore districts	Moderate to severe	12 persons died, 7 injured		Roof of one factory damaged
4	16-17 Apr. 78	Keonjhar district	Severe	A tornado swept taking toll of 400 lives		2,000 houses damaged
5	17 Apr.	Jodhpur	Moderate to severe	2 persons died, 22 injured due to two steel girders falling down from the railway bridge		Goods worth Rs. 3 lakhs damaged
6	19 Apr.	Mannarghat in Palghat district	Moderate to severe	3 persons killed and 13 injured		-
7	26 May.	Gulmarg in Srinagar district	Moderate to severe	1 person died and 9 injured. 5 houses burnt		Fruit trees damaged.
8	28 May.	Pune	Moderate to severe	Short circuiting and snapping of overhead wires		Floods inundating low lying areas
9	29 Jun.	Srinagar and Baramulla	Moderate to severe	Old Chinar trees uprooted and fruit trees damaged		Rice saplings destroyed
10	29 Jun. to 1 Jul.	Chamba valley	Moderate to severe	21 lives lost due to cloud burst		-
11	9 Aug.	Lahaul and Spiti districts	Moderate	8 persons died		-
12	27 Sep.	Midnapore district	Moderate	500 houses damaged		-

TABLE IX - CYCLONIC STORMS

1	3-12 Nov.	Tamil Nadu, Kerala and Lakshadweep (Landfall - Cuddalore on 4th)	Depression	120 human lives lost in Tamil Nadu (90 alone in Nilgiris district) and 50 lost in Kerala. Nurseries in about 10,000 acres washed away in Trichy district		Road/rail communications disrupted. Landslides in Ootacamund and neighbourhood. Damage to houses and crops
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2	3-12 Nov.	Gujarat (Landfall - southern parts of Kutch on 12th)	Depression	Three members of a crew of a fishing trawler reportedly lost their lives between Rupen and Veraval. One sailing vessel was reported sunk near Okha	Electric poles near Naliya bent. 60 kuchcha houses destroyed near Jakhan village. Huge stocks of salt washed away. Trees uprooted	4	4 Ju
3	19-29 Nov.	South Tamil Nadu coast (Landfall - Pamban on 24th)	Severe cyclonic storm	6,000 people rendered homeless in Ramanathapuram district. Tidal waves 3 to 4 metres high affected Rameshwaram Islands. 15 villages marooned. Two boats washed away near Pamban. 50 villages in Ramanathapuram and Thanjavur districts submerged. 10 persons were reported to have died and 2,000 huts and fishing boats reported to have been washed away	Total loss to property in Ramanathapuram district estimated to be Rs. 2 crores. But due to timely warnings and effective follow-up action, loss of life and damage to property reduced to minimum	5	3 Ju
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						7	3 we
						8	1 Sep
						9	2 Sep
						10	4 Sep
<u>TABLE X - FLOODS AND HEAVY RAINS</u>							
<u>ANDHRA PRADESH</u>							
1	1st, 3rd week of Aug.	Krishna district	Moderate to severe	400 families rendered homeless. 21 houses damaged. About 8,000 hectares of paddy land submerged and 16,000 hectares of land inundated			
2	1st, 2nd, 3rd week of Aug.	West Godavari, Guntur, Nalgonda, Mahbubnagar, Hyderabad, Khammam, Telangana and Prakasam districts	Moderate to severe	Paddy fields, roads and villages inundated. 44 persons died. 300 heads of cattle perished. About 3.75 lakh acres of land submerged. In Mahbubnagar district, 1,050 houses damaged and 146 tanks breached	The crops of Jowar, Bajra, Ragi, Ground nut, Castor and pulses damaged		
<u>ASSAM</u>							
3	2nd week of Jun.	Kamrup	Moderate		10 villages affected		

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4	4th week of Jun.	Majuli island, Dibrugarh, Darang, Tezpur and Nowgong districts, parts of Sibsagar and North Lakhimpur district	Moderate to severe	9 lost their lives. About 2 lakhs people affected. 7,000 hectares of land submerged. Jute and paddy crops damaged	Train service between Margharita and Ledo stations disrupted. Road and telecommunication disrupted in Lower Assam
5	3rd week of Jul.	Kamrup, Goalpara districts	Moderate to severe	2.10 lakhs hectares and 2.05 lakhs population affected. 2 lives and 5 cattle heads lost	2,000 families affected. Jute and paddy crops over 0.19 lakhs hectares damaged
6	2nd week of Aug.	Diphu district	Moderate	A bridge near Chutionulla was washed away	Water swamped huge tracks of land
<u>WEST BENGAL</u>					
7	3rd and 4th week of Aug.	Malda, Murshidabad, Nadia districts	Moderate to severe	1.5 million people affected, 16 persons died. 6,500 houses damaged. 40,000 hectares of land including 10,000 hectares of crop affected	Total loss Rs. 20 crores
8	1st week of Sep.	Midnapur, Bankura districts (Rupnarain river in spate)	Moderate to severe	50,000 people affected. 41 persons died. 8,000 houses damaged/destroyed. 23 people lost their lives due to boat mishap	Total loss Rs. 10 crores
9	2nd week of Sep.	Malda, Hooghly, Midnapur and Murshidabad	Severe	35.66 lakhs people and 6.57 lakhs hectares affected. 86 human lives and 1266 cattle lost	--
10	4th week of Sep.	Greater Calcutta area	Severe	Due to incessant rains and consequent flooding several streets water logged. Thousands of city-dwellers marooned. Loading and unloading operations in port came to a standstill	Massive power cut ordered. Railway, air-traffic disrupted. Jute/cotton textile industries affected. Production loss of Rs. 5 crores
		Durgapur, Birbhum, Burdwan, Bankura, Hooghly and 24 Parganas	Severe	177 persons died; hospital washed away in Burdwan. Durgapur power project shut off. Raniganj coal belt affected. Flood water entered the towns, several places submerged 2 lakhs cattle heads washed away	Roads flooded but many places went without water supply. Total population affected 152.5 lakhs

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11.	1st week of Oct.	24 Parganas, Birbhum, Howrah, Midnapur, Hooghly, Burdwan, Bankura, Murshidabad and Nadia districts	Severe	58 people died in a bus mishap in a flooded nulla in 24 Parganas district. 51,000 families affected. 1.5 lakhs of chests of tea affected. 2 lakhs heads of cattle perished	Total loss Rs. 9 crores	18
<u>BIHAR</u>						
12.	3rd to 4th week of Jul.	Monghyr, Balia, Madhubani, Samastipur, Saharsa, Sitamari, Muzaffarpur, Darbhanga and west and east Champaran district	Severe	Bagmati and Aihavare rivers swelled above their danger level. 4 million people affected. 27 people killed. 55,000 hectares of land affected	Loss to property Rs. 16.5 lakhs	19
13.	1st week of Aug.	Patna, Gaya, Nalanda	Severe	Due to floods in Punpun and its tributaries, Patna-Gaya road inundated. 70 villages in Patna district affected	-	20
14.	2nd week of Aug.	Monghyr Dinapur near Patna	Moderate to severe	Railway track between Sahepur-Bahal and Monghyr Ghat affected. Vital pipe lines connecting Barauni refinery with Assam and Bangladesh	Barauni Industrial Complex threatened	21
15.	2nd and 3rd week of Aug.	Barauni village, Sitarpur in Suran district	Moderate to severe	Drainage congestion in Dinapur area near Patna, both in east and west approach roads to Patna City submerged. 56 human lives and 388 cattle heads lost	-	22
16.	3rd week of Aug.	Monghyr, Bagalpur and Katihar	Moderate to severe	Flood will hit 7 million people affected. 5 lakhs hectares of crop area inundated. 47,000 houses destroyed. 2,000 heads of cattle perished	Standing crops worth Rs. 35 crores damaged. 24 important road lines closed	23
17.	2nd week of Sep.	Gogri, Khagiriya sub-division of Monghyr district	Moderate	Many people affected	-	24

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18	4th week of Sep.	Gaya, Bhojpur and Chota Nagpur districts	Moderate to severe	6 lives lost. 1455 hectares of land inundated. 100 villages affected	Vast areas inundated
19	1st week of Oct.	Nalanda, Samastipur and Bhojpur districts	Severe	2,55,000 people affected. 11,000 buildings damaged. Vast areas in Bilsa and Bihar Sharif sub-divisions submerged.	-
		Patna	Moderate	Patna flooded due to incessant rains	Vehicular traffic disrupted. Public life paralysed
<u>NEW DELHI</u>					
20	1st week of Mar.	Jagatpur near North Delhi	Moderate	Sudden floods in Jamuna left 400 people marooned.	-
21	1st week of Aug.	New Delhi and surrounding areas	Severe	7 villages affected. Alipore Block, Shastri Park and Brahampuri flooded	-
22	1st week of Sep.	Rural blocks in Najafgarh, Aligarh and Shahadra and 25 Urban colonies in North Delhi	Very severe	16 lakhs people affected. 33 persons died. Crops worth Rs. 6 crores destroyed. 20,000 hectares of land in 130 villages damaged	Rail traffic was diverted. Many roads submerged. All 4 bridges over the Yamuna closed to traffic (for the first time in history). Total loss Rs. 15 crores
<u>GUJARAT</u>					
23	4th week of Aug.	Baroda district and Broach town. Kaira, Sabarkantha and Bulsar districts	Severe	19 deaths occurred. 2,500 persons affected. 200 huts collapsed	-
<u>MARYANA</u>					
24	1st week of Sep.	Karnal, Panipat, Kurukshetra, Sonapat and Gurgaon districts	Severe	108 villages affected. About 3 lakh hectares of land affected. 10 people died. A number of people drowned	Heavy damage to houses and crops. Crops worth Rs. 4 crores lost
<u>HIMACHAL PRADESH</u>					
25	4th week of Jul.	Nalaga sub-division in Solan district	Moderate	1 person washed away	Crops worth about Rs. 1 lakh destroyed

