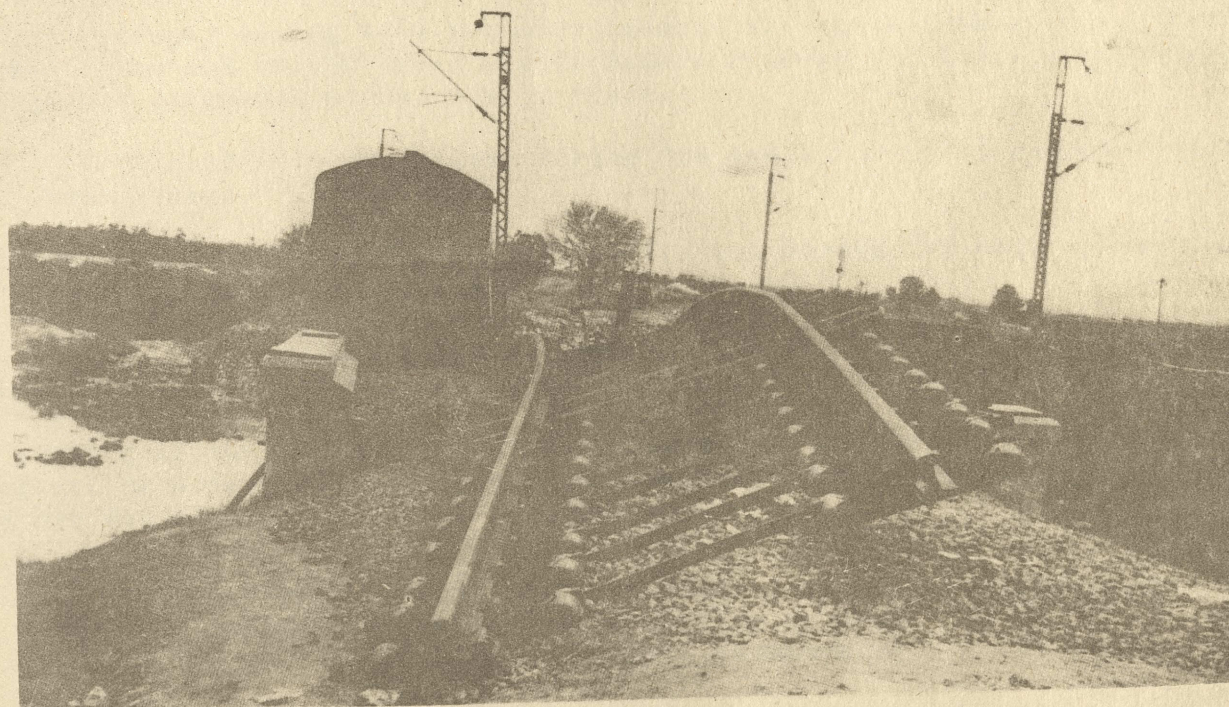




INDIA METEOROLOGICAL DEPARTMENT
DISASTROUS WEATHER EVENTS , 1984
A REPORT



ISSUED BY
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Cover Photo : Damage to Railway bridge near Pandluru Railway
gate in Nellore District due to tropical cyclone
in November - 1984.

DISASTROUS WEATHER EVENTS OF 1984

Nearly all the weather events caused damage to life and property during year 1984. The most noteworthy among them were the following :-

- (i) Severe flooding in many rivers of the country during the southwest monsoon season took a heavy toll of human lives and livestock. It also affected large areas of cultivated land, damaging kharif crops heavily. The most affected states were Assam, Bihar, Gujarat, Orissa, Tripura, Uttar Pradesh and West Bengal.
- (ii) During the monsoon period moderate to severe drought conditions prevailed in parts of Andhra Pradesh, Karnataka and Maharashtra affecting kharif crops severely.
- (iii) A Bay Cyclone, during 9-14 November crossed the south Andhra coast, took a toll of 658 human lives and 90,650 livestock in Andhra Pradesh and Tamilnadu. Damage to standing crops was estimated at Rs. 232.32 crore.
- (iv) The severe cold wave conditions during 3rd and 4th week of December over Bihar claimed 97 human lives.
- (v) Severe heat wave prevailed over Uttar Pradesh during 3rd week of May and 1st week of June and claimed 33 human lives.
- (vi) A tornado, swept across Pilge village in Ludhiana district of Punjab on 19 February. About 25 persons injured and 15 houses and 2 godowns damaged.

The summary of these natural hazards is based on the various reports in the India Meteorological Department and the press information. The areas affected by the weather phenomena are depicted on four maps (seasonwise).

I N D E X

<u>Table No.</u>	<u>Event</u>	<u>Page Nos</u>
I	Snowfall	1 - 2
II	Cold Wave	2 - 3
III	Heat Wave	4
IV	Drought	5 - 6
V	Squalls	7
VI	Gale	8
VII	Duststorm	8
VIII	Lightning	9 - 10
IX	Thunderstorm	10 - 11
X	Hailstorm	12 - 14
XI	Floods and Heavy Rains	15 - 38
XII	Cyclonic Storms	39 - 41

(1) Traffic on Jammu-Srinagar highway disrupted.

(ii) Roads in mountainous region of Jammu and Kashmir closed.

(i) Vehicular traffic in Srinagar and surrounding areas, disrupted.

Power supply and communication disrupted.

(i) 3 of the 29 new Javans trapped in snow at 5,200 metre high Batalik (Poonch district), reached by helicopter.

Thousands of passengers stranded for about 4 days on the national highway between Jammu and Srinagar, blocked at several places.

(iii) Telecommunication system disrupted.

(i) Baramulla district cut off from rest of the state.

(ii) Several roof tops of temporary dwellings blown away due to high gales.

S.N.	Date/Period	Area affected	Intensity	Casualties	Remarks
(1)	(2)	(3)	(4)	(5)	(6)

TABLE - I : SNOWFALL

CRITERIA

Moderate : 7.6 to 34.9 cm in 24 hrs.

Heavy : \geq 35.0 cm in 24 hrs.

Moderate 3 of 1000 stranded passengers died due to frost.

- (i) Traffic on Jammu-Srinagar highway disrupted.
- (ii) Roads in mountaineous region of Doda and Kishtwar closed.

Moderate

- (i) Vehicular traffic in Simla and surrounding areas, disrupted.
- (ii) Power supply and communication disrupted.

Heavy

- (i) 12 persons died in Gurez, Tangdhar, Uri and Nowgan.
- (ii) 10 Jawans reported missing and suspected dead in blizzards in Rajouri area.

- (i) 8 of the 29 army jawans trapped in snow at 4200 metre high Janiagali (Poonch district), rescued by helicopter.

- (ii) Thousands of passengers stranded for about 4 days as the national highway between Jammu and Srinagar, blocked at several places.

- (iii) Telecommunication system disrupted.

Heavy

25 persons died when avalanche swept away their houses.

- (i) Kinnaur district cut off from rest of the state.
- (ii) Several roof tops of temporary dwellings blown away due to icy gales.

1. 4-6 Feb. (a) Jammu & Kashmir

(b) Himachal Pradesh

2. 18-20 Feb. Jammu & Kashmir

3. 18-25 Feb. Himachal Pradesh

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

- (iii) National and State highways damaged at several points. Loss estimated to be Rs. 3 crore.
- (iv) Vehicular traffic, power supply and telecommunication system disrupted due to uprooting of many trees and snapping of the telecommunication lines.

TABLE - I : SNOWFALL

CRITERIA

Moderate : 7.6 to 34.9 cm in 24 hrs.
Heavy : 35.0 cm in 24 hrs.

4.	15 Mar.	Jammu & Kashmir	Moderate	2 persons killed and one person injured at Rang Payen (Kupwara district) due to avalanche.
5.	17 Mar.	Jammu & Kashmir	Moderate	2 persons died at Machel area (Kupwara district) due to avalanche.
6.	30 & 31 Dec.	Jammu & Kashmir	Heavy	

- (i) Banihal area worst affected.
- (ii) National highway between Jammu & Srinagar cut off.

TABLE - II : COLD WAVE

CRITERIA

Moderate : Night temperature 6 to 7°C. below normal.
Severe : Night temperature \geq 8°C. below normal.

1.	2 Jan.	Punjab	Moderate to Severe	One person died in Jalal village.
2.	2-9 Jan.	Chandigarh	Moderate	2 persons died.
3.	11 Jan.	Punjab	Moderate	One person died at Macchiwara.
4.	15-31 Jan.	Uttar Pradesh	Moderate to Severe	37 persons died in various parts of the state.

(1)	(2)	(3)	(4)	(5)	(6)
5.	17 Jan.	Haryana	Moderate	One person killed at Jhamarheri (Karnal district).	
6.	8 Feb.	Punjab	Moderate	One person died in Phagwara.	
7.	16 Feb.	Chandigarh	Moderate	One person died.	
8.	22 Feb.	Madhya Pradesh	Moderate	Vegetable and pulses damaged in Malwa region of Indore division.	
9.	29 Feb.	Madhya Pradesh	Moderate	Opium crop in Banpura, Kideswar, Budwa areas of Mandasaur division, damaged.	
10.	Dec. (3rd & 4th week)	Bihar	Severe	97 persons died in the State, death toll reported as follows:	
				Gaya	- 40
				Mokameh	} - 32
				Barouni	
				Industrial	
				Belt	
				Nawada	- 22
				Bokaro	- 1
				Hajaribagh	- 1
				Aurangabad	- 1
11.	20-31 Dec.	Punjab	Severe	4 persons died (2 in Amritsar and one each in Bhatinda and Sarala).	
12.	22-25 Dec.	North-West Uttar Pradesh	Severe	10 persons died.	

TABLE - III : HEAT WAVE

CRITERIA

Moderate : Day Temperature 6 to 7°C. above normal.
Severe : Day Temperature \geq 8°C. above normal.

