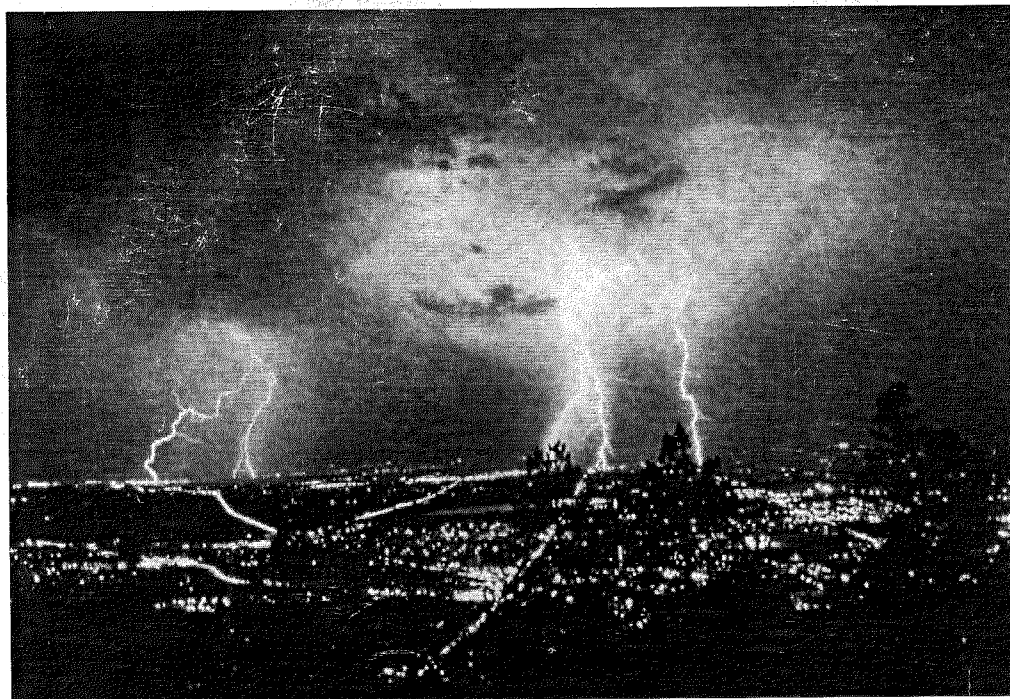


DISASTROUS WEATHER EVENTS 1997



ISSUED BY
OFFICE OF THE
ADDITIONAL DIRECTOR GENERAL OF METEOROLOGY (RESEARCH)



भारत सरकार
GOVERNMENT OF INDIA

भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

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ADDITIONAL DIRECTOR GENERAL OF METEOROLOGY (RESEARCH)

DISASTROUS WEATHER EVENTS OF 1997

The most striking disastrous weather events of 1997 were the following :

- i) Severe floods and heavy rains occurred over many parts of the country and claimed around 1300 human lives. Property worth Rs. 295 crores damaged and crops in 2.69 lakh hectares lost.
- ii) Severe cold wave conditions prevailed over northern parts of the country during January and December months in which more than 100 human lives lost.

The summary of these natural hazards is based on the various reports of the India Meteorological Department and press information. The figures for estimated losses are as per the press reports. The areas affected by the adverse weather phenomena are depicted seasonwise on four maps.

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S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE - I : SNOWFALL

CRITERIA

Moderate : 7.6 to 34.9 cm in 24 hrs

Heavy : ≥ 35.0 cm in 24 hrs

1.	19 Jan.	Shimla	Heavy		(i) Damage to telephones/powerlines reported (ii) Normal life paralysed (iii) 70 km stretch of river Chandrabhaga between Chandratal and Spiti frozen (iv) All lakes and ponds frozen
2.	21 Jan	(a) Lahaul and Spiti (b) Kangra, Shimla and Solan (c) Chamba (d) Darjeeling	Heavy Heavy Moderate Moderate	One person died at Dalhousie One woman died at Kurseong	320 km. Hindustan – Tibet highway closed. (i) Water-pipes burst due to ice formation. (ii) Transport dislocated. Normal life in Darjeeling disrupted.
3.	22 Jan.	Chamoli, Dehradun, Nainital, Pithoragarh, Tehri Garhwal and Uttarkashi	Heavy		(i) Normal life disrupted. (ii) Road traffic badly affected.
4.	24 Jan.	Chamba (H.P.)	Moderate	3 persons died	
5.	27 Jan.	(a) Kinnaur, higher reaches of Lahaul and spiti and Chamba	Heavy		(i) All lakes, ponds, rivulets and other natural sources of water including Chandrabhaga river between Chandratal and Spiti frozen. (ii) In Lahaul and Spiti and Chamba districts, temperatures of the order of -15°C to -35°C reported. (iii) Kunzum, Pangi and Rohtang Pass areas affected