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26	3rd week of Aug.	Bilaspur and Solan districts	Moderate	37 lives lost. Flash floods in village Nala. 7 human lives lost. 60 rendered homeless	Train traffic disrupted. Extensive damage reports from village Jabli near Bilaspur	55	At
27	1st week of Sep.	Simla district	Severe	10 persons died. 34 people washed away. A bank building collapsed	A sawmill, watermill washed away	56	1s At
<u>JAMMU AND KASHMIR</u>							
28	2nd week of Aug.	Chumanung - a region of Ladakh	Moderate	Many areas affected. Large areas completely cut-off from Leh. Bridges beyond Leh considerably damaged	The loss estimated to be Rs. 25 lakhs	57	3r At
29	3rd week of Aug.	Khrew and Akhroor	River Indus in floods following cloud burst	Many houses washed away. Number of bridges, roads, flood protection works, irrigation channels damaged/washed away. 51 houses damaged	Plantation of the Forest Department damaged	58	1s Se
<u>KARNATAKA</u>							
30	3rd week of Jul.	Mudigere, Tirthahalli, Ankola, Mangalore and Hubli areas	Moderate to severe	Many houses collapsed. 5 persons died. 4 persons washed away	Traffic between Mangalore and Mudigere suspended	59	1s Fe
31	4th week of Jul.	Ammembalabolar near Mangalore, South Kanara district	Moderate to severe	2 persons drowned and electrocuted in flooded Netrawati. 2 persons died near Bajpe. 58 houses damaged	Traffic between Mangalore and Bangalore National Highway disrupted	40	2n Va
<u>KERALA</u>							
32	1st week of Nov.	Trivandrum, Quilon, Alleppey, Trichur, Cannanore and Malappuram districts	Severe	44 lives lost. 1 person washed away. 46,000 houses damaged. Crops in 1,05,600 hectares destroyed	Train tracks breached	41	2n Jn
<u>MADHYA PRADESH</u>							
33	1st week of Feb.	Jabalpur	Moderate	Crops over 2,000 hectares damaged	Untimely heavy rains	42	2n Jn
34	1st week of Jul.	Berhanpur, Khandwa	Moderate	Heavy rains caused landslides claiming 11 lives		43	2n Jn

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(1)	(2)	(3)	(4)	(5)	(6)
35	4th week of Jul.	Hamirwa, Jabalpur and/ Raipur	Moderate	-	100 feet rail tracks washed away in floods. Vehicular traffic disrupted owing to the floods in Gaur and Navneeda rivers
36	1st week of Aug.	Jabalpur, Rajghat near Patan	Moderate	Bridge near Patan washed away	Vehicular traffic disrupted
37	3rd week of Aug.	Raipur	Moderate	Road bridge near Jagdalpur submerged. Road communication disrupted	-
38	4th week of Aug.	Indore	Moderate	Kalghat bridge over Narmada river damaged	-
39	1st week of Sep.	Ujjain and Bhind Districts	Moderate to severe	Very heavy rains caused damage to 5,000 houses. 1 lakh people affected. 2 died. 15 heads of cattle perished	Damage to properties worth Rs. 16.75 lakhs
<u>MAHARASHTRA</u>					
40	1st week of Feb.	Wagholi, 4 villages of Thandor Tehsil	Moderate	Cotton/Orange/Linseed/Wheat crops destroyed. 50 heads of cattle lost	-
41	2nd week of Mar.	Salgaon district	Moderate	Heavy rains caused floods in nullah. Harvested crops and cotton crops damaged	-
		Satara district	Moderate to severe	-	Heavy rains damaged blossoms of mango trees
42	2nd week of Jun.	Sir district	Moderate to severe	9 people died and injuries to 6 persons	Torrential rains
		Bombay	Moderate	Floods between Kurla and V.T. disrupted road/rail traffic and telecommunications	-
43	4th week of Jun.	Ramagiri district (Hivare)	-	Wooden culverts washed away in flooded river	-
44	2nd week of Jul.	Bombay City	Moderate	Road traffic dislocated. A child was killed in a landslide	-

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						52	4th Jun
45	4th week of Jul.	Akola	Moderate	Morna river flooded. Death toll 16. Affected Akola town. 6,777 houses damaged	Crops in area 0.02 lakhs hectares. Population 0.51 lakhs affected		
46	4th week of Aug.	Bhandara, Jalgaon, Nagpur and Akola districts	Severe	Dhang river flooded. 40 kuchcha houses collapsed. Bhandara district remained cut-off. Tapti river in Jalgaon district in spate. 3 persons died	Vehicular traffic between Bombay and Indore disrupted	53	1st Apr
						54	1st Nov
<u>ORISSA</u>							
47	3rd week of Aug.	Kalanandi and Koraput districts	Moderate	Flood water from Teh cut-off Bhabanipatna	-		
<u>PUNJAB</u>							
48	4th week of Jul.	Parts of Hoshiapur, Ferozepore and Faridkot	Heavy rains	One human life and 12 cattle heads lost	Crops over 200 hectares and 59 houses damaged		
49	1st week of Aug.	Ferozepore and Ludhiana districts	Moderate	River Sutlej flooded. 6,000 people affected	-	55	4th Nov
50	3rd and 4th week of Aug.	Ferozepore, Patiala, Hoshiapur, Ludhiana, Jullundur, Kapurthala and Ropar districts	Severe	14 deaths occurred. 1.75 lakhs people rendered homeless. 100 heads of cattle perished. 75 villages devastated. 1,45,000 hectares of land affected. 2,000 seed farms valued at Rs. 30,000 suffered. 1,000 primary school buildings, 26 veterinary hospitals and 10,000 tube wells damaged	Flood waters entered the municipal limits of Ludhiana	56	4th Dec
<u>RAJASTHAN</u>							
51	3rd week of Jul.	Churu	Moderate	9 people killed. 7,200 houses damaged	Rs. Loss - 2.41 crores	58	3rd Jun.
		Alwar, Jaipur, Bikaner, Sikar, Jhunjhunu and Ganganagar districts	Moderate to severe	At Lachmangarh 75 houses collapsed. In Sikar, 2 children died. 2 suffered injuries. 300 Pucca houses damaged in Ganganagar district	-	59	3rd of