(1)	(2)	(3)	(4)	(5)	(6)
1.	14-20 May.	Uttar Pradesh	Moderate	21 persons died in different parts of the state.	
2.	17 May.	Vidarbha region (Maharashtra)	Moderate	A young woman died in Nagpur.	
3.	20 May.	Punjab	Moderate	One person died in Mehta (Kapurthala district).	
4.	22 May.	Marathwada region (Maharashtra)	Moderate	4 persons in Nanded.	
5.	24 May.	Madhya Pradesh	Moderate	2 persons died and several other admitted in hospital in Balaghat district.	45°C. temperature recorded at Balaghat.
6.	25 May.	Marathwada region (Maharashtra)	Moderate	6 persons died in Aurangabad district.	
7.	26 May.	Andhra Pradesh	Severe	9 persons died (5 in Khammam district and 2 each in Krishna and Prakasam districts).	
8.	30 May.	Punjab	Moderate	2 persons died in Sangrur district.	
9.	1-4 Jun.	Uttar Pradesh	Moderate to Severe	12 persons died in Agra and Jhansi districts.	

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

TABLE - IV : DROUGHT

1.	Aug. & Sept.	<u>ANDHRA PRADESH</u> All districts (except Srikakulam, Visakhapatnam and Vizianagaram)	Severe	(i) Rayalaseema, Telangana and some parts of coastal Andhra Pradesh worst affected. (ii) The dry spell damaged Kharif crop worth about Rs. 830 crore.
		<u>KARNATAKA</u>		
2.	Aug. (2nd week) to Sep. (3rd week)	All districts (except Chickmagalur, Kodagu, Dakshina Kannada, Uttara Kannada and Shimoga districts)	Moderate to Severe	(i) 8651 villages in 100 talukas affected. (ii) 60% of the cropped area affected by drought. (iii) 7,37,655 small and marginal farmers and 1.03 million agricultural labourers affected. (iv) More than 5 million cattle affected due to shortage of fodder.
		<u>MAHARASHTRA</u>		
3.	Aug. (2nd week) to Sep. (1st week)	Marathwada and Vidarbha regions and Ahmednagar, Dhule, Nashik, Sangli and Satara districts in Western Maharashtra	Moderate to Severe	In Marathwada region, (i) 23.77 lakh hectares of cultivated land affected. (ii) Nanded district worst affected, where crops in 1185 villages withered. (iii) Heavy damage to groundnut and bajra crop reported. (iv) Acute drinking water shortage reported. In Latur district Majara river gone dry. In Vidarbha region, Kharif crop particularly Paddy damaged. The loss of crop, pulses, and cotton reported as follows :

(1)	(2)	(3)	(4)	(5)	(6)
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Cotton	Crop	Oil seeds
9 lakh bales valued around Rs.230 crore	2.1 million tonnes val- ued around Rs.330 crore	0.375 tonnes valued around Rs.200 crore

About 7 million people in 18,000 villages throughout Maharashtra affected due to poor kharif crop.

RAJASTHAN

4. 12-27 May South Rajasthan

Moderate
to Severe

100 villagers died due to water borne diseases as there was acute shortage of drinking water.

- (i) Drought conditions and acute shortage of drinking water prevailed in South Rajasthan.
- (ii) Many villagers forced to migrate to cities.

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

TABLE - V : SQUALLS

CRITERIA

Moderate : Surface wind speed (in gusts) upto 80 kmph.

Severe : Surface wind speed (in gusts) \geq 80 kmph.

1.	5 Apr.	Cachar and Karimganj (Assam)	Severe (100 kmph)	3 persons died and 50 injured.	Power supply and telecommunication services disrupted.
2.	21 Apr.	New Delhi	Moderate (70 kmph)	(i) 4 persons including 2 children electrocuted. (ii) One child injured when he touched a live wire fallen due to the storm.	
3.	12 & 13 May	Cuddapah and Kurnool (Andhra Pradesh)	Moderate		Market-yard, weavers' colony and R.T.C. garden at Nandikothur and Proddatur badly damaged.
4.	19 Jun.	New Delhi	Moderate	3 persons injured when (i) a tree fell on their (ii) house in Ashram colony.	Several houses and shops damaged. Few trees uprooted and telephone wires snapped, disrupting power supply.

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

TABLE - VI : GALE

CRITERIA

Strong : Wind speed \geq 75 kmph.

1.	2 & 3 Feb.	Ernakulam (Kerala)	Strong		(i) Several houses and shops in Kumbanadu and Pattimuttam areas damaged. (ii) Standing crop badly damaged. (iii) 2 big trees uprooted. (iv) Power supply and communication system disrupted.
2.	15 May.	Kozhikode (Kerala)	Strong	A woman killed under a fallen coconut tree.	Several houses damaged and many trees uprooted.
3.	17 May.	(i) Quilon (Kerala)	Strong	^a 10 workers in/tile factory injured when the roof top collapsed at Nedavathur.	
		(ii) Alleppey	Strong	A woman died at Thannarmukkam when a tree fell over her.	30 houses damaged.
4.	18 May	Cannanore (Kerala)	Strong	2 persons died in a house collapse.	Damage to public property estimated to be Rs.20 lakh.

TABLE - VII : DUSTSTORM

CRITERIA

Moderate : Wind speed between 39 to 75 kmph and horizontal visibility upto 500 metres.
Severe : Wind speed \geq 75 kmph. and horizontal visibility upto 50 metres.

NO DUSTSTORM EVENTS WERE REPORTED FROM ANY PART OF THE COUNTRY.

(1)	(2)	(3)	(4)	(5)	(6)
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TABLE - VIII : LIGHTNING

1.	19 Feb.	Bhatinda (Punjab)		One person killed.	
2.	28 Mar.	Quilon (Kerala)		2 women killed in Chathanur.	
3.	20 Apr.	Malappuram (Kerala)		3 women killed in Vallikunnu and Tiruangadi villages.	
4.	21 Apr.	Shimoga (Karnataka)		2 persons killed and one seriously injured in Gandhi and Ghatnahali villages.	
5.	12 May	Mahabubnagar (Andhra Pradesh)		One person and 2 bullocks killed in Goppambally village near Achampet.	
6.	13 May	Guntur (Andhra Pradesh)	(i) 2 persons injured. (ii) 280 goats and 4 buffaloes killed at Gundalapalli near Narasaraopet. Loss estimated around Rs. 1.2 lakh.		
7.	17 May	(a) Alleppey (Kerala) (b) Trivandrum (Kerala)		A woman killed at Mavelikara. A 9-year old girl at Karakulam killed and 7 other injured at Varkala.	
8..	18 May	Cannanore (Kerala)		One person killed.	
9.	10 Jun.	Ahmednagar (Maharashtra)		6 persons killed in Parner taluka.	
10.	13 Jun.	Buldhana (Maharashtra)		2 persons killed and 2 seriously injured in Dahid village.	
11.	16 Jul.	Nanded (Maharashtra)		2 persons killed.	
12.	20 Jul.	Durg (Madhya Pradesh)		A child killed at Sundongari village.	

(1)	(2)	(3)	(4)	(5)	(6)
13.	22 Aug.	Jabalpur (Madhya Pradesh)		One boy killed. killed	
14.	23 Sep.	Parbhani (Maharashtra)		13 persons/and 7 children injured due to lightning while working in the field.	
15.	27 Sep.	(a) Buldhana (Maharashtra)		4 persons killed in Rukhed Tukadi village.	
		(b) Nashik (Maharashtra)		3 persons killed.	
16.	8 Oct.	Aurangabad (Maharashtra)		3 students injured when lightning struck a school building at Khuldabad.	
17.	17 Oct.	Raigad (Maharashtra)		3 women killed at Kirwali village of Karjat taluka.	

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 \geq 75 kmph.

1.	7 Feb.	Karaikal (Pondicherry)	Severe (Tornado)	One person died in hut collapse.	A tornado swept Budhanur, 17 km. from Karaikal at 0910 hrs IST.
2.	19 Feb.	Ludhiana (Punjab)	Severe (Tornado)	About 25 persons injured.	(i) A tornado hit pilge village and subsided at Mangli village affect- ing an area of radius 2 km. (ii) 15 houses and 2 godowns damaged. Several roof tops of temporary constructions blown off. (iii) Many electric poles and trees uprooted.

(1)	(2)	(3)	(4)	(5)	(6)
3.	3 Apr.	Jorhat (Assam)	Moderate		8 houses collapsed rendering many families homeless.
4.	9 May	(a) Bangalore (Karnataka)	Severe	2 persons killed due to electrocution and 3 other injured when a tin sheet fell on the crowd watching a football match.	
		(b) Calcutta (West Bengal)	Severe	9 persons injured in two separate incidents of wall collapse.	(i) Normal life in city completely paralysed. (ii) Several trees/electric poles uprooted disrupting power supply. (iii) Vehicular traffic suspended.
5.	13 May	Bangalore (Karnataka)	Severe	One man died and 12 injured when a thatched structure collapsed at Koramangala.	
6.	26 May	Cuttack (Orissa)	Severe	One person killed and other injured at Athagarh in house collapse.	
7.	12 Sep.	Greater Bombay	Moderate	One person injured due to electrocution in central Bombay.	

(1)	(2)	(3)	(4)	(5)	(6)
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TABLE - X : HAILSTORMS

CRITERIA

Slight : Sparse, usually small in size and often mixed with rain.
 Moderate : Fall abundant enough to whiten ground.
 Heavy : Includes at least a proportion of large stones.

1.	10 Jan.	Khandwa (Madhya Pradesh)	Moderate		
2.	12 Jan.	Raisen (Madhya Pradesh)	Moderate	(i) One 5-year old girl died. (ii) 2 buffaloes killed in Migagar village.	50% of the crop in Kutana-wadi, Badnagar and Bijapur villages destroyed. (i) Hailstones weighing 50-200 gms. reported. (ii) 125 villages affected.
3.	15 Jan.	Jalaun, Kanpur and Lucknow (Uttar Pradesh)	Moderate to Heavy	2 persons died.	(i) Hailstones weighing 250 gms. reported at Kanpur and 50 gms at Jalaun and Lucknow. (ii) Crop worth Rs. 4 lakh destroyed.
4.	12 Feb.	Raisen (Madhya Pradesh)	Heavy		(i) 125 villages affected. (ii) Several houses damaged. (iii) Loss estimated around Rs. 5 crore.
5.	18-20 Feb.	Bhatinda, Faridkot, Ferozepur and Ludhiana (Punjab)	Moderate	Many cattle perished in Rama Mandi in Bhatinda district.	(i) 100 villages affected. (ii) Crops badly damaged.
6.	19 Feb.	Faizabad and Hamirpur (Uttar Pradesh)	Moderate	2 persons killed in Hamirpur district.	
7.	14 Mar.	Nellore (Andhra Pradesh)	Moderate	(i) One person killed. (ii) Several cattle perished.	Crops badly damaged. (i) Number of roof tops of thatched houses blown away at Sitaramapuram village in Udaigiri taluk. (ii) Considerable damage to crop reported.

(1)	(2)	(3)	(4)	(5)	(6)
8.	26 & 27 Mar.	Basti, Gorakhpur and Kheri (Uttar Pradesh)	Moderate	2 persons died in Basti district.	(i) Hailstones of size of medium potato reported at Lakhimpur-Kheri. (ii) Mango and other standing crops badly damaged. (iii) Large number of roof-tops and huts blown off away. (iv) Electric/telephone poles uprooted disrupting power and communication system.
9.	16-21 Apr.	Ferozepur (Punjab)	Moderate	Large number of sheep and goats perished.	(i) 19 villages in Fazilka tehsil affected. (ii) Crops and orchards extensively damaged.
10.	27 Apr.	Visakhapatnam (Andhra Pradesh)	Moderate		(i) Yellamanchili, Paravada, Chodavaram and Anakapalli villages badly affected (ii) Banana plantation and mango orchards suffered heavy loss. (iii) Electric instalations and telephone lines snapped. Loss to State Electricity Board estimated around Rs. 1 lakh.
11.	28 Apr.	Bongaigaon (Assam)	Heavy		(i) Birjhora tea estate completely damaged. (ii) Several thatched houses blown off. (iii) Extensive damage caused to vegetable crop.
12.	5 May	West Godavari (Andhra Pradesh)	Moderate		100 huts and 50 tiled houses destroyed in Chintalapudi taluka.
13.	12 May	Jammu (Jammu & Kashmir)	Moderate		Power and water supply in Jammu city and its surroundings disrupted affecting normal life.

(1)	(2)	(3)	(4)	(5)	(6)
14.	17 May	Trivandrum (Kerala)	Moderate		<ul style="list-style-type: none"> (i) About 1000 houses damaged in Niyya-tinkra taluka. (ii) Many trees/electric/telephone poles uprooted disrupting power supply. (iii) Broadcast from AIR Trivandrum remained disrupted for more than 4 hours.
15.	22 May	Bangalore (Karnataka)	Moderate		Damage worth Rs. 25 lakhs occurred to Aero-Engine division of Hindustan Aeronautics Ltd. and New Govt. Electronics Factory.
16.	26 Aug.	Baramulla and Badgam (Jammu & Kashmir)	Moderate		Standing crop badly damaged.
17.	28 Sep.	Jammu & Kashmir	Heavy		<ul style="list-style-type: none"> (i) 505 villages affected. (ii) Standing crop in 24,291 hectares of land extensively damaged.

S.No.	Date/Period	Area affected	Intensity (river)	Casualties	Remarks
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TABLE - XI : FLOODS & HEAVY RAINS

ANDHRA PRADESH

1.	13-17 Feb.	(a) Nallore	Heavy rains	5 persons died	Paddy crop in 15466 hectares and coconut in 8097 hectares completely damaged. Chilli crop in 1619 hectares partially damaged. Total loss estimated to be worth Rs. 15 crore.
		(b) Prakasam	Heavy rains		Paddy crop in 2530 hectares, Tobacco in 1200 hectares, Corriander in 2500 hectares and Red gram in 2100 hectares completely damaged. Loss estimated to be Rs. 1 crore.
		(c) Chittor	Heavy rains	200 sheep and 50 cattle perished.	Paddy crop in 1269 hectares and groundnut crop in 4771 hectares completely damaged while paddy crop in 8261 hectares, groundnut crop in 587 hectares and chilli in 1215 hectares of land partially damaged. Loss estimated to be worth Rs. 7 crore.
2.	10 Sep.	Visakhapatnam	Heavy rains	4 persons injured in a wall collapse in Pandurangapuram area of the city.	Several thatched houses damaged.

ASSAM

1.	13-17 May	Cachar and Karimganj	Severe (flash floods)	4 persons including 3 children died.	Highway link between Assam and Tripura disrupted.
2.	Jun. (2nd week)	Cachar, Dibrugarh, Jorhat, Lakhimpur and Darrang	Severe (Brahmaputra and its tributaries)		(i) Standing crops in large tract of low lying reverine areas damaged. (ii) Many villages in Upper Assam submerged under flood water. (iii) Some parts of Kaziranga National park in Jorhat district inundated by flood waters and animals forced to take shelter to safer places.

(1)	(2)	(3)	(4)	(5)	(6)
3.	Jul. (2nd week)	Darrang, Goalpara, Dhubri, Dibrugarh, Lakhimpur and Nowgong	Severe (Brahmaputra and its tributaries)	(i) 3 persons drowned in Marigaon sub-division while 4 others including 2 children washed away in Char village (Darrang district). (ii) A 10-year old child died in Dibrugarh district.	(i) One lakh people in 200 villages affected. The worst affected districts were Dhubri, Goalpara and Lakhimpur. (ii) In Dhubri district 140 villages badly affected. (iii) More than 50 houses washed away. (iv) Standing paddy and jute crop damaged. (v) Road communication completely disrupted.
4.	Jul. (4th week)	Barpeta, Dibrugarh, Lakhimpur and Dhubri	Severe (Brahmaputra, Tista and their tributaries)	28 persons died.	(i) 1832 villages with 6 million population affected. (ii) Entire 800 km. long valley from Dibrugarh to Dhubri submerged under flood water. (iii) In Lakhimpur district one lakh people affected and 20,000 families rendered homeless. (iv) Road communication in several parts of the State remained cut off.
5.	Aug. (4th week)	Dhubri	Severe (Brahmaputra and its tributaries)		(i) 20 villages covering 50 sq.km. area washed away. (ii) Standing jute crop badly affected (iii) Damage to property and crop estimated around Rs. 4 crore.
6.	Sep. (2nd to 4th week)	Barpeta, Bhubri, Darrang, Dibrugarh, Goalpara, Jorhat, Kamrup and Lakhimpur	Severe (Brahmaputra and its tributaries)	(i) 43 persons died and many reported missing. (ii) Hundreds of cattle perished.	(i) In Lakhimpur district 119 villages with population more than one lakh affected while in Barpeta district 1.5 lakh people affected. In Goalpara district 250 villages with population more than 2 lakh affected. In Kamrup district about 20,000 families in Nalbari and Rangiya sub-division affected. Total number of persons affected : About 2 million.

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

BIHAR

1. Jun. (2nd to 4th week) Bhagalpur, Severe Darbhanga, East (Chanan, Ganga, Champaran, West Gandak, Kosi and Champaran and Narayani) Munger

14 persons died.

- (ii) 3000 families rendered homeless and thousands marooned.
- (iii) Paddy crop in 600 sq.km.area completely damaged while Sali crop badly damaged.
- (iv) Entire north-eastern region cut off for 2 days (16 & 17 Sep.) from the rest of the country.
- (v) Flood water breached roads, railway tracks and embankments disrupting road/railway communication.
- (vi) Several houses washed away.

- (i) 3 million people in 1200 villages affected; 300 families rendered homeless.
- (ii) Worst affected district was Darbhanga, A population over 1.5 lakh from this district affected.
- (iii) Crop worth Rs. 15 crore damaged.
- (iv) 15,000 houses destroyed.
- (v) 3 km long embankment of Gandak breached, affecting 49,000 people in 30 villages of Madhuban and Thakarha block.
- (vi) 3 km stretch of Piprasi-Pipraghat embankment washed away by swollen Gandak along Bihar-Uttar Pradesh border.
- (vii) Road communication disrupted due to change in course of river Chanan in Bhagalpur district. Bhagalpur-Dumka road inundated.

(1)	(2)	(3)	(4)	(5)	(6)
2.	Jul. (2nd to 4th week) and Aug. (1st week)	Bhagalpur, East Champaran, West Champaran, Katihar, Madhubani, Munger, Samastipur, Siwan, Muzaffarpur, Saran, Patna, Darbhanga, Sitamarhi, Saharsa, Begusarai, Khagaria, & Bhojpur	Severe (9 major rivers viz. Bagmati, Chanan, Gandak, Burhi Gandak, Ganga, Kamala Balan and Mahananda)	22 persons died.	<ul style="list-style-type: none"> (i) Over 6000 villages affected. (ii) 9 million persons affected, 50,000 persons marooned and shifted to safer places. (iii) 45,000 houses collapsed. (iv) Standing crop in 1.46 million hectare area submerged under flood water. Loss estimated to be worth Rs. 90 crore. (v) Madhubani district cut off from the rest of the State as the flood water submerged more than ten periphery roads, suspending the vehicular traffic. (vi) 80 villages in West Champaran district affected due to breaches at various points in Gandak embankment. (vii) The Chanan river in Bhagalpur district changed its course breaching Babua embankment, inundating entire Jagdishpur block. (viii) In Madhubani district 5 lakh people affected while in Katihar 300 sq.km. area submerged under flood water affected 4 lakh people. (ix) Vehicular and railway services disrupted on N.E. Railway as Sitamarhi-Darbhanga section submerged under flood water. Muzaffarpur-Raxaul National Highway breached at two places.
3.	Aug. (3rd and 4th week)	Aurangabad, Bhojpur, East Champaran, West Champaran, Darbhanga, Gaya, Muzaffarpur, Palamau, Patna, Saran and Siwan	Severe (Gandak, Pun Pun and Son)	<ul style="list-style-type: none"> (i) 52 persons died. (ii) 35 cattle perished. 	<ul style="list-style-type: none"> (i) 86 lakh people in 7739 villages in 188 blocks, and 1902 panchayats, affected. (ii) Darbhanga district worst affected.