TAMILNAD

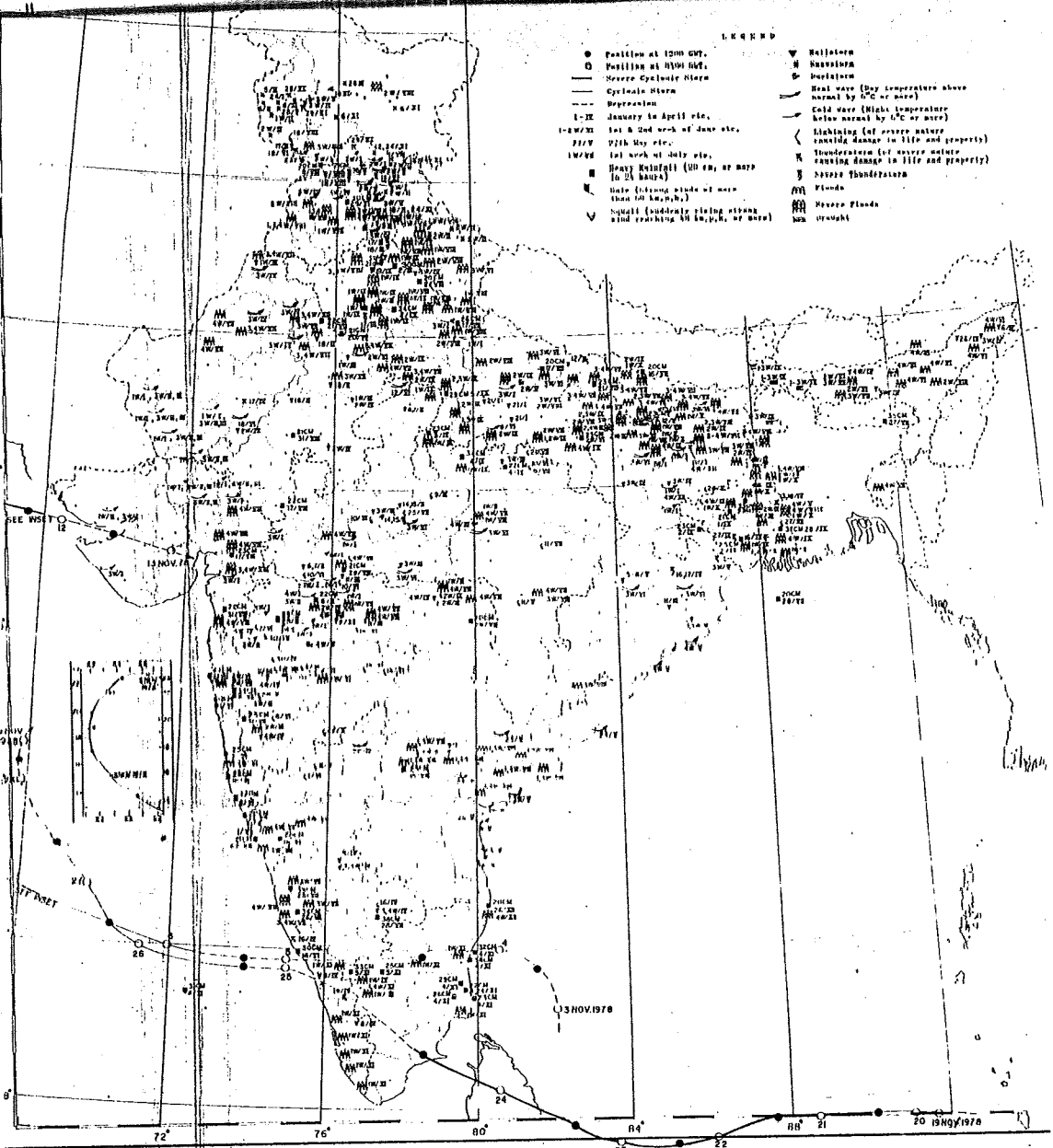
TRIPURA

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(1)	(2)	(3)	(4)	(5)	(6)
52	4th week of Jun.	Bharatpur, Churu, Bikaner, Jhunjhunu, Sikar, Jaipur, Ganganagar and Alwar	Moderate to severe	80 lives lost. 890 heads of cattle perished. 2 lakh houses damaged. Crop worth 1.66 million hectares ravaged. 2 lakhs people affected	Total loss - Rs.38 crores
<u>TAMILNADU</u>					
53	1st week of Apr.	Coimbatore	Moderate	20 huts washed away	Total loss - Rs. 2 lakhs
54	1st week of Nov.	Erudalur, Coimbatore, Sattaramangalam taluk, Ottaseerund, Salem and Tanjavur districts	Moderate to severe	5 persons killed. 15 men, 4 women and 4 children washed away in streams. Many houses damaged. Building washed away (barring a few reinforced structures)	Communication line from Ooty disrupted. 1 lakh hectares of land hit by floods in Ooty and surrounding villages. 74 people killed in land slides
		Nilgiri district	Moderate to severe	98 lives lost. 800 hectares of cropped fields damaged. Orange farms turned into vast sheets of water	A number of building structures collapsed. Ghat roads cut off due to erosion and landslides
55	4th week of Nov.	Ooty	Severe	Market washed away	-
56	4th week of Dec.	Madras City and its neighbourhood and Ramasathupuram district	Moderate to severe	1 lakh people rendered homeless. A bus washed away in which 45 children lost their lives	Rail, road traffic disrupted
<u>TRIPURA</u>					
57	4th week of Jul.	Triprura	Moderate	10,000 people rendered homeless	
<u>UTTAR PRADESH</u>					
58	3rd week of Jun.	Parts of Almorah district Gorha, Basti, Bahraich	Moderate	2 lives lost, 1612 families affected in 102 villages. 252 cattle heads lost	Crops and houses worth Rs.22.16 lakhs damaged
59	3rd-4th week of Jul.	Deoria, Gorakhpur, Ayazgarh and Ayra districts	Moderate to severe	161 lives lost. 40 persons drowned. 14 lakhs hectares of land affected	Rapti river in spate. Total loss of Rs. 30 crores. 23 districts affected in varying degrees

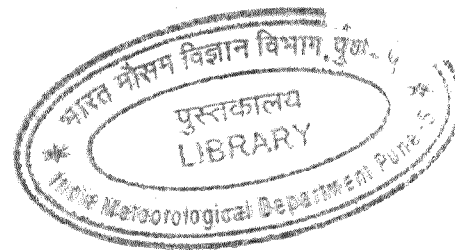
(1)	(2)	(3)	(4)	(5)	(6)
60	1st week of Aug.	Uttar Kashi, Tehri, Saharanpur, Moradabad, Bareilly, Meerut, Rampur and Pilibhit	Moderate to severe	Extensive disruption of communications and road traffic. 25 villages affected. 2 persons died. Landslide near Harit village in Uttar Kashi district. 30000 people hit in Meerut district. 400 cattle heads lost	Bridge damaged
61	2nd week of Aug.	Allahabad, Varanasi, Badaun, Uttar Kashi, Basti and Hardoi districts Garhwal	Moderate to severe -	29 deaths. 14 bridges costing Rs. 1.16 crores washed away. 80,000 houses damaged. 1.6 million hectares of land affected. -	31 other districts affected in varying degrees Road traffic cut-off between Badrinath and Kedarnath
62	3rd week of Aug.	Dehra Dun	-	12 persons killed	-
63	1st week of Sep.	Saharanpur, Moradabad, Allahabad, Dehra Dun, Meerut, Varanasi, Jhansi, Ballia, Amirpur and Jalaun districts. Meerut district	Severe Moderate to severe	925 people died. 1,500 villages affected. 80,000 houses damaged. 2,000 houses collapsed. 25 people died. 8 million people in 500 villages affected	Varanasi University Train services disrupted
64	2nd week of Sep.	Agra, Mathura, Varanasi and Allahabad Lucknow, Gwalior, Ballia, Etawah, Jalaun, Hamirpur and Banda districts	Moderate Severe	Cities were inundated. Many villages marooned. 22 people drowned 51 people died. 5 lakh people affected. 400 villages marooned	- -
65	2nd-3rd week of Sep.	Ballia, Etawah and Hamirpur districts	Moderate	50 percent of the total crops damaged.	-
66	4th week of Sep.	Varanasi and Mirzapur	Moderate	Many places inundated. 1 small railway bridge washed away.	-

Prepared at Meerut, U.P. on 10/9/54
 Digitized by eGangotri



- LEGEND**
- Position at 1000 GMT.
 - Position at 0100 GMT.
 - Severe Cyclonic Storm
 - Cyclonic Storm
 - Depression
 - 1-28 January to April etc.
 - 1-24/25 1st & 2nd week of June etc.
 - 1-17 21st May etc.
 - 1-24/25 1st week of July etc.
 - Heavy Rainfall (50 cm. or more in 24 hours)
 - Hail (lowest value of more than 10 km. hr.)
 - ▽ Small (suddenly rising strong wind reaching 30 km. hr. or more)
 - ▽ Hailstorm
 - Duststorm
 - Duststorm
 - Heat wave (Day temperature above normal by 5°C or more)
 - Cold wave (Night temperature below normal by 5°C or more)
 - Lightning (of severe nature causing damage in life and property)
 - Thunderstorm (of severe nature causing damage in life and property)
 - Heavy Thunderstorm
 - Floods
 - Severe Floods
 - Drought

Disastrous Weather Events 1979



One acre = 0.4047 hect.

Corrected by Shri R.W. Robert

DISASTROUS WEATHER EVENTS OF 1979

The most striking events of the year are the occurrences of : (i) Severe Snowfall in the Lahul valley in Himachal Pradesh during the first two weeks of March in which 232 people were buried alive in avalanches, (ii) Severe cyclonic storm, which hit coastal Andhra Pradesh on 12th May took a toll of about 700 human lives and caused destruction and considerable damage to properties. (iii) Severe floods at Morvi in Gujarat due to breaches in the Machchu Dam on 11th August, in parts of Rajasthan during 2nd and 3rd week of July and in parts of Tamil Nadu during 2nd and 3rd week of November. These floods claimed besides cattle, about 2000 human lives and caused damages to standing crops and properties. (iv) Unprecedented drought conditions in 14 States of the country during the summer monsoon season resulting in the short fall of about 10-12 million tonnes of kharif foodgrains production worth Rs. 1,300 crores.

In addition, duststorm, thunder/hail storm, squalls and heat/cold waves also were responsible for the loss of human lives and damage to properties.

The summary of these natural hazards supported by a map is based on the observations of the India Meteorological Department and the press reports.

S.No.	Date	Region of occurrence	Intensity	Casualties/Damages (Main features)	Other Details
<u>TABLE - I : SNOWFALL</u>					
<u>CRITERIA</u>					
Moderate : 7.6 to 34.9 cm in 24 hrs.					
Heavy : \geq 35.0 cm in 24 hrs.					
1.	Jan. (2nd week)	Garhwal & Kumaon districts	Moderate	-	The Himalayan shrines of Badrinath & Kedarnath under 2 metres of snow.
2.	Jan. (3rd week)	(i) Simla and adjoining areas	Heavy	-	Upper Simla district cut-off from rest of the country, vehicular traffic suspended.
		(ii) Kaza valley	Heavy	-	64 km stretch of road from Charabra to Narkhanda blocked.
3.	27 Jan.	Baniyar (Baramulla district)	Moderate	3 persons killed in avalanche	-
4.	29-31 Jan.	Kashmir/Lahul-Spiti valleys, areas beyond Karcham (Kinnaur district) & hills of west U.P.	Moderate	-	Road and air link severed, vehicular traffic on Simla-Kalka road suspended, telecommunication services disrupted.

(1)	(2)	(3)	(4)	(5)	(6)
					The Arrahat, Woring, Gorang, Lyagrom villages completely wiped out with no survivors.
					At Pin valley 12,000 people stranded
10.	9 Mar.	Jammu	Heavy	-	Mountain areas experienced heavy snowfall, many tourists stranded.
11.	28 Mar.	Ramaningaon (near Badrinath)	Moderate	-	Houses seriously damaged in avalanche.
12.	14 May	Banihal, Pahlgam, Sonamarg and Tammarg areas	Heavy	-	Damage to trees and paddy seedlings.
13.	15 May	Rajdhani, Sadhna, Simthan and Zojila passes.	Heavy	-	All passes closed, fruit trees and paddy seedlings damaged.
14.	22 May	Upper reaches of Poonch and Rajouri	Heavy	-	Wheat crop/fruit trees damaged.
15.	25 May	Gulmarg, Leh, Pahlgam, Sonamarg and Zojila	Heavy	-	Tourist industries affected.
16.	18 Sep.	Khelanmarg, Pahlgam and Sonamarg	Heavy	-	Road to Ladakh blocked
17.	24 Nov.	Pirpanchal range and Rajdhani, Sadhana, Zojila passes	Heavy	3 persons died due to skidding of a truck in Baramulla	All passes blocked, Ladakh cut-off from the rest of the country due to shooting boulders
18.	30-31 Dec.	Rajdhani, Sadhana and Zojila passes	Heavy	-	All passes blocked.

TABLE - II : COLD WAVE

		<u>CRITERIA</u>			
		Moderate	: Night temperature 6 to 7°C below normal		
		Severe	: Night temperature > 8°C below normal		
1.	Jan. (1st week)	Nawadah (Gaya district) Bihar	Severe	4 people died	-
2.	18 Jan.	Basti district U.P.	Moderate	One old woman died	-

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
3.	Jan. (3rd week)	i) Various areas in Garhwal and Kumaon hills ^{U.P.} ii) Rajkot and surrounding area ^{Gujarat}	Severe	-	-		
4.	2 Feb.	North Madhya Maharashtra	Moderate	-	-		
5.	2 & 3 Feb.	South Rajasthan and north Gujarat	Moderate	Thousands of birds and animals died in Jodhpur	-	1.	25-
6.	5 Feb.	Manali and Kulu valley ^{U.P.}	Moderate	-	-		
7.	5-8 Feb.	Bakhtiarpur (Patna district), Nwadah (Gaya district), Hazaribagh and Monghyr districts. ^{Bihar}	Severe	Total death toll : 123	-	2.	28
8.	8 Feb.	Bareilly, Badaun, Moradabad, Pilibhit and Tarai areas ^{U.P.}	Moderate	19 persons died	-	3.	May (2)
9.	22 Feb.	Plains of U.P. ^{U.P.}	Moderate	6 people died	-	4.	May (3)
10.	24 Feb.	Uttar Kashi, Western and North western areas of U.P.	Severe	-	-	5.	May (4)
11.	7 Mar.	West Rajasthan and North Gujarat	Moderate to severe	-	-	6.	May
12.	8-9 Mar.	West U.P., West M.P. Northwest India and Gujarat	Moderate to severe	-	-		
13.	11 Mar.	Eastwards across central India, Bihar to Northeast India	Moderate to severe	-	-	7.	Jun (1)
14.	Dec. (2nd & 4th week)	Bakhtiarpur (Patna district) Hazaribagh, Mokameh-Barauni Industrial complex, Monghyr, Purnea and Samastipur ^{Bihar}	Severe	Total death toll : 40	-	8.	Jun (2)

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(1) (2) (3) (4) (5) (6)

TABLE - III : HEAT WAVE

CRITERIA

Moderate : Day temperature 6 to 7°C above normal

Severe : Day temperature >8°C above normal

1.	25-27 Apr.	Punjab, J & K, Haryana, West Rajasthan, Saurashtra, Kutch, South Gujarat and extreme Northeast India	Moderate to Severe	10 persons died in Saurashtra.	-
2.	28 Apr.	Haryana, Punjab, West U.P., Assam and Meghalaya	Moderate to Severe	21 human lives lost	-
3.	May (2nd week)	Banda and Mainpuri districts	Severe	21 human lives lost	-
4.	May (3rd week)	Coastal West Bengal, Orissa, North Coastal Andhra Pradesh	Moderate	-	-
5.	May (4th week)	Gangetic West Bengal, Assam and Arunachal Pradesh	Moderate	-	-
6.	May	Nawadah, Mokameh, Hazaribagh, Gaya, Purnea, Samastipur, Singhbhum, Patna, Dhanbad, Monghyr, Bokaro and Darbhanga (Bihar State)	Severe	In all 185 persons died	-
7.	Jun. (1st week)	i) Northeast India, Gangetic West Bengal, Orissa and Bihar ii) Nagpur	Moderate to Severe Moderate to Severe	Total death toll : 126 5 persons died and 14 children mostly below 12 years hospitalised	- -
8.	Jun. (2nd week)	i) Central India and North Peninsula ii) Banda, Azamgarh, Basti, Mainpuri, Jalaun, Deoria, Agra and Jhansi districts	Moderate Moderate to Severe	- 14 persons died	- -

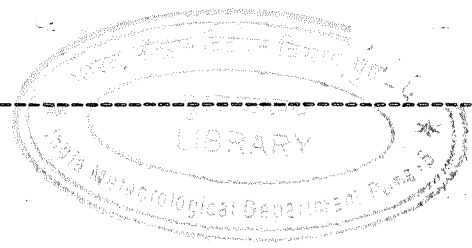
(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
9..	6 Jul.	Churu, Ganganagar, Jaisalmer, Barmer and Bikaner	Severe	100 people died	-	4.	
10.	7-8 Jul.	Many parts of Uttar Pradesh and Bihar	Moderate	-	-	Jul & 4 Aug 4th Sep & 4	

TABLE - IV : DROUGHT

CRITERIA

Mild : Weekly aridity anomaly \leq 25%
 Moderate : Weekly aridity anomaly 26 to 50%
 Severe : Weekly aridity anomaly exceeding 50%

1.	<u>ANDHRA PRADESH</u>						
	Jun. (3rd & 4th week), Jul., Aug. & Sep.	Adilabad, Anantapur, Chittoor, Cuddapah, Kurnool, East Godavari, West Godavari, Guntur, Khammam, Krishna, Nalgonda, Nellore, Prakasam, Ranga Reddy, Srikakulam and Visakhapatnam districts	Moderate to Severe	-	(i) Sowing of paddy, bajra, maize, pulses, groundnut and gingelly delayed. Paddy nurseries withered. (ii) Agricultural operations came to a standstill, resulting in widespread unemployment. (iii) Scarcity of cattle fodder. (iv) 30% power cut imposed due to steep fall in hydel power generation due to failure of monsoon. (v) Water level in irrigation canals too low, hundreds of tanks and wells dried up. (vi) 80% of wet and dry crops sown during the kharif season dried up. (vii) Loss estimated Rs. 1,000 crores.	5.	Jul Aug Jul
2.	<u>BIHAR</u>						
	Jun. (3rd & 4th week) Jul. (1st & 2nd week) Aug. (1st, 2nd & 3rd week) & Sep.	Bhagalpur, Bhojpur, Dhanbad, Gaya, Monghyr, Palamau, Patna, Rohtas and Santal Parganas districts	Moderate to Severe	-	(i) Sowing of paddy seedlings delayed, transplantation affected, seedlings and transplanted paddy withered, agricultural operations came to a standstill (ii) Transplantation of kharif paddy is below 50% (iii) 159 out of 596 blocks worst affected. (iv) Total production loss estimated Rs. 580 crores.	6.	Jun. Jul. (2nd 4th
3.	<u>HARYANA</u>						
	Jul. (1st, 2nd & 4th week), Aug. (1st, 2nd & 3rd week) & Sep.	Entire State	Moderate to Severe	-	(i) Vast tracts stood fallow and transplantation could not be done because of scanty rainfall. (ii) Damage to 75% of kharif crops (paddy, bajra, cotton and sugarcane) (iii) Loss estimated Rs. 125 crores.	7.	Jul. Aug. & Se & 2n Jun. week 3rd Aug. & Sep. (1s Jul., Aug. week) and Jun. (3rd 4th week) (2nd week



	(1)	(2)	(3)	(4)	(5)	(6)
	4.		<u>HIMACHAL PRADESH</u>			
		Jul.(2nd,3rd & 4th week), Aug. 2nd & 4th week), Sep. (1st,2nd & 4th week)	Bilaspur, Chamba, Mandi and Simla districts	Mild to Moderate	-	(i) 40% to 60% of maize, millet, paddy, pulses, potato and apple crops damaged. (ii) Loss estimated Rs. 35 crores.
	5.		<u>KARNATAKA</u>			
		Jul.(3rd week)	Mysore district	Moderate	-	(i) Agricultural operations came to a standstill. (ii) Jowar crop damaged in Mysore and Tumkur districts and cardamom and pepper crops dried up in North Canara district.
		Aug.(1st week)	Tumkur district	- do -		
		Jul.(4th week)	North Canara district	- do -		
	6.		<u>MADHYA PRADESH</u>			
		Jun.(4th week), Jul., Aug. (2nd,3rd & 4th week) & Sep.	Balaghat, Bhopal, Bilaspur, Chhindwara, Damoh, Durg, Guna, Gwalior, Hoshangabad, Jabalpur, Mandla, Narsinghpur, Panna, Raigarh, Raipur, Raisen, Rajgarh, Rewa, Satna, Sehore, Shajapur, Shahdol, Surguja, Tikamgarh and Vidisha districts.	Moderate to Severe	-	(i) Standing paddy crop of early variety in 32,376,00 hectares affected. (ii) Jowar, kodo, kutki, maize, pulses and sugarcane crops wilted. (iii) Crops in 19 lakh hectares completely damaged and in 27 lakh hectares partially affected. (iv) No water in irrigation tanks. (v) Scarcity of drinking water. (vi) Nearly 3 crore people in 30,500 villages faced a spectrum of famine. (vii) Loss estimated Rs. 177 crores.
	7.		<u>MAHARASHTRA</u>			
		Jul.(4th week), Aug.(4th week), & Sep. (1st, & 2nd week)	Thane district	Moderate	-	(i) Kharif sowing held up in most districts due to late onset of monsoon. (ii) Water in irrigation canals low, affecting sugarcane crop production. (iii) A good number of wells dried up. (iv) Shortage of drinking water and cattle fodder. (v) Paddy crop in 32,000 hectares lost in Thane district and bajra, groundnut, early variety of hybrid jowar and pulses crops damaged in other districts. (vi) Loss estimated Rs. 129 crores.
		Jun.(3rd & 4th week), Jul.(2nd 3rd & 4th week), Aug. (3rd week) & Sep.(1st week).	Ahmednagar, Dhule, Jalgaon, Nasik, Pune, Sangli, Satara and Solapur districts.	Moderate to Severe	-	
		Jul., Aug.(2nd & 4th week) and Sep.(1st & 2nd week)	Aurangabad, Bir, Nanded and Osmanabad districts	Moderate to Severe	-	
		Jun.(3rd week), Jul.(4th week) & Sep. (2nd week)	Wardha and Yeotmal districts	Moderate	-	

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Spillover

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
8.	Jun. (1st week)	<u>MANIPUR</u> Entire State	Moderate	-	Rs. Crop worth/12 crores lost.	14.	
9.	Jun. (1st week)	<u>NAGALAND</u> Entire State excepting areas in the foot hills	Moderate	-	(i) 50% of the paddy crop affected. (ii) Agricultural prospect bleak. (iii) Loss estimated Rs. 6 crores.		Jr
10.	Jul. & Aug.	<u>NEW DELHI</u> Entire area	Moderate	-	(i) Crops in about 2,500 hectares in Alipur and Kanjha-wala blocks affected. Worst affected crop was paddy. (ii) Paddy sown in several hundred hectares did not grow at all. (iii) Bajra, jowar, and maize have been damaged. (iv) Crops worth Rs. 3.22 crores destroyed.	15.	Ju we we 3k &
11.	Jun. (3rd & 4th week), Jul. (1st, 3rd & 4th week), Aug. (2nd, 3rd & 4th week) & Sep.	<u>ORISSA</u> Balasore, Phulbani, Bolangir, Cuttack, Dhenkanal, Ganjam, Kalahandi, Keonjhar, Koraput, Mayurbhanj, Puri, Sambalpur and Sundargarh districts	Moderate to Severe	-	(i) Intercultural operations delayed. (ii) Rice plants withered beyond redemption. (iii) 75% of paddy and other crops in 741 villages lost. (iv) About 21 lakh tonnes of early varieties of rice and millets lost. (v) Agricultural and landless farmhands hit hard. (vi) Acute shortage of drinking water and cattle fodder. (vii) Power-cut imposed due to fall in water level in Hirakud and Balimela reservoirs and working of industrial units adversely affected. (viii) Total loss to Kharif crops Rs. 242/- crores.	16.	Ju we 1st 4th (2r wee
12.	Jul. (2nd, 3rd & 4th week), Aug. & Sep.	<u>PUNJAB</u> Amritsar, Bhatinda, Ferozepur, Gurdaspur districts	Moderate to Severe	-	(i) 40% of paddy and cotton crops destroyed. (ii) Loss estimated Rs. 200 crores.		
13.	Jul. (2nd, 3rd & 4th week), Aug. (2nd, 3rd & 4th week) & Sep.	<u>RAJASTHAN</u> Alwar, Bharatpur, Bikaner, Churu, Ganganagar and Jhunjhunu districts	Moderate to Severe	-	(i) Jowar, maize and millet/crops perished. (ii) Two crore people in 33,000 villages affected. (iii) Acute shortage of drinking water and cattle fodder. (iv) Estimated loss to crops Rs. 200 crores.		