(1)	(2)	(3)	(4)	(5)	(6)
4.	20 Aug.	Gaya	Severe (Flash flood in Lilajan)		Flash flood washed away diversion bridge on chatra-Gaya road dis- rupting vehicular traffic.
5.	Sep. (1st week)	Saharsa, Saran, Sitamarhi and Vaishali	Severe (Bagmati, Ganga and Kosi)	4 persons drowned when a country boat capsized in Bagmati near Bharampur (Sitamarhi district)	(i) In Saran and Vaishali districts 3 lakh people affected. In Vaishali district flood water of Ganga submerged 130 villages in 5 blocks. (ii) In Saharsa district the turbulent Kosi river inundated more than 80 villages, 20 villages under Nauhatla block worst affected. (iii) Crop worth Rs. one crore damaged. (iv) 3 km. long stretch of Sonpur- Chapra main road submerged under flood water, disrupting vehicular traffic (v) Kosi river breached its eastern embankment submerging approach- able road and 1 km stretch of rail track.
6.	8 Sep.	(a) Gaya (b) Katihar	Severe (Daroaha) Severe (Mahananda)	45 persons drowned when a boat capsized in swollen Daroaha.	Flood water entered Katihar town due to a breach right embankment of river Mahananda.
7.	Sep. (3rd and 4th week)	Madhubani and Saharsa	Severe (Kamla Balan and Kosi)		(i) Kamla Balan breached its embank- ment near Luakaha (Madhubani district) inundating vast areas. 500 people rescued to safer places. (ii) 25,000 people marooned in Saharsa district. (iii) All educational institutions closed indefinitely. (iv) Road and railway communication completely disrupted.

(1)	(2)	(3)	(4)	(5)	(6)
<u>GUJARAT</u>					
1.	Jun. (3rd week)	Bhavnagar	Severe (flash flood in Manari)		Property worth Rs. 10 lakh at a ship yard near Bhavnagar, damaged.
2.	Jul. (1st week)	Saurashtra region	Severe (Oza)	6 persons died and 3 injured.	
3.	Jul. (2nd week)	Valsad, Dangs and Surat.	Severe (Ambika, Auranga and Purna)	17 persons swept away.	(i) All these three districts cut off from other parts of the state. (ii) 51 km. stretch of a road between Vaghai and Saputara submerged under flooded nullah near Baj village disrupting vehicular traffic to Maharashtra. Baj bridge suffered extensive damage. (iii) 45 km. stretch of a road between Ahwa and Saputara damaged due to landslide. Extensive damage to atleast 5 bridges reported, causing a loss of several lakhs of rupees. (iv) Estimated damage of Rs. One crore to public property including cul- verts, bridges and roads reported in Dangs district alone. (v) Standing crop washed away. Many houses damaged.
4.	Aug. (1st week)	Banaskantha, Junagadh, Mehsana	Severe (Kheri, Pushpavati and Rupen)	3 persons including 2 boys died and 3 injured in house collapse.	(i) Heavy loss of property from Mehsana district reported. (ii) 6 houses collapsed. (iii) A car swept away on Ahmedabad - Delhi National highway near Mehsana. (iv) Railway and road traffic disrupted.

(1)	(2)	(3)	(4)	(5)	(6)
5.	Aug. (2nd week)	Ahmedabad, Bharuch, Panchmahals and Vadodara	Severe (Narmada and its tributaries)		<ul style="list-style-type: none"> (i) Flood water entered low lying area of Bharuch and Ankaleshwar towns along south bank of the river. (ii) People from many villages along the Narmada embankment shifted to safer places. (iii) People living in slums along the bank of Sabarmati in Ahmedabad shifted to safer places.
6.	Aug. (3rd week)	Bharuch	Severe (Narmada)		<ul style="list-style-type: none"> (i) 21 villages affected. (ii) More than 7600 people and nearly 10,000 cattle rescued.
7.	Sep. (2nd week)	Saurashtra region	Severe (Flash flood in Kalwa)		<ul style="list-style-type: none"> (i) 180 villages threatened due to flash flood as 18 irrigation dams overflowed. (ii) All the low lying areas in Junagadh town submerged.
<u>JAMMU & KASHMIR</u>					
1.	17 Jul.	Jammu	Heavy rains		<ul style="list-style-type: none"> (i) 15 houses collapsed and many other damaged. (ii) All vehicular traffic disrupted.
2.	10 Aug.	Kargil	Cloud burst		Srinagar - Leh National highway breached between Kargil and Mulbekh.
3.	14 Aug.	Kargil	Cloud burst	14 people killed.	6 houses washed away in Sachey Karoor village.
4.	24 Aug.	Kargil	Heavy rains	2 persons and several other injured in Chokaten village, 70 km. from Kargil.	

(1)	(2)	(3)	(4)	(5)	(6)
5.	27 Aug.	Srinagar	Cloud burst		(i) Vehicular traffic on National Highway No.1 connecting Srinagar with the rest of the country, disrupted. (ii) Two km. stretch of highway near Barsoo village, 49 km. from Srinagar submerged under 3 metre of water.
6.	28 Aug.	Baramulla	Cloud burst	12 cattle perished at Noorpur.	
7.	1 Sep.	Poonch	Cloud burst	6 people (including 3 women) killed at Gagrian Sawian village.	(i) Number of houses damaged. (ii) Main water supply point to Srinagar city badly damaged disrupting water supply to Srinagar city.

KARNATAKA

1.	15 Jun.	Kodagu	Severe (flash flood in Cauvery)	One person washed away near Napeklu.	
2.	16 Jun	Dakshina Kannada	Heavy rains		(i) Several houses and roof tops collapsed. (ii) Many trees, electric wires blown off. (iii) Mangala Express between Bangalore and Mangalore cancelled due to landslide between Yedekumari and Shrivagilu.
3.	2 & 3 Jul.	(a) Chikmagalur	Heavy rains	13 plantation workers died in a massive landslide in Mudigere taluka.	
		(b) Shimoga	Heavy rains	Two workers killed in a landslide.	

(1)	(2)	(3)	(4)	(5)	(6)
4.	Jul. (2nd week)	Chikmagalur, Kodagu and Shimoga	Severe (Cauvery, Tunga and Kabini)	A 5-year old boy washed away at Madikere.	(i) Vast stretch of Paddy field flooded. (ii) Vehicular traffic between Chikmagalur and Shimoga disrupted.
5.	1 Oct.	Bangalore	Heavy rains	One person died in house collapse.	Several huts collapsed.
		<u>KERALA</u>			
1.	23 Apr.	Malappuram	Severe (Flash flood in Perinathamanna)	3 women drowned.	
2.	15 Jun.	(a) Kottayam	Heavy rains	25 people injured when a bus overturned in Murattupazha.	(i) Low lying areas submerged. (ii) Several roads damaged.
		(b) Wynad	Heavy rains	A family having 8 members died when their house submerged under water at Puthupaddy, 40 km east of Kozhikode.	Several roads washed away.
3.	16 Jun.	(a) Kozhikode	Heavy rains	2 fishermen drowned in sea.	Widespread damage occurred to agricultural property.
		(b) Palghat	Heavy rains	2 boys killed in a house collapse at Karimba near Mannarghat.	Standing crops extensively damaged.
4.	17 Jun.	(a) Alleppey	Heavy rains	2 fishermen drowned at Punnapara.	Extensive damage to agriculture reported.
		(b) Cannanore	Heavy rains	2 persons drowned and one woman electrocuted in Tellichery.	
		(c) Malappuram	Heavy rains	One person died and 4 injured in Perinthalamanna.	

(1)	(2)	(3)	(4)	(5)	(6)
5.	17-28 Jun.	Ernakulam	Heavy rains	17 persons died.	
6.	18 Jun.	Alleppey	Heavy rains		(i) Paddy and other crops in about 1000 hectares land badly damaged. (ii) Hundreds of trees uprooted.
7.	1-3 Jul.	Wynad	Heavy rains	16 people died.	(i) 50 hectares of land buried under the debris as huge mass of rock and earth crushing down from the hill on 2nd. (ii) 80 houses destroyed in Kelpatta and Vengapally. (iii) Plantation crop in 41 hectares submerged in Mundakayil estate.
8.	5 Oct.	Alleppey	Heavy rains	A 60-year old man and 2-year old boy drowned when a country boat capsized in Vembanad lake off Thuravur.	
9.	6-8 Oct.	Kozhikode	Heavy rains	17 people killed in landslide.	(i) Many huts collapsed. (ii) Widespread damage to roads and crops reported.
<u>MADHYA PRADESH</u>					
1.	23 & 24 Jul.	Indore	Heavy rains	6 persons including 2 children died in separate incidents of house collapse.	
2.	3 Aug.	(a) Indore (b) Ujjain	Heavy rains Heavy rains		Many houses collapsed. (i) 3 kutcha houses damaged. (ii) One tea stall swept away. (iii) Many trees uprooted.
3.	5 Aug.,	(a) Balaghat	Heavy rains	3 women drowned in river Vainganga 12 km, from Balaghat.	

(1)	(2)	(3)	(4)	(5)	(6)
		(b) Ratlam	Heavy rains	One person drowned in Namhi nullah.	
		(c) Ujjain	Heavy rains	One person drowned in Bhurinkhal nullah.	
4.	11 Aug.	(a) Bhopal	Heavy rains		(i) State capital cut off from all the important towns. (ii) The road connecting to Indore, Gwalior, Sagar, Jabalpur submerged under water disrupting vehicular traffic.
		(b) Rewa	Severe(Son)	12 persons drowned.	
		(c) Vidisha	Heavy rains		(i) Vidisha town cut off from Sironj, Baroda, Sagar and Gyaraspur. (ii) Betwa bridge near Vidisha submerged under 0.6 metre of water.
5.	12 Aug.	(a) Dewas	Heavy rains	One person died and another injured in a house collapse in Jabran colony.	
		(b) Ratlam	Heavy rains		12 houses collapsed.
6.	17 Aug.	Balaghat	Severe(Flash flood in Nahar nullah)	103 people died and 108 injured when 5 bogies of Jabalpur-Gondia passenger train fell into swollen Nahar nullah.	
7.	18 Aug.	(a) Bhopal	Heavy rains		6 houses collapsed.
		(b) Khandwa	Heavy rains		(i) Khandwa town cut off from rest of the state. (ii) Vehicular traffic completely disrupted.
		(c) Raipur	Heavy rains	4 persons died and 12 injured in house collapse.	