(1)	(2)	(3)	(4)	(5)	(6)
Agricultural crores.	14.	<u>TRIPURA</u> Entire State	Mild	-	Half the area of Aus and Boro paddy crops destroyed.
r and Kanjha- was paddy. s did not e have been destroyed.	15.	<u>UTTAR PRADESH</u> Agra, Aligarh, Allahabad, Banda, Bareilly, Bijnor, Badaun, Bulandshahr, Etah, Gaziabad, Gazipur, Hamirpur, Hardoi, Jhansi, Jalaun, Kanpur, Lalitpur, Lucknow, Mainpuri, Mathura, Meerut, Mirzapur, Moradabad, Muzaffarnagar, Rampur, Saharanpur, Shahjahanpur, Unnao and Varanasi districts	Moderate to Severe	(i) 24 starvation deaths reported due to near famine conditions. (ii) Large number of cattle-heads peri- shed due to fodder scarcity.	(i) About 60%-75% Kharif crop in 7.4 million hectares damaged. Paddy and sugarcane worst affected while maize partially affected. (ii) Realisation of agricultural dues sus- pended from farmers. (iii) Wells and ponds dried up. (iv) Scarcity of cattle fodder and drinking water. (v) A three hour power-cut imposed (vi) Villagers migrated to urban areas for sustenance. (vii) Loss estimated Rs. 700 crores.
) Rice plants addy and othe lakh tonnes t. (v) Agri- (vi) Acute er. (vii) el in Hirakud ustrial units arif crops	16.	<u>WEST BENGAL</u> Bankura, Birbhum, Malda, Midnapore and Purulia districts	Moderate to Severe	-	(i) Transplantation of paddy crop delayed. (ii) Aman crop in 70% area destroyed and sugarcane crop in 1,250 hectares damaged. (iii) Acute shortage of drinking water and cattle fodder (iv) Crops worth Rs. 225 crores lost.
l. (ii) Loss					
) Two crore) Acute ler. (iv)					

Towns under thunderstorm

Sea crisis under Gale

Criteria

TABLE - V : SQUALLS

(1)	(2)	(3)	(4)	(5)	(6)	(7)
1.	6 Feb.	Nagpur	Severe (Wind speed 80 kmph)	-	Normal life paralysed, power failure, trees uprooted	
2.	17 Feb.	Nagpur	Severe (Wind speed 130 kmph)	An uprooted tree killed a woman with a child and four persons seriously injured.	-	21 May
3.	29 Apr.	Patna, Danapur, Muzaffarpur and Vaishali districts	Severe	20 persons killed due to house collapses/electrocution	Road traffic, power/water supply and telephone system completely disrupted. One motor launch sunk in mid-Ganga.	20 Jun.
4.	5 May	Kamalpur (Lakhimpur district)	Severe	-	A high school building damaged, power supply disrupted.	10 Jul.
5.	12 Jun.	Chandigarh and neighbourhood	Severe (Wind speed 170 kmph)	7 persons died and 20 injured	Power supply, telephone services, road traffic completely disrupted, trees uprooted.	
6.	16 Jun.	Wankar (Rajkot district)	Severe (Wind speed 120 kmph)	25 persons injured	Roofs blown off, electric poles and a large number of trees uprooted. Total loss to property Rs. 10 lakhs.	5 Jun. 17 Jun.
7.	20 Jun.	Dosa (Jaipur district)	Severe	2 women injured in house collapse	Trees and telephone poles uprooted.	25 Jun.
8.	21 Jun.	New Delhi	Severe (Wind speed 120 kmph)	2 persons crushed to death and 2 injured under falling trees uprooted by strong winds.	One helicopter overturned at Safdarjung airport.	19 Aug.
9.	26 Sep.	Ahmedabad	Severe (Wind speed 90 kmph)	One woman killed, dozen injured	Few houses collapsed, trees and electric poles uprooted.	16 Sep. 19 Sep.

Light ≤ 50
 Moderate 51 to 79
 Severe > 80

Thunder storm in thunderstorm

22 Sep.
 25 Oct.
 5 Nov

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
TABLE - VI : GALE							
CRITERIA							
Strong : Wind speed \geq 75 kmph.							
1.	1 Feb.	Bolangir and Sambalpur districts	Strong	2 persons killed	Damage to (i) Private houses (Rs.0. lakhs), (ii) Public utilities (Rs.0 lakhs), (iii) Crops (Rs. 8.82 lakhs in 3,250 hectares.	1.	18 Ma
2.	1,2 & 3 May	Erode and neighbourhood	Strong	2 persons died in house collapse	Trees and telegraph poles uprooted	2.	28 Ma
3.	2 May	Tarikere (Chickmagalur district)	Strong	-	Hundreds of coconut trees uprooted, several houses damaged.	3.	1 Apr
4.	9 May	Vilappilsala (Trivandrum district)	Strong	-	2 school buildings and some shops damaged. Total loss Rs. One lakh.	4.	22 Ap
5.	11 May	Madras	Strong	-	Power supply disrupted, trees uprooted, advertisement hoardings destroyed, roofs blown off, air services delay	5.	1 May
6.	May (4th week)	Lucknow, Banda and Barabanki districts	Strong	-	Widespread damage to standing mango crops	6.	7 May
7.	9 Jun.	Khandwa	Strong	One person died under wall collapse	Electric poles bent, telephone services dislocated.	7.	30 May
8.	22 Jun.	Alleppey, Kottayam, Erna- kulam and Koshikode districts.	Strong	One fisherman died in boat capsized.	Houses and buildings damaged, trees uprooted	8.	5 Jun.
9.	8 Jul.	Nagpur	Strong	-	Electric poles uprooted, power supply disrupted.	9.	11 Jun
10.	6,7 Aug.	Cannanore district	Strong	-	Plantain crops damaged, trees uprooted	10.	19 Jun
11.	29 Aug.	Bombay	Strong	-	Overhead power supply of suburban work between Ghatkhopar and Vikhrol disrupted.		
12.	26 Sep.	Ahmedabad	Strong	One woman electrocuted and six injured in house collapse	Roof tops blown off, trees uprooted		
13.	27 Sep.	Baroda	Strong	-	House collapses, uprooting of trees roof blown off, vehicular traffic disrupted.		

(1)	(2)	(3)	(4)	(5)	(6)
TABLE - VII : DUST-STORM					
<u>CRITERIA</u>					
Moderate : Windspeed between 39 to 74 kmph and horizontal visibility upto 500 metres.					
Severe : Windspeed \geq 75 kmph and horizontal visibility upto 50 metres.					
er failure,	21 May	Jhansi district	Severe	11 persons died	Several trees, electric and telephone poles, tin sheds and roof tops swept away. Mango and vegetable crops damaged.
upply and r disrupted. d-Ganga.	20 Jun.	Udaipur	Severe	1 person died, 1 injured	Many trees uprooted and telephone poles bent
ged, power	10 Jul.	Sonepet and its surroundings (Rohtak District)	Moderate	-	Several trees uprooted, tin roofs blown off.
ervices, road d, trees	TABLE - VIII : LIGHTNING				
oles and a ted. Total hs.	5 Jun.	Sinnar (Nasik district)		2 bullocks killed	-
prooted.	17 Jun.	Tezpur		1 person killed and 3 injured	-
t Safdarjung	25 Jun.	Shivampet (Rohtak district)		2 men died and one woman injured	-
and	19 Aug.	Chargaon (Raisen district)		1 woman killed	-
	16 Sep.	Kandukur (Prakasan district)		-	A college building damaged
	19 Sep.	i) Roha (Kolaba district)		2 persons killed, 1 injured.	Tin roof got burst and a tree bifurcated vertically.
		ii) Sudhagad (Kolaba district)		2 persons killed,	-
	22 Sep.	Amanatpur - Tokoda (Akola district)		2 boys killed	-
	26 Oct.	Kusumwadi, Rajewadi (Nasik District)		2 persons killed	-
	5 Nov	Indi (Bijapur district)		3 persons killed and 3 injured	-

(1) (2) (3) (4) (5) (6)

TABLE - IX : THUNDERSTORM

CRITERIA

Moderate : Loud peals of thunder with frequent lightning flashes, moderate to heavy rains and maximum wind speed 29 to 74 kmph.

Severe : Continuous thunder and lightning, heavy rains and maximum wind speed > 75 kmph.

houses (Rs.0.4 lakhs) utilities (Rs.0.82 lakhs)	1.	18 Mar.	Agartala and its surroundings	Severe	5 persons killed, 50 injured	-
houses uprooted	2.	28 Mar.	Silchar and Lakhimpur	Severe	2 persons killed, few others injured	Several houses damaged, extensive damage to crops, power/telecommunication service affected
some shops destroyed, One lakh.	3.	1 Apr.	Mathurapur (Assam)	Moderate to Severe	-	G.I. sheet roofs blown off, trees uprooted
trees uprooted, destroyed, services delayed	4.	22 Apr.	Mangaldoi and its suburbs	Severe	One boy killed	Tin roofs blown off, severe damage to private and govt. buildings, trees uprooted, electric/telephone/telegraph lines damaged.
standing mango	5.	1 May	Agartala	Severe	53 persons injured in three hundred house collapses and uprooting of trees	-
telephone	6.	7 May	Gauhati	Moderate to Severe	12 persons injured in house collapse	Tin roofs of a college building blown off, trees uprooted, power supply and telecommunication services disrupted.
houses, trees	7.	30 May	Pune	Severe	4 cattle died	-
power supply	8.	5 Jun.	Sinnar (Nasik district)	Moderate to Severe	-	Trees uprooted, roof tops blown off.
trees uprooted, suburban/neighborhood and Vikhrol	9.	11 Jun.	Baramulla district and Tral area (J & K)	Moderate	A lady passenger and the horse of a tonga died on the spot.	Roofs blown off, trees uprooted
houses uprooted	10.	19 Jun.	Durg	Severe	-	Uprooting of several electric and telephone poles. Trees/huts/roofs damaged.
falling of trees near traffic						

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
11.	25 Jun.	Jabalpur	Severe	Two persons injured under an uprooted tree	Telecommunication services disrupted	9.	Feb. (1st & week)
12.	14 Jul.	Poonch	Moderate	-	3 houses collapsed, traffic on Jammu-Rajouri road dislocated.		

TABLE - X : HAILSTORMS

						(1)	(2)
						10.	14-15
						11.	15 Feb
<u>CRITERIA</u>							
Slight : Sparse, usually small in size and often mixed with rain							
Moderate : F ail abundant enough to whiten ground							
Heavy : Includes at least a proportion of large stones.							
1.	14-15 Jan.	Bundi, Jhalawar and Jaipur districts	Moderate	Some animals and birds killed	Standing crops damaged, hailstones of lemon size reported in Bundi.		
2.	17 Jan.	Warasoni (Balaghat district)	Moderate	-	Standing rabi and vegetable crops badly damaged, trees uprooted.	12.	17 Feb
3.	21 Jan.	Chandur (Amraoti district)	Moderate	-	Standing crops worth Rs. 6 lakhs and houses damaged, communication disrupted.	13.	6,7,12, 14,17
4.	23 Jan.	(i) Narkhed (Nagpur district)	Moderate	-	Hailstones of mango size damaged extensively standing crops.	14.	19 Feb
		(ii) Badawar (Bewa district)	Moderate	-	Considerable damage to wheat, gram and masur crops.	15.	20 Feb
5.	29 Jan.	(i) Nasik & Deolali	Moderate	-	Damages to vegetable crops.	16.	4 Ma:
		(ii) Sitapur & Gorakhpur districts	Moderate	Several thousand birds perished	Crops worth several lakhs of rupees completely destroyed.	17.	6 Ma:
6.	6 Feb.	(i) Nagpur	Moderate	-	Normal life paralysed, trees uprooted.		
		(ii) Jhansi	Moderate	Several birds and animals died	Standing crops damaged.		
7.	8-9 Feb.	Shohratgarh (Basti district)	Moderate	-	Standing crops in 100 villages destroyed		
8.	14 Feb.	(i) Burhanpur (Khandwa district)	Moderate	One girl killed and ten injured	Cotton, wheat and gram crops damaged, roof tops blown off, trees uprooted, 200 families affected (Hailstones weighing 50-200 gms. reported).	18.	7 Ma:

	(1)	(2)	(3)	(4)	(5)	(6)
Disrupted			(ii) Jamnagar district	Moderate	Number of sheep and birds killed	Standing rabi and vegetable crops damaged.
on Jammu-	9.	Feb. (1st & 2nd week)	Nagpur, Amraoti, Bhandara and Chandrapur districts	Moderate to Heavy	9 persons killed	Standing crops in 1.70 lakh hectares badly damaged. Total loss to crops estimated Rs. 2 crores. 2,355 villages affected, 128 houses devastated, 4447 houses partially damaged. Havoc to Orange/cotton cultivation.
	10.	14-15 Feb.	Tonk, Banswara and Sawai Madhopur	Slight	-	Standing crops damaged.
	11.	15 Feb.	(i) Hinganghat (Wardha district)	Heavy	-	Property (huts, shops) and crops in 800 sq.km. damaged. Electric, telegraph poles and trees uprooted.
Disturbances of i.			(ii) Raver and Yawal (Jalgaon district)	Heavy	-	Damage to crops worth few lakh rupees.
crops badly	12.	17 Feb.	Roorkee (Saharanpur district)	Slight	-	Standing crops damaged.
lakes and n disrupted.	13.	6,7,12,13, 14,17 Feb.	Akola district	Moderate to Heavy	3 persons died, 84 heads of cattle perished	Standing crops in 5822 hectares and several houses damaged. Total loss estimated at Rs. 8.7 lakhs.
aged	14.	19 Feb.	Lucknow and Etawah districts	Moderate	Several animals died	Standing crops damaged.
, gram and	15.	20 Feb.	Kanpur and Farrukhabad districts	Moderate	-	Standing crops damaged.
rupees	16.	4 Mar.	Dabra Block (Gwalior district)	Moderate	-	Standing rabi crops in 50 villages completely damaged.
uprooted.	17.	6 Mar.	(i) Sawai Madhopur, Ratangarh and Jaipur	Moderate	Thousands of sheep died	Standing crops damaged.
es destroyed			(ii) Pakasma (Rohtak district)	Heavy	-	Green fields turned into a waste land.
damaged, uprooted, tones i).	18.	7 Mar.	Sonepat (Rohtak district)	Heavy	-	Extensive damage to standing rabi crops, loss estimated at Rs. One crore.

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
19.	9 Mar.	(i) Some villages in Jullundur district	Heavy	-	Wheat crops in 23,000 hectares damaged loss estimated Rs. 10 crores, Fodder crops worth Rs. 2 lakhs lost.	52.	23 Oct
		(ii) Boli (Sewai Madhopur district)	Slight	-	Standing crops damaged.	53.	30 Dec
20.	16 Mar.	Hamirpur	Moderate	-	Standing crops damaged.		
21.	25 Mar.	Peethampur (Bilaspur district)	Moderate	5 persons killed under an uprooted tree, 21 injured	-		
22.	4 Apr.	Jhunjhunu district	Moderate	A large number of birds died	Standing-wheat and gram crops damaged.	1.	12-13
23.	14 Apr.	(i) Kolhapur	Moderate	-	Power supply disrupted.		
		(ii) Mahabaleshwar (Satara district)	Moderate	-	Fruit trees uprooted, loss to property Rs. 10 lakhs.		
24.	19 Apr.	Sopore (J & K)	Moderate	One person died	Few houses and orchards damaged.		
25.	26 May.	Salem	Moderate	-	Several trees uprooted causing vehicular obstruction on many roads, power supply disrupted.		
26.	28 May.	(i) Raisen	Moderate to Heavy	One woman killed 4 children injured	Houses and buildings damaged.		
		(ii) Sultanpur (Raisen district)	Moderate to Heavy	One woman and four cattle heads killed	Heavy loss to government farm.		
27.	May (3rd week)	Simla and adjoining areas	Moderate	-	Apple crops damaged.		
28.	30 May	Vadia (Amreli district)	Moderate	-	Power supply disrupted.		
29.	31 May	Pune	Moderate	-	Power supply/vehicular traffic disrupted		
30.	15 Sep.	Anantnag, Baramulla, Ladakh and Srinagar districts	Heavy	One person killed in Nawab-Bazar	Hailstone of cherry size reported. Hailstones weighing 100-150 gms. experienced, loss to standing crops worth Rs. 3 crores. 329 villages badly affected.		
31.	20-21 Sep.	Badgam and Phagh blocks (J & K)	Moderate	-	Damage to paddy crops/apple orchards.		

(1)	(2)	(3)	(4)	(5)	(6)
52.	25 Oct.	Nasik, Dhule and Jalgaon districts.	Moderate	-	Damage to standing crops
53.	30 Dec.	Phulpur (Allahabad district), Nainital and Simla	Moderate	-	Standing crops damaged.

TABLE - XI : CYCLONIC STORMS

		Details of loss of life and damage to property structure etc.						REMARKS		
		Name of district	Human life	Cattle [✓]	Other Livestock	No. of houses damaged	No. rendered homeless			
Crops damaged to property damaged. Singing vehicular power supplied. arm. fic disrupted reported. gms. ng crops wo badly affected orchards.	1. 12-13 May*	COASTAL ANDHRA PRADESH (Landfall near Gogole on 12th evening)	Severe	Cuddapah & Chittoor	5	-	-	-	1) Gales with speed 100-160 kmph reported. (ii) Electric poles twisted and bent resulting in disruption of road, telecommunication and power links. (iii) Extensive damage to rail tracks by swollen rivers. (iv) Two bridges washed away. (v) Several trees uprooted (vi) Tidal waves of 3-5 metres affected the coastal areas.	
				East Godavari	-	6	40	2,000		8,000
				Guntur	16	1,123	467	10,000		24,000
				Kurnool	10	20,034	56,658	7,800		-
				Mahbubnagar	11	21,488	49,386	21,000		53,000
				Nellore	79	13,329	2,11,020	2,66,000		13,00,000
	Prakasam	486	30,694	1,58,984	2,62,000	11,00,000				
		* Note : This is the first time during the last 100 years that in the month of May the cyclonic storm formed at a latitude as low as 7°N.						LOSSES		
								(1) Loss of life : 607 (ii) Crop land inundated by sea water : 26,860 hectares. (iii) Loss to Railways : Rs. 4 crores. (iv) Revenue loss : Rs. 10 crores. (v) Loss to state electricity board : Rs. 14 crores. (vi) Loss to telecommunication : Rs. 18 lakhs (vii) Loss to educational institutions : Rs. 7 crores. (viii) Loss to tobacco industry : Rs. 100 crores. (ix) Loss to handloom industry : Rs. 67.5 crores. (x) Loss to small scale (650 units)/large scale (11 units)/Artisan (1100 units):		

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)	
					Rs. 1 crore/Rs. 5.17 crores/Rs. 57 lakhs. (xi) Total loss to crops, property and structures : Rs. 681 crores.	1.	15,16 ar 25 Nov.	
2.	7-8 Aug.	<u>ORISSA COAST</u> (Landfall near Balasore on 7th night)	Severe	Balasore Cuttack Keonjhar Mayurbhanj Puri	One person drowned - - - One person died in house collapse	(i) Several areas submerged (ii) School/Private houses damaged. (iii) Paddy crop to 450 hectares submerged, (iii) Telephone/Telegraph services disrupted. (iii) 22 houses collapsed. (i) 83 villages affected by floods (ii) Embankments of Kusal and Bhattaranga rivers breached. (iii) Road communication disrupted. (iv) 2,823 hectares of cultivated land affected. (v) 81 houses damaged. ✓ Two embankments breached (i) Paddy crops submerged. (ii) 5 houses damaged	2.	Oct. (1 2nd wee
3.	15-16 Nov.	<u>EAST CENTRAL ARABIAN SEA</u> (The storm dissipated off Saurashtra coast)				(i) Widespread rains in Goa, Konkan, Gujarat, Saurashtra and Kutch. (ii) A fishing trawler sank in "Gulf of Cambay" and crew rescued by ONCC ship.	3.	30 Jun
4.	24-25 Nov.	<u>SOUTH COASTAL ANDHRA PRADESH</u> (Landfall near Sriharikota on 25th afternoon)				(i) Widespread rain over Tamilnadu, Coastal Andhra Pradesh, Rayalaseema and Telangana. (ii) Plying of boats became impossible due to rough seas in Pulicat area, north of Madras.	4.	Jul.(1
							5.	Jul.(
							6.	Sep.