(1)	(2)	(3)	(4)	(5)	(6)
8.	19 Aug.	Jabalpur	Heavy rains	(i) 5 persons died when a bus fell into a nullah near Jabalpur city. (ii) One person died when water entered into the house.	
9.	20 Aug.	Hoshangabad	Heavy rains	5 persons died in a house collapse.	
10.	21 Aug.	Ratlam	Severe (Flash flood in Gandhisagar dam and Chambal river)	6 persons died in a landslide at Rampuria.	Kharif crop worth Rs. 8 to 10 crore damaged.
11.	22 Aug.	(a) Raigarh (b) Raipur	Heavy rains Heavy rains	2 women and a child killed in a house collapse.	A bridge at Pelykhedi damaged.
12.	27 Aug.	Ujjain <u>MAHARASHTRA</u>	Heavy rains		One bridge badly damaged.
1.	9 Jun.	Pune	Heavy rains	12 slum dwellers drowned on Shankarseth road.	
2.	15 Jun.	Greater Bombay	Heavy rains		(i) Low lying areas flooded. (ii) Vehicular traffic disrupted. (iii) Airflights delayed or diverted to Delhi.
3.	30 Jun. to 2 Jul.	(a) Amravati	Heavy rains	A 24-year old woman and 11-year old girl washed away while crossing nullah at Sukali village, 8 km. from Amravati.	Low lying areas in the city remained submerged under water for two days.

(1)	(2)	(3)	(4)	(5)	(6)
	(b) Greater Bombay	Heavy rains	One person electrucated at Sion.	(i) Century's second highest rainfall 54.0 cm in a day recorded by Colaba observatory on 2nd July. (ii) Normal life completely paralysed. (iii) All low lying areas on both sides of railway lines and a large number of roads submerged under water disrupting railway and vehicular traffic. (iv) Telecommunication system disrupted. (v) All principal markets closed.	
	(c) Kolhapur	Moderate (Panchaganga)	3 persons swept away in Shirol and Ajara talukas.	Vehicular traffic on Ichalkaranji - Nipani, Kolhapur - Sadoli Khalsa and Gadhinglaj - Nesari, routes, suspended.	
	(d) Konkan region	Severe (Jagbuddi, Saraswati and Vashisthi)	5 persons died (3 at Chiplun in Raigad district and 1 each in Sindhudurg and Ratnagiri districts.	(i) Area under Sangameshwar, Chiplun and Rajapur Police Stations inundated. Sangameshwar market submerged under water. (ii) Kubadwadi village encircled by water. (iii) Heavy damage to crops reported. (iv) Vehicular traffic on Gargoti-Ratnagiri and Gargoti-Chandgad suspended as the connecting roads badly damaged. (v) Bombay-Goa National Highway blocked for 3 days due to landslide near Dhamani. (vi) Vehicular traffic on Poladpurmasla road suspended due to breaches at three places. (vii) State Transport bus service partially or totally suspended.	
	(e) Nasik	Heavy rains	2 persons died in a wall collapse at Mahasrul village.		
4.	1-4 Jul. Pune	Heavy rains	One person died in the outskirts of Pune city while 15 other washed away in the different parts of the district.	All the low lying areas in Pune city inundated.	

(1)	(2)	(3)	(4)	(5)	(6)
5.	3 & 4 Jul.	Greater Bombay	Heavy rains	6 slum-dwellers died and many other injured when an overhead H.T. cable fell on their huts at Antop hill in north Bombay on 3rd.	<ul style="list-style-type: none"> (i) All low lying areas inundated. (ii) Long distance train from Bombay V. ran indefinitely late and some trains cancelled. Thousands of passengers stranded. (iii) 9000 telephones reported dead due to 36 cable faults.
6.	14 Jul.	Nagpur	Heavy rains	3 persons died.	
7.	17 & 18 Jul.	Greater Bombay	Heavy rains	11 fishermen reported missing, feared to be drowned.	<ul style="list-style-type: none"> (i) Two fishing trawlers 'Almadani' and 'Wageshwari' capsized across Bombay harbour. (ii) Several low lying areas flooded. (iii) Vehicular traffic disrupted.
8.	17-19 Jul.	Konkan region	Severe (Vashisthi)	<ul style="list-style-type: none"> (i) 12 persons swept away in flood water. (ii) 300 people and a large number of cattle reported missing. 	<ul style="list-style-type: none"> (i) Two fishing vessels capsized off Raigad coast. (ii) Sassoon dock in Colaba remained chocked with about 500 trawlers. (iii) Bombay - Goa National Highway closed for traffic due to landslide near Nadgao, 6 km. from Mahad.
9.	Jul. (3rd week)	Thane	Severe (Tansa and Vaitarna)	12 persons and several cattle reported washed away.	<ul style="list-style-type: none"> (i) 150 villages in Vasai, Palghar, Daham, Bhivandi/Mokhada talukas with a /and population of more than 5 million affected. (ii) Maximum damage caused in Wada and Vasai talukas, where 1500 hectares of cultivated land damaged. (iii) Several Adivasi families rendered homeless in Vasai taluka. (iv) Property worth lakhs of rupees damaged. (v) Several villages in Vasai and Bhivandi talukas submerged under water for 48 hours.

(1)	(2)	(3)	(4)	(5)	(6)
					(vi) Many people trapped on tree tops at Ghateghi and Shairam villages.
					(vii) 70 houses submerged and 7 houses collapsed.
					(viii) 8 fully loaded trucks washed away on Bombay-Ahmedabad road near Tansa bridge, 75 km. from Bombay.
					(ix) 50 boats anchored along the river-side swept away and 20 more vessels damaged.
10.	21 Jul.	Kolhapur	Heavy rains		(i) 10 shops and 30 houses collapsed in Ajra taluka.
					(ii) Normal life in interior Kolhapur district completely paralysed.
					(iii) Vehicular traffic disrupted.
11.	2 Aug.	Amravati	Heavy rains		(i) 21 houses and 7 shops washed away.
					(ii) Normal life in Amravati city completely paralysed.
12.	3 Aug.	Nagpur	Heavy rains		Costly equipments including giant cranes of the 'Central National Project Construction Corporation' at 'Pench Hydroelectric Project, about 80 km. from Nagpur washed away. Loss estimated to be worth several lakh rupees.
13.	6 Aug.	Nashik	Moderate (Godavari)		(i) Many low lying areas in Nashik city submerged under water. Residents of these areas evacuated to safer places.
					(ii) Culvert connecting Nashik and Panchwati submerged under water.
14.	9-12 Sep.	Jalna	Heavy rains	One boy died and another injured at Golatgaon village.	

(1)	(2)	(3)	(4)	(5)	(6)
15.	11 Sep.	Pune	Heavy rains	2 cyclistswashed away in swollen nullah near Rasta Peth.	
16.	12 Sep.	Greater Bombay	Heavy rains	One person injured.	(i) Several low lying areas flooded. (ii) 50 drums containing chemicals caught fire at Haji Bunder. (iii) Several cases of short-circuits reported.
17.	8 Oct.	Pune	Heavy rains	A 7-year old girl died and her mother and brother injured in a house collapse in Pune city.	

ORISSA

1.	12 & 13 Jun.	Koraput	Heavy rains		800 people evacuated to safer pl
2.	13 Jun.	Ganjam	Severe (Vamshadhara)		(i) 5000 people affected and 1000 pe marooned. 1000 houses collapsed 3school buildings damaged. (ii) 7 villages in Kasinagar block su merged. (iii) Many country boats washed away. (iv) Road traffic through Ganupur dis rupted as a wooden bridge on riv Vamshadhara washed away.
3.	Aug. (2nd week) to Sep. (1st week)	Balasore, Cutt- ack, Dhenkanal, Ganjam, Keonjhar Koraput, Puri & Baudh Khandmals	Severe (Baitarni, Brahmani, Devi, Indravati, Kolab, Subar- narekha)	(i) 27 persons died (highest toll recorded in Cuttack district) (ii) 459 cattle perished.	(i) 35,11,177 people in 6137 village affected. (ii) Paddy, vegetables and oilseed cr badly damaged. 352448 hectare c tivated land damaged. (iii) 7908 hectares of land sandcast. (iv) 37 houses swept away while 3709 pletely and 15648 partially coll 9700 school and collage building affected in flood. (v) 4740 km. stretch of road damaged. (vi) 4756 telecommunication lines aff

(1)	(2)	(3)	(4)	(5)	(6)
<u>PUNJAB</u>					
1.	1 Sep.	Jullundur and Amritsar	Heavy rains		(i) Standing paddy crop in these districts badly damaged. (ii) Rail and road traffic disrupted. (iii) 9 metre stretch of Kapurthala-Sultanpur Lodhi road near Fathidh- inga village submerged.
<u>RAJASTHAN</u>					
1.	20 Jul.	Ajmer	Heavy rains	14 teenaged children and a female teacher of a primary school, killed in a house collapse; 7 other children seriously injured.	
<u>TAMIL NADU</u>					
1.	16 & 17 Feb.	Madras city and Suburban area.	Heavy rains	8 persons died in hour collapse.	Extensive damage caused to buildings.
2.	4-6 Mar.	Tirunelveli	Heavy rains	12 persons died.	
3.	4-7 Mar.	Madurai and North Arcot	Severe(Flash flood in Vaigai and its tributaries)		(i) Several butts on either side of Vaigai river in Madurai city washed away. (ii) Standing Paddy and groundnut crop in 32000 hectare area damaged.
4.	6 Mar.	Tiruchirapalli	Heavy rains	3 children in age group 8-12 years died and 40 other belonging to the same family injured in a house collapse in Laxminakantapuram near Turaiyur.	
5.	30 Apr.	Madurai	Heavy rains	4 persons died and 49 injured when a cinema hall at Vandiyur near Madurai, collapsed.	

(1)	(2)	(3)	(4)	(5)	(6)
6.	3 & 4 Oct.	Coimbatore	Severe (Flash flood in Sanganur Pallam)	(i) 7 persons including 4 women and one child died in a flash flood. (ii) 2 persons died in wall collapse in Coimbatore city.	(i) 4000 people rendered homeless. (ii) About 1000 huts located in low lying areas and on the bank of river washed away. Many buildings collapsed. (iii) Flood water entered huts and houses in Sanganur, Rathnapuri, Sivananda colony and Podanur.
<u>TRIPURA</u>					
1.	13-17 May	North Tripura	Severe (Flash flood in Howrah, Kotakhali and Manu)	26 persons died.	(i) 2.05 lakh people rendered homeless. 39,000 people took shelter in 47 relief camps. (ii) Standing crop badly damaged. Loss estimated to be worth Rs. 14 crore. (iii) Assam-Agartala road blocked for vehicular traffic at several points due to landslide. (iv) IA flights delayed.
2.	16-18 Jun.	North Tripura and West Tripura	Severe (Deo and Manu)	12 people buried and 20 other reported missing in a landslide in Sonumura sub-division, 80 km. from Agartala.	(i) Heavy landslide on Assam-Agartala road in Atharamuga ranges rendered highway totally ineffective for vehicular traffic. (ii) An important bridge at Paratia in south district washed away. (iii) Several mud houses collapsed. (iv) 80,000 families affected. (v) Large area of Kamalpur sub-division submerged under flood water.
<u>UTTAR PRADESH</u>					
1.	19-25 Jun.	Basti, Deoria and Gorakhpur	Severe (Flash flood in Kiwano)	3 girls drowned in a flooded nullah in Deoria district. 6 killed in Basti and Gorakhpur districts.	(i) 300 villages and 1 lakh people in Gorakhpur district marooned. (ii) Basti town cut off from the rest of the state due to breaches in the bridge on river Kiwano.

(1)	(2)	(3)	(4)	(5)	(6)
2.	29 Jun.	Nainital	Heavy rains	6 persons and large number of cattleheads perished in a landslide.	
3.	2 Jul.	Almora	Heavy rains	9 persons killed in a landslide in Jagthana village.	3 houses damaged.
4.	11 Jul.	Deoria	Severe (Burhi Gandak)		About 84 villages marooned.
5.	30 Jul.	Nainital	Heavy rains	8 persons killed in Puran village on Nainital road.	
6.	Jul. (4th week)	Azamgarh, Bahraich, Ballia, Bara Banki, Basti, Bijnor, Budaun, Deoria, Faizabad, Fatehpur, Gonda, Gorakhpur, Hamirpur, Kheri, Pithoragarh, Rampur	Severe (Ganga, Ghagra, Jamuna, Rapti and Sarju)	91 persons died.	<ul style="list-style-type: none"> (i) Srinagar-Turtipar bund in Ballia district breached endangering about 150 villages. (ii) Rapti river breached 16 metre of its embankment in Mehdawal area and marooned 40 villages. It also washed away a road bridge near Kusraulkhurd village disrupting road traffic. (iii) River Sarju affected 300 villages of 3 lakh population in Ballia district. (iv) Thermal power station at Faizabad faced immediate threat as Ghagra river changed its course. (v) In Deoria district 86 villages completely inundated and 21,000 hectares of land submerged. (vi) All the schools and colleges in Padruna and Hata tehsils in Deoria district closed due to grave flood situation.
7.	Aug. (1st, 2nd and 3rd week)	Azamgarh, Ballia, Deoria, Gorakhpur and Kheri	Severe (Ganga, Jamuna and their tributaries).	9 persons died.	<ul style="list-style-type: none"> (i) Army called in Gorakhpur district for flood relief following a breach in Sohagaura Nalauni embankment. (ii) Suheli and Mohana river in Kheri district cut off Dudwa National Park.

(1)	(2)	(3)	(4)	(5)	(6)
8.	31 Aug.	Varanasi	Heavy rains	13 people died in house collapse incidents in Modanpur and Adampura localities.	
9.	5-11 Sep.	Bahraich, Mirzapur and Varanasi	Severe (Ganga and its tributaries)	33 persons died.	<ul style="list-style-type: none"> (i) Vast stretch of low lying areas submerged under flood water. (ii) Road communication snapped at many places. (iii) Sudden discharge of water from Abraura embankment caused flash flood in Mirzapur district. (iv) 500 houses damaged in Mirzapur district.
10.	8 Sep.	Basti	Heavy rains		<ul style="list-style-type: none"> (i) All connecting roads submerged under water. (ii) A local Women Hospital closed and the patients asked to leave due to waterlogging.
WEST BENGAL					
1.	3-6 Jun.	Calcutta, Howrah and 24 Parganas	Heavy rains	<ul style="list-style-type: none"> (i) One person killed and 10 injured on 5th. (ii) 18 more died on 6th due to house collapse and electrocution. 	<ul style="list-style-type: none"> (i) 9000 people marooned in north Calcutta. (ii) 2 lakh people in Calcutta, Howrah and 24 Parganas districts affected. 10,000 people rescued to safer places. (iii) Train and air service completely disrupted. (iv) 30,000 telephone sets went out of gear. (v) Extensive damage was caused by the flooding of Metro Railways tunnel due to heavy rains during 1st week of June 1984.
2.	Jun. (2nd to 4th week)	Bankura, Birbhum, Burdwan, Cooch, Behar, Darjeeling, Jalpaiguri, Howrah, Hooghly, Malda, Midnapur, Nadia, West Dinajpur and 24 Parganas.	Severe (Ajoy, Bagmati, Damodar, Darakeshwar, Mayurakshi, Meghana, Mundeshwari, Silavati and Tista)	<ul style="list-style-type: none"> (i) 33 people died in Cooch Behar, West Dinajpur and Jalpaiguri districts. (ii) 19 people died and 9 reported missing in Bankura, Birbhum, Burdwan, Hooghly and Howrah. 	<ul style="list-style-type: none"> (i) One lakh people marooned and 100 villages submerged in Birbhum district. (ii) In Malda district 3.35 lakh people in an area of 270 sq.km. affected. Aman and Baro crops in 10121 hectares of land damaged. Loss to crop and property estimated to be worth Rs. 10 crore. 12,000 people rendered homeless.

(1)	(2)	(3)	(4)	(5)	(6)												
					(iii) 7 lakh people in Arambagh sub-division of Hooghly district affected and 2000 houses collapsed. 15,000 hectares of cultivated land inundated. Crop worth Rs. 1.25 crore damaged.												
					(iv) In Midnapur district, one million people affected and 7000 sq.km. area submerged. 21,000 houses destroyed while crops on 75,000 hectares of land damaged. Loss estimated to be Rs. 14 crore.												
					(v) Agriculture products worth Rs. 70 crore damaged. Aman and Aus seedbeds, Jute and Betel vines over an area about 2 lakh hectare destroyed. Crop-wise break-up as follows :												
					<table><tr><th>Type of crop</th><th>Area in thousand hectares</th></tr><tr><td>(i) Aman</td><td>72</td></tr><tr><td>(ii) Aus</td><td>41</td></tr><tr><td>(iii) Jute</td><td>32</td></tr><tr><td>(iv) Betel vines</td><td>2</td></tr><tr><td>(v) Vegetables</td><td>4</td></tr></table>	Type of crop	Area in thousand hectares	(i) Aman	72	(ii) Aus	41	(iii) Jute	32	(iv) Betel vines	2	(v) Vegetables	4
Type of crop	Area in thousand hectares																
(i) Aman	72																
(ii) Aus	41																
(iii) Jute	32																
(iv) Betel vines	2																
(v) Vegetables	4																
					(vi) Many places within Durgapur Steel Plant including coke oven, foundry and power plant submerged under water.												
					(vii) Ghatal town in Midnapur district cut off from the district as Silavati river inundated 5 causeways on the Ghatal-Chandrakona road.												
					(viii) Dantan town in Midnapur district isolated as a culvert on a road near Nekurshini, 60 km. from Midnapur town, breached.												
					(ix) Entire Juliadanga village in Burdwan district engulfed by swollen Bagmati river.												
					(x) Rainfall recorded between 23 and 25 June in Birbhum district was reported highest in the past 100 years.												
					(xi) Army and Airforce helicopters employed for rescue operations.												
					(xii) A railway bridge, 13 km. from Siliguri on Tista river, threatened by flood.												
					(xiii) Rail traffic connecting north Bengal with other adjacent States disrupted.												

(1)	(2)	(3)	(4)	(5)	(6)
3.	8 Jul.	Calcutta	Heavy rains		(i) Large number of low lying areas submerged under water. (ii) City bus and tram service disrupted.
4.	9 Jul.	Darjeeling	Heavy rains		(i) Hill cart road linking Siliguri and Darjeeling blocked due to landslide disrupting road communication between Darjeeling and Siliguri. (ii) Vehicular traffic between Siliguri and Gangtok disrupted due to landslide at Lekhubhir in Kalimpong area.
5.	Jul. (2nd and 3rd week)	West Dinajpur, Malda and Midnapur	Severe (Aitrye, Ganga, Mahananda, Punarnava and Tamon)		(i) 1.5 lakh people affected, 15,000 marooned people rescued. (ii) 300 sq.km. area covering 8 blocks of Malda district completely submerged rendering more than 2 lakh people homeless. (iii) Railway bridge near Kumedpur damaged disrupting railway service beyond Malda.
6.	Jul. (4th week)	(a) Darjeeling	Heavy rains		Road communication between Kalimpong and Gangtok remained cut off due to landslide at many places.
		(b) North Bengal	Severe (Tista)		Tista river washed away 3 spurs near Sevak railway bridge.
7.	Aug. & Sep (1st week)	Bankura, Birbhum, Burdwan, Hooghly, Howrah, Malda, Midnapur, Murshidabad and 24 Parganas	Severe (Bhagirathi, Kangsavati and Ganga)	(i) 4 persons died in Midnapur district. (ii) 15 other died in Malda district when a ferry boat capsized in swollen Bhagirathi at Arjunpur near Farakka.	(i) 6 lakh people marooned and about 10 lakh people rendered homeless in rendered Midnapur district. (ii) More than 3 lakh people affected in Hooghly district. (iii) Midnapur-Ghatal and Midnapur-Keshpur roads submerged under water disrupting vehicular traffic. (iv) Kangsavati river breached its embankment at 11 places. (v) One million people rendered homeless.