(1)	(2)	(3)	(4)	(5)	(6)
<u>TABLE XII - FLOODS AND HEAVY RAINS</u>					
		<u>ANDHRA PRADESH</u>			
1.	15,16 and 25 Nov.	Chittoor, Guntur and Krishna districts	Heavy rains	-	(i) Groundnut crop suffered heavy damage. (ii) Paddy crop about to be harvested adversely affected. (iii) Loss estimated Rs. 8 crores.
		<u>ARUNACHAL PRADESH</u>			
2.	Oct. (1st & 2nd week)	Lohit district	Flash floods in Lohit river	(i) 5 persons killed (ii) Hundreds of domestic animals washed away.	(i) Road and telecommunication disrupted due to heavy landslides. (ii) Three bridges washed away. (iii) Number of villages in low lying areas inundated. (iv) Part of Tezu town damaged.
		<u>ASSAM</u>			
3.	30 Jun.	Gauhati	Heavy rains	-	submerged. (i) Hundreds of houses submerged (ii) Road communication disrupted.
4.	Jul. (1st week)	Cachar, Darrang, Dibrugarh, Lakhimpur and Sibsagar districts	Severe floods in Brahmaputra and its tributaries Dhansiri and Subansiri	3 persons died	(i) 3,000 families in 12 villages marooned (Mangaldai & Udalguri subdivisions worst affected). (ii) Several houses swept away because of erosion in the river banks (iii) Road/rail communication disrupted.
5.	Jul. (4th week)	Goalpara district	Moderate to severe floods in Brahmaputra & its tributaries	-	Vast areas of "Dhubri" town inundated.
6.	Sep. (2nd week)	Cachar district	Severe floods in Barak and its tributaries.	-	(i) 30,000 people rendered homeless. (ii) 500 villages with a population of 3 lakh badly affected. (iii) 6,000 houses either damaged or washed away. (iv) Surging flood waters entered Silchar, Karimganj and and Halakand towns.

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7.	Oct. (1st & 2nd week)	Darrang, Dibrugarh, Goalpara, Kamrup, Sibsagar and Nowgong districts	Severe floods in Brahmaputra and its tributaries	(i) 13 persons died in the waves of floods. (ii) Hundreds of cattles perished (iii) Vast areas of "Kaziranga" park famous for rhinos affected by floods. Several wild animals swept away.	(i) Extensive damage to standing crops and houses. (ii) Road and embankments breached at many points. (iii) Over 200 villages inundated and over one million people badly affected. (iv) Flood situation in Majuli island reported grave. (v) Oil towns of Duliajan, Naharkatiya and coal towns Margherita and Lado affected.	11 Aug.
<u>BIHAR</u>						
8.	Jul. (3rd & 4th week)	Darbhanga, Madhubani, Muzaffarpur, Saharsa, and Sitamarhi, Champaran districts.	Severe floods in Baghmata, Burhi, Gandak, Ghaghra, Kamala and Kosi rivers.	-	(i) 158 houses collapsed. (ii) Crops worth Rs. 2.85 crores in 16,000 hectares damaged.	11 Aug.
9.	Aug. (4th week)	Gopalganj, Muzaffarpur, Saharsa and Santal Parganas districts	Severe floods in Adhwara, Baghmata, Kamala and Kosi rivers	13 people drowned	(i) Sugarcane crop in 41 hectares destroyed. (ii) Standing Bhodal crop worth Rs. 3.6 lakh destroyed.	Nov. (3 week)
<u>GUJARAT</u>						
10.	14 and 15 Feb.	Ahmedabad, Banaskantha, Bhavnagar, Jamnagar, Mehsana, Sabarkantha, Surendranagar and Valsod districts	Heavy rains (unseasonal)	-	(i) Major damage to cotton, garlic, mustard, potato, cumin seed and wheat crops. (ii) Loss estimated to Rs. 2.45 crores.	May (4
11.	7 Aug.	Ahmedabad, Junagadh and Rajkot districts	Heavy rains	2 people died and 18 injured in house collapses.	(i) Several kuchcha huts collapsed. (ii) Trees uprooted.	Jul. (
12.	Aug. (2nd week)	Ahmedabad, Jamnagar, Kutch, Rajkot and Surendranagar districts	Heavy rains	(i) 47 people drowned in Gulf of Kutch and 4 in Nagmati river. (ii) 25,000 heads of cattle killed and 50,000 sheep and goats perished.	(i) Maliya town and 15 villages completely marooned. (ii) Rail track near Maliya severely damaged. (iii) 30 villages affected among them Lilapur and Adepar completely wiped out. (iv) Many open wells silted and pump sets either burnt or damaged. (v) Several agricultural implements washed away. Standing crops in 1 lakh hectares damaged.	2 Aug
						3, 4
						13 S

	(1)	(2)	(3)	(4)	(5)	(6)
crops kments Over one (iv) re- aliajan, rita	3.	11 Aug.	Broach	Moderate floods in Narmada river	-	(i) Low-lying areas submerged (ii) Water supply remained suspended. (iii) Normal city life disrupted.
ops	4.	11 Aug.	Morvi (Rajkot district)	Flash floods in Machchu river	1,485 people died in floods in Morvi town, when Machchu dam II breached.	(i) Water level was about 6 metres at some places in Morvi. (ii) Carcasses seen hanging on electric/telephone wires. (iii) Road-cum-rail bridge at Morvi severely damaged. (iv) 8,000 houses damaged. (v) Number of small scale industrial units wiped out. (vi) Power/telephone services completely cut-off. (vii) Total loss to public/ private property estimated Rs. 103.3 crores.
des- worth	5.	Nov. (3rd & 4th week)	Saurashtra region	Heavy rains (unseasonal)	-	(i) One lakh people in 35 villages affected. (ii) Floods in Bhader and Bhogave rivers damaged standing crops of cotton, gram, groundnut, jowar and wheat. (iii) Loss estimated Rs. 50 crores.
'eat	6.	May (4th week)	<u>JAMMU & KASHMIR</u> Hilly areas	Heavy rains	8 people including a woman and a child killed	A tourist bus washed away and passengers escaped with minor injuries.
plete- aliya	7.	Jul. (2nd week)	Jammu	Heavy rains	-	(i) 70 houses collapsed. (ii) Road traffic suspended.
par n wells r ple- 11	8.	8, 9 Aug.	Vijagam and Tealbal	Heavy rains	-	Paddy crops destroyed.
	9.	2 Aug.	<u>KARNATAKA</u> Bantwal (South Kanara district)	Moderate floods in Netravati river.	-	National high-way flooded and communication disrupted.
	20.	3, 4 Aug.	Manjangud (Mysore district)	Severe floods to in Kabini river	-	(i) People in low-lying areas evacua- ted. (ii) Paddy fields submerged.
	21.	13 Sep.	(i) Bangalore	Heavy rains	Two children drowned when low lying areas flooded	12 houses and 2 huts damaged.
			(ii) Rugi (Bijapur district)	Heavy rains	5 people died in house collapse.	-

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
22.	16 Sep.	Gudibanda (Kolar district)	Moderate flood in Kushavati river	-	(i) Heavy damage to standing crops due to breaches in tanks. (ii) Loss estimated Rs. 2.5 lakhs.	34.	25 Ju
23.	25 Sep.	Saundatti (Belgaum district)	Heavy rains	-	30 houses collapsed, affected families shifted to safer areas.	35.	1 Jul
24.	Sep. (4th week)	Tarapun (Bijapur district)	Severe floods in Bhima river	-	600 people marooned by flood waters.	36.	3 Aug
25.	8 Oct.	Bangalore	Heavy rains	A child killed and 20 injured in house collapses	Low lying areas flooded and slums submerged.		
26.	16 Nov.	Asundi (Hubli district)	Heavy rains	About 1,500 sheep grazing in a field washed away	-	37.	Oct. (
<u>KERALA</u>							
27.	10-19 Jun.	Alleppey district	Heavy rains	-	186 hectares of paddy cultivation destroyed,	38.	Jan. (
28.	14 Jun.	Cochin	Heavy rains	-	(i) Vehicular traffic/air services disrupted. (ii) Operations in port came to a standstill.		& Feb 2nd v
29.	2 Jul.	Cannanore district	Heavy rains	One woman and three children died	A bridge and an approach road washed away.	39.	24 Ju
30.	29-31 Jul.	Kozhikode district	Heavy rains	-	(i) 60 coconut trees uprooted and 4 houses partially damaged. (ii) 61 hectares of paddy field flooded. (iii) Coastal area affected by sea-erosion.	40.	8 Jul
31.	1-5 Aug.	Cannanore and Kozhikode districts	Heavy rains	(i) One woman and two children killed in house collapses. One person drowned in boat capsized. (ii) Several cattle heads washed away.	(i) 30 houses washed away and 1000 families affected. (ii) Banana, ginger and paddy crops affected.	41.	Aug. (
32.	6,7 Aug.	Cannanore district	Heavy rains	One woman drowned in swollen river	(i) Roads and bridges damaged. (ii) Trees uprooted. (iii) Plants and crops damaged.	42.	3,4
33.	15-19 Nov.	Palghat district	Moderate floods in Kalpathi river	-	(i) 17 irrigation bunds damaged. (ii) Besides damage to crops, 50 huts washed away. Loss estimated to Rs. 1 crore.		