(1)	(2)	(3)	(4)	(5)	(6)
8.	Sep. (2nd week)	Cooch Behar and Jalpaiguri	Severe (Diana and Radhika)	(i) One child drowned. (ii) 50,000 cattle reported either perished or missing.	(i) Paddy crop worth Rs. 2.3 crore, vegetables worth Rs. 13.72 crore and Jute worth Rs. 45 lakh damaged. (ii) 2000 families rendered homeless while 9000 people evacuated to safer places. (iii) Train service between Haldibari in Cooch Behar and New Jalpaiguri and Siliguri disrupted. (iv) 15 metre stretch of road in Kolabari washed away by Diana river.

DELHI

1.	23 Aug.	Entire Union Territory	Heavy rains	(i) One person electrocuted and another drowned in a swollen nullah. (ii) 15 other persons injured under a wall collapse.	(i) Many low lying areas flooded. Life in Delhi city completely paralysed. (ii) H.T. wires snapped at many places and several electric poles uprooted disrupting power supply and telephone services. (iii) 100 vehicles stranded.
2.	1 Sep.	Entire Union Territory	Heavy rains	(i) Two persons died under a wall collapse near Bengali Market. (ii) A 60-year old man died when he fell into an open sewer at Baba Kharak Singh Marg. (iii) 3 labourers seriously injured when factory wall fell on Shankar road.	(i) Residents of hutment colonies were affected. (ii) Many vehicles marooned. (iii) 10,000 telephones snapped and 25 fires due to short-circuiting reported. (iv) Power supply to many areas disrupted.

GOA DAMAN AND DIU

1.	1 & 2 Jul.	North Goa	Heavy rains		(i) Low lying areas in Bicholim and Saquelim flooded. (ii) 200 commercial establishments in Saquelim and Bicholim bazar affected. (iii) Several huts collapsed. (iv) Several trees/electric poles uprooted.
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(1)	(2)	(3)	(4)	(5)	(6)
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2. 1 & 2 Aug. Panaji Heavy rains

Railway and vehicular traffic disrupted.

(i) 3000 families rendered homeless while 2000 people evacuated to safer places.
(ii) Train service between Balibari in Cochin and New Jalpaiguri and Siliguri disrupted.
(iii) 15 metre stretch of road in Kolabari washed away by Diana river.

(i) Many low lying areas flooded. Light duty completely paralysed.
(ii) 1500 wires snapped at many places and several electric poles uprooted disrupting power supply and telephone services.
(iii) 100 vehicles stranded.

(i) Residents of human colonies with affected heavy vehicles stranded.
(ii) 10,000 telephones snapped and 25 lines due to short-circuit reported.
(iii) Power supply to many areas disrupted.

(i) One person electrocuted and another drowned in a swollen nullah.
(ii) 15 other persons injured under a wall collapse.

(i) Two persons died under a wall collapse near Bhangali Market.
(ii) A 60-year old man died when he fell into an open sewer at Baba Khark Singh Mary.

(iii) 3 labourers seriously injured when factory wall fell on Shankar road.

(i) Low lying areas in Picholim and Sanguem flooded.
(ii) 200 commercial establishments in Sanguem and Picholim badly affected.
(iii) Several buses collapsed.
(iv) Several trees/electric poles uprooted.

(i) Heavy rains.

GDA PANAJI AND
DIP
North Goa

S.No.	Date/Period	Area of Formation/Dissipation	Intensity	Casualties	Remarks
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TABLE - XII : CYCLONIC STORMS

BAY CYCLONES

1.	12-15 Oct.	<p><u>Formation</u> : North-West Bay</p> <p><u>Landfall</u> : Just north of Chandbali.</p> <p><u>Dissipation</u> : 100 km North-West of Chandbali.</p>	<p>Severe (Maximum wind-speed 120 kmph.)</p>	<p>10 people injured in Midnapur district (West Bengal)</p>	<p>In Orissa,</p> <p>(i) Rajkanika, Rajnagar and Aul blocks of Cuttack district, affected.</p> <p>(ii) 3300 hectares of Paddy and Biri crop completely damaged in Rajkanika block.</p> <p>(iii) About 1215 hectares of Biri crop in Aul block damaged.</p> <p>(iv) In Rajnagar block, large number of roof tops of thatched houses blown away and telephone lines disrupted.</p> <p>In West Bengal,</p> <p>(i) Bhagwanpur, Egra, Kanthi, Patashpur and Ramnagar taluka in Midnapur district affected.</p> <p>(ii) 500 huts and many trees uprooted.</p> <p>(iii) Vehicular traffic on Digha-Kharagpur road disrupted.</p>
2.	9-14 Nov.	<p><u>Formation</u> : South-West Bay</p> <p><u>Landfall</u> : South Andhra Coast, north of Sriharikota (Nellore district).</p> <p><u>Dissipation</u> : Over north Tamil Nadu and adjoining Andhra Pradesh.</p>	<p>Severe (With core of Hurricane winds).</p>	<p>In Andhra Pradesh,</p> <p>(i) 604 people killed, of which 527 from Nellore district alone.</p> <p>(ii) 90,650 livestock including 26,346 cattle perished.</p>	<p>In Andhra Pradesh,</p> <p>(i) Chittoor, Cuddapah and Nellore districts affected.</p> <p>(ii) 18.31 lakh population in 1264 villages affected.</p> <p>(iii) 1,50,523 houses completely damaged and 1,71,894 houses partially damaged.</p>

(1)	(2)	(3)	(4)	(5)	(6)
					<p>(iv) Crops in 2.07 lakh hectares affected. Loss of crop estimated around Rs. 232.32 crore.</p> <p>(v) 356 PWD irrigation tanks and 258 minor irrigation sources damaged while 168 PWD roads damaged.</p> <p>(vi) 638 Panchayat Raj drinking water sources and 800 Panchayat Raj roads damaged.</p> <p>(vii) Two railway bridges between Sullurpet and Tada washed away disrupting railway service between Nellore and Madras.</p> <p>(viii) Sriharikota island cut off from the main land for many days.</p>
			In Tamil Nadu,		In Tamil Nadu,
			54 persons (3 in Chingleput district and 19 in Madras) died.	<p>(i) Chingleput and Madras districts affected.</p> <p>(ii) 84,000 people rendered homeless in Madras city alone.</p> <p>(iii) 3669 huts completely damaged and 1,23,244 partially damaged. Loss estimated around Rs. 3 crore.</p> <p>(iv) Several thousands of trees uprooted disrupting vehicular traffic, power and telephone services.</p> <p>(v) Air service cancelled and train services disrupted due to heavy damage to tract on the Madras-Calcutta and Madras-Renigunta (trunk routes).</p> <p>(vi) The ship 'Vishwa Anurag' drifted and grounded while the ship "Madhujaya" carrying fatty acids to Madras from Singapore ran aground near Kovalam.</p>	
3.	29 Nov. to 2 Dec.	<p><u>Formation</u> : South-West Bay.</p> <p><u>Landfall</u> : North of Karaikal</p> <p><u>Dissipation</u> : At 11.5°N 77°E</p>	Severe		In Tamil Nadu,
				<p>(i) Thanjavur and South Arcot districts affected.</p> <p>(ii) 15,000 people in Thanjavur and 20,000 in South Arcot districts, affected.</p> <p>(iii) Standing crop in 20,242 hectares in Mayiladuthurai and Nagapattinam taluka of Thanjavur district submerged due to heavy rains.</p>	

(1)

(2)

(3)

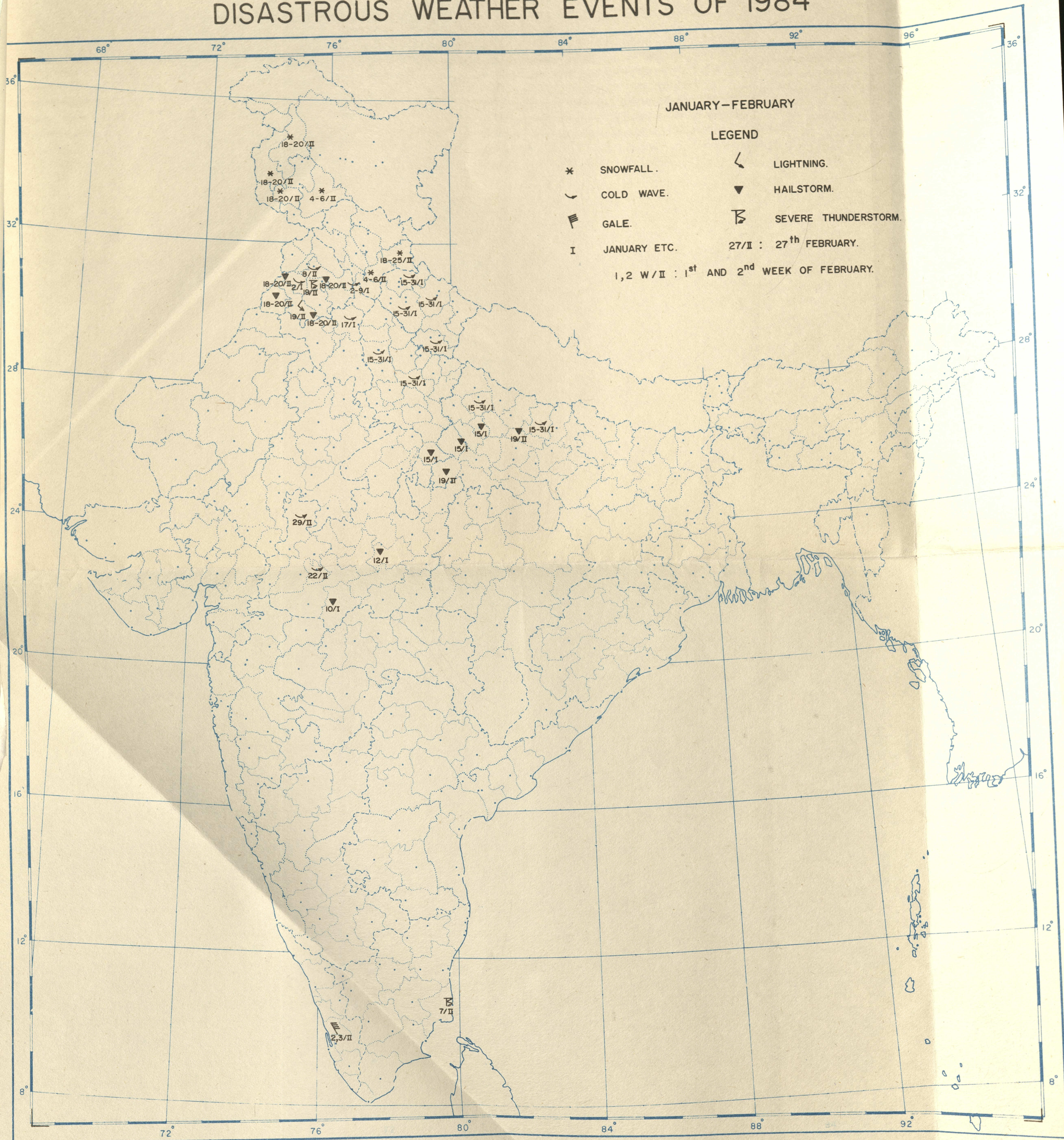
(4)