	(1)	(2)	(3)	(4)	(5)	(6)
			<u>MADHYA PRADESH</u>			
rops due to estimated	34.	25 Jun.	Bhikangaon (Khargone district)	Heavy rains	31 people died and 13 drowned in a flooded nullah in a bus skidding	-
families	35.	1 Jul.	Khargone district	Heavy rains	Two girls died in house collapse.	
nters.	36.	3 Aug.	Indore	Heavy rains	(i) One woman and two child- ren buried alive in wall collapse (ii) One boy washed away in strong current of a nullah.	(i) Low lying areas flooded. (ii) City reservoir overflowed.
ms	37.	Oct. (2nd week)	Dewas, Mandasur, Ratlam, Shajapur and Ujjain dis- tricts	Erratic rains	-	38% to 50% Kharif crops damaged.
on			<u>MAHARASHTRA</u>			
ces dis- t came to	38.	Jan. (4th week) & Feb. (1st & 2nd week)	Amraoti, Bhandara, Chand- rapur, Nagpur and Wardha districts	Heavy rains (Unseasonal)	(i) 9 people died. (ii) 84 heads of cattle perished	(i) Cotton, gram, orange, orchards, vegetables and wheat crops in 70,000 hectares damaged. (ii) 1,200 houses damaged. (iii) 6,000 villages affected.
washed	39.	24 Jun.	Bombay	Flash floods	Two children died in house collapse	(i) Several areas flooded (ii) Train services/telephone services/road transport disrupted.
nd 4 61 l. (iii) osion.	40.	8 Jul.	Katol (Nagpur district)	Heavy rains	-	(i) 59 houses collapsed and 84 damaged. (ii) 374 people affected.
000 ginger	41.	Aug. (1st week)	Buti-Bori and Choti-Bori (Nagpur district)	Severe floods in Wunna river	(i) 5 persons washed away. (ii) Two persons killed & 26 seriously injured in a train accident due to breaches. (iii) Large number of cattle heads perished.	(i) Four trucks washed away. (ii) One bridge washed away. (iii) Vehicular traffic between Nagpur and Wardha sus- pended due to inundation of bridges and culverts. (iv) 2,000 houses damaged. (v) Loss estimated to Rs. One crore.
(ii) nd crops	42.	3,4 Aug.	Nagpur and Wardha districts	Heavy rains	10 persons died	(i) Few trucks/buses swept away. (ii) Several houses collapsed (iii) Damage to property/crops/animals and agricultural equipments run into several lakhs of rupees.
.. (ii) s washed ore						

(1)	(2)	(3)	(4)	(5)	(6)	(1)	(2)
43.	8-10 Aug.	Amraoti, Bhandara, Buldhana, Chandrapur, Nagpur, Wardha and Yeotmal districts	Flash floods	(i) 40 people died (ii) 2,128 heads of cattle perished	(i) People in 204 villages marooned. (ii) 12,380 houses collapsed. (iii) Thousands of people rendered homeless (iv) Standing crops in 75,000 hectares damaged. (v) Loss estimated to Rs. 8 crores.	51.	3,4
44.	Sep. (2nd, 3rd & 4th week)	Ahmednagar district	Heavy rains	-	(i) 2.5 lakh hectares of land inundated making it impossible for rabi sowing operations. (ii) Cotton crop in 80,000 hectares damaged beyond redemption resulting in an estimated loss over Rs. 60 crores.	52.	22
45.	16 Sep.	Pune	Flash floods	One girl killed and 6 injured in house collapse	-		
46.	25 Sep.	Aurangabad district	Flash floods	One child killed and 2 injured (Total death toll in house collapses during last three weeks of Sep.: 12)	-	53.	17
47.	27 Sep.	Solapur district	Moderate floods in Bhima, Man & Sina rivers	-	(i) Road traffic disrupted. (ii) Malewad village surrounded by flood waters.	54.	12, 2,
48.	4 Nov.,	Solapur	Moderate floods in Bhogawati river	Two children killed and 2 women injured in wall collapse	Traffic paralysed by floods in Bhogawati river.	55.	13
<u>NEW DELHI</u>							
49.	21 Feb.	New Delhi & surrounding areas.	Moderate floods in Yamuna river	-	(i) 15 villages in north Delhi affected by flood waters. (ii) Standing crops damaged.	56	22
<u>RAJASTHAN</u>							
50.	Jul. (2nd & 3rd week)	Ajmer, Bhilwara, Bundi, Jalore, Jodhpur, Kota, Nagaur, Pali, Sawai Madhopur, Sikar & Tonk districts.	Severe floods in Loni river following unprecedented heavy rains.	(i) 350 people died and 231 reported missing. (ii) Two lakh livestock perished.	(i) 211 villages inundated and 40,000 sq.km. area submerged due to breaches in number of dams. (ii) Two passenger trains marooned due to breaches and submersion of rail tracks in Pali/Jodhpur districts.	57.	19

(1)	(2)	(3)	(4)	(5)	(6)
ned. i) less tares . 8	51. 3, 4 Aug.	Barmer, Jalore, Jodhpur, Nagaur & Pali districts	Severe floods in Luni river	-	(iii) Nearly one million people affected (iv) Several houses collapsed. (v) Loss estimated to Rs. 60 crores. (i) Relief operations disrupted, bring- ing fresh misery to hundreds of thousands of people whose houses were damaged. ✓ (ii) Reservoirs and bunds overflowed. <i>ed</i>
dated ing 30,000 1 er	52. 22 Jul.	<u>SIKKIM</u> Gangtok	Incessant heavy rains	A woman and a child washed away in flood waters of Bakchachu river.	✓ Road communication between Gangtok- Siligiri snapped due to massive land- slides.
		<u>TAMILNADU</u>			
	53. 17 & 23 Nov.	Coimbatore district	Heavy rains	18 people died in house collapse at Pollachi.	(i) 1,500 huts damaged. (ii) 6,500 peo- ple rendered homeless. (iii) Loss estimated to property Rs. 3 lakhs.
	54. 12 May, 2, 13 Nov.	Madras	Heavy rains	4 persons killed in hut collapses and three injured	✓ (i) Normal life disrupted. (ii) Train/Air services delayed.
alewadi k	55. 13, 19, 20 Nov.	Madurai district	Severe floods in Vaigai river	19 persons died in house collapses	(i) The bridge across the river submerged (ii) Several tanks breached. (iii) Heavy breaches in rail-tracks dislocated train services (iv) 4,000 persons in Pettai Thennur villages marooned and food air- dropped. (v) Residential areas flooded and 1,500 people rendered homeless. (vi) Power failure (vi) Normal life dislocated.
oga-	56. 22 Nov.	Pudukottai district	Heavy rains	-	(i) 170 tanks breached. (ii) 200 villages water-logged.
ected ps	57. 19 Nov.	Ramanathapuram district	Heavy rains	34 people died	(i) People in ⁷ villages marooned, food air- dropped (ii) 800 houses/5,000 huts da- maged. (iii) 31000 people rendered home- less. (iv) Several irrigation sources breached. (v) Heavy damage to road bridges.
000 ches in nd sub hpur					

(1)	(2)	(3)	(4)	(5)	(6)
58.	13,18 & 20 Nov.	South Arcot district	Heavy rains and Gadilam river in spate	Nine people died	(i) Mining operations in Lignite mines at Neyveli handicapped. (ii) 45 villages water-logged and people in 10 villages marooned. (iii) 12,140 hectares of paddy crop flooded. (iv) Vehicular traffic disrupted because of uprooting of trees and several breaches (v) 50 huts washed away.
59.	23 Jul, 13,18 Nov.	Thanjavur district	Heavy rains	3 persons died in house collapse	(i) Agricultural work hampered. (ii) Paddy crop in 2,855 hectares submerged. (iii) 120 houses damaged. (iv) 257 families affected.
60.	13,17,19, & 20 Nov.	Nilgiris district	Heavy rains and flash floods in Noyyal and Bhavani rivers	18 human lives lost in heavy landslides	(i) Vehicular traffic affected by landslides in ghat roads. (ii) 40 huts submerged. (iii) Extensive damage to property.
61	13,19,21 & 22 Nov.	Tiruchirapalli district	Heavy rains and moderate floods in Cauvery/ Colaroon-Amaravathi rivers.	9 people died in house collapse	(i) Over hundred huts washed away in flooded Amaravathi river. (ii) 2,500 people rendered homeless. (iii) 225 irrigation tanks breached.
62.	12,14 & 18 Nov.	Tirunelveli district	Severe floods in Chittor, Tambaraparani & Vaipar rivers	30 people died in wall collapse	(i) Bridge costing Rs. 23 lakh, under construction washed away. (ii) Road communication disrupted (iii) Power supply and telephone system seriously affected (iv) 167 irrigation sources breached. (v) 5,000 families in low lying areas rendered homeless. (vi) 2,800 huts washed away. (vii) 809 hectares of standing paddy crop submerged. (viii) Chillies, coriander seeds and cotton crops in 3,035 hectares damaged.
UTTAR PRADESH					
63	9 Mar.	Vishnuprayag (Garhwal district)	Heavy rains	-	Number of houses heavily damaged in flash floods.
64.	Jul. (2nd, 3rd & 4th week)	Azamgarh, Bahraich, Ballia, Bara-Banki, Basti, Chameli, Dehra Dun, Deoria, Faizabad, Gonda, Gorakhpur, Kheri and Sitapur districts	Severe floods in Burhi Gandak, Ghagra and Rapti rivers	11 human lives lost	(i) 6.24 lakhs people in 3,600 villages affected. (ii) crops in 99,014 hectares affected. (iii) 3,641 houses damaged (iv) Traffic dislocated.
65.	Aug. (2nd & 3rd week)	Azamgarh, Bahraich, Ballia, Basti, Deoria, Faizabad, Gonda, Gorakhpur and Kheri districts	Severe floods in Ghagra river	(i) 76 human lives lost. (ii) 222 cattle perished	(i) 21 lakh people in 3,950 villages affected. (ii) 8,924 houses damaged. (iii) 5.16 lakh hectares of cropped area affected.
WEST BENGAL					
66.	10 Jul.	Siliguri & adjoining areas.	Heavy rains	-	Four thickly populated villages inundated.
67.	6-8 Aug.	Howrah, Midnapore and 24 Parganas district	Moderate to severe floods in Ichamati, Kalandi, Matla and Vidyadhari rivers.	-	10,000 people in river side villages rendered homeless.

36°

32°

28°

24°