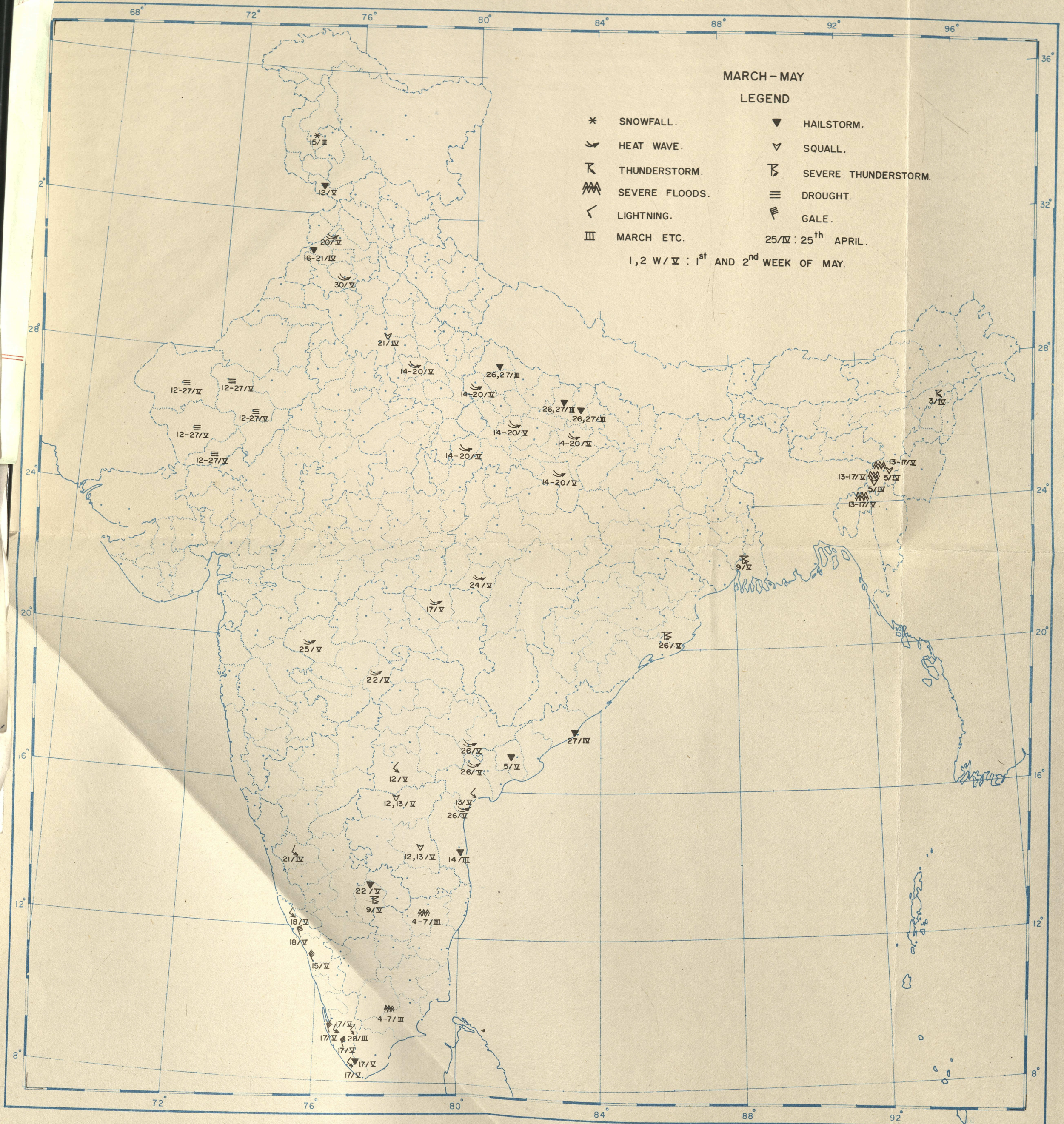
(5)

(6)

(iv) Erosion by sea-water near Thirumullai-
vasal (Thanjavur district) and
Marakkanam and Nalladu (South Arcot
district) reported.

(v) Two villages marooned.





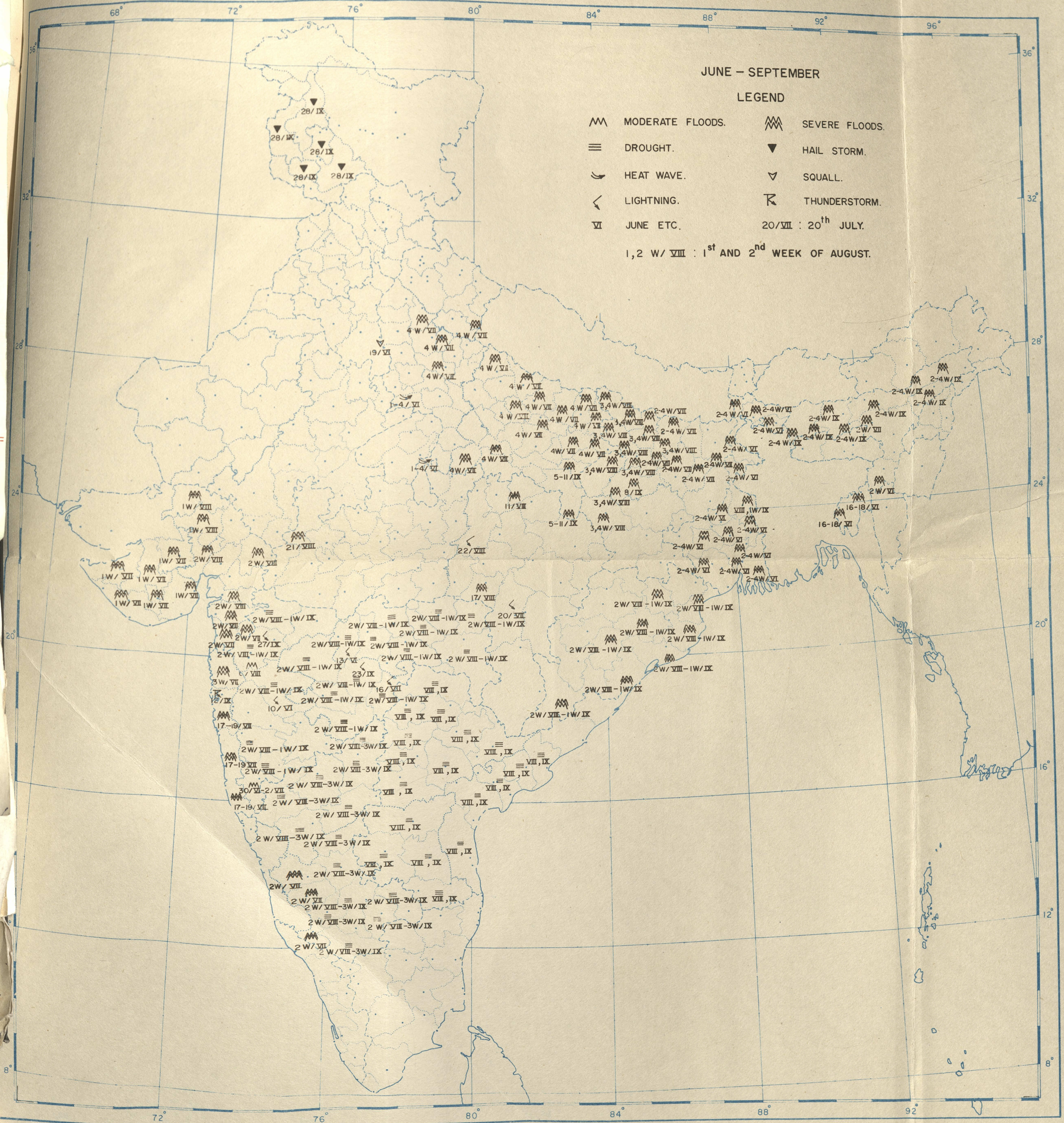
DISASTROUS WEATHER

DISASTROUS WEATHER EVENTS OF 1984

JUNE - SEPTEMBER

LEGEND

- | | | | |
|--------------|---|---------------------------------|----------------|
| ≡ | MODERATE FLOODS. | ≡ | SEVERE FLOODS. |
| ≡ | DROUGHT. | ▼ | HAIL STORM. |
| ↗ | HEAT WAVE. | ▽ | SQUALL. |
| < | LIGHTNING. | ⚡ | THUNDERSTORM. |
| VI | JUNE ETC. | 20/VII : 20 th JULY. | |
| 1, 2 W/ VIII | 1 st AND 2 nd WEEK OF AUGUST. | | |



DISASTROUS WEATHER EVENTS OF 1984