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
		(b) Kashmir valley	Heavy		(i) Kashmir valley cut off from rest of the country. (ii) All incoming / outgoing flights cancelled. (iii) Srinagar – Jammu N.H. closed for vehicular traffic.
6.	5 Feb.	Dibang Valley, Tawang and West Siang	Heavy	Hundreds of domestic animals died.	Road / Telecommunication / Water supply disrupted at several places.
7.	8 Feb.	Mandi	Heavy	2 persons died	
8.	10 Feb.	Kinnaur, Lahaul and Spiti and Shimla	Heavy		(i) Normal life thrown out of gear. Vehicular traffic remained suspended for 3 days.
9.	11 Feb.	Bilaspur & Lahaul and Spiti	Heavy		(i) Normal life in Lahaul and Spiti and Pangti affected. Mercury dipped down between 20°C to 35°C
10.	16-22 Mar.	Tawang	Heavy		(i) Itanagar cut off from rest of the places. Bomdila – Tawang road cut off, traffic stranded.
11.	2 Aug.	Kashmir valley	Heavy		Pahalgam – Chandanwadi – Sheshnag – Mahaganus – Panchtarani road blocked. Amarnath pilgrims stranded.
12.	25 Oct.	Darjeeling	Moderate		6 to 7 inches of snow reported at Sandakphu and Falut.
13.	10 Nov.	Kullu	Heavy (Avalanche)	2 persons killed at Rohtang-pass due to avalanche.	
14.	28 Nov.	Kullu	Heavy (Avalanche)	Two persons buried alive and one person badly injured due to avalanche near Manali.	
15.	8 Dec.	Uttar Pradesh (Hilly areas)	Moderate		Rabi, Potato and Mustard crops damaged.
16.	9 Dec.	Upper reaches of Himachal Pradesh	Moderate		Normal life disrupted.
17.	30 Dec.	Shimla	Moderate		Electric wires over many roads in the town broken.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – II : COLD WAVE

CRITERIA

(A) Where; Normal minimum temperature is 10°C or more.
 Moderate cold wave : Night temperature 5° to 6°C below normal.
 Severe cold wave : Night temperature 7°C or more below normal.

(B) Where; Normal minimum temperature is less than 10°C.
 Cold wave : Night temperature 3° to 4°C below normal.
 Severe cold wave : Night temperature 5°C or more below normal.

1.	2 Jan.	(a) Ambala and Faridabad	Severe cold wave (B)	2 persons died.
2.	9 Jan.	Dhanbad	Moderate cold wave (A)	One person died at Manjhili
3.	16 Jan.	Samastipur	Severe cold wave (A)	9 persons died at Patonri.
4.	19 Jan.	Bareilly	Cold wave (B)	One person died.
5.	20 Jan.	Kota	Severe cold wave (B)	1 person died.
6.	20 & 21 Jan.	Patna	Severe cold wave (A)	13 persons died

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
7.	20-22 Jan.	Pune	Moderate to severe cold wave (A)		i) Lowest temperature of 4.8°C reported at Pune on 21 st . ii) Milk production in Maval tehsil reduced due to severe cold.
8.	20 - 23 Jan.	Garhwal and Kumayun region	Severe cold wave (B)	14 persons died.	
9.	24 Jan.	(a) Gaya (b) Purulia	Cold wave (B) Moderate cold wave (A)	One person died in Koanch block One old woman died at Bhagabandh	
10.	28 Jan.	Patna	Severe cold wave (A)	9 persons died.	
11.	4 Feb.	Patna	Moderate cold wave (A)	3 persons died at Paliganj	
12.	8 Dec.	Lucknow	Cold wave (B)	2 persons died	
13.	12 Dec.	Srinagar	Severe cold wave (B)	3 persons including 2 women died.	
14.	14 Dec.	(a) Bhojpur (b) Nalanda	Severe cold wave (A) Severe cold wave (A)	2 persons died at Dumram 6 persons died.	
15.	16 Dec.	Darbhanga	Severe cold wave (A)	2 persons died at Gherukh.	
16.	18-24 Dec.	Faizabad, Fatehpur, Haridwar, Moradabad and Pratapgarh	Severe cold wave (Both A & B as appropriate)	20 persons died.	
17.	19-25 Dec.	Punjab	Severe cold wave (B)	4 persons died.	
18.	21 Dec.	Madhubani	Severe cold wave (A)	3 persons died at Madhepur	

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
19.	22 Dec.	North 24 Parganas	Moderate cold wave (A)	One person died at Ultadanga.	
20.	23 Dec.	(a) Jaipur	Cold wave (B)	One person died.	
		(b) Nawada	Severe cold wave (A)	19 persons died.	
21.	24 Dec.	Purulia	Severe cold wave (A)	2 persons died.	
22.	25 Dec.	Begusarai	Severe cold wave (A)	12 persons died.	
23.	26-31 Dec.	Rajasthan	Severe cold wave (Both A & B as appropriate)	(i) 2 persons died in Alwar (ii) 6 persons died in Jaipur	

TABLE - III : HEAT WAVE

CRITERIA

(A) Where; Normal maximum temperature is 40°C or less.
Moderate heat wave : Day temperature 5° to 6°C above normal.
Severe heat wave : Day temperature 7°C or more above normal.

(B) Where; Normal maximum temperature is more than 40°C.
Heat wave : Day temperature 3° to 4°C above normal.
Severe heat wave : Day temperature 5°C or more above normal.

1.	13 & 14 May	Purulia	Moderate heat wave (A)	Two persons died	
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<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
2.	15 May	Malda	Moderate heat wave (A)	One person died and 10 other fell sick.	
3.	15 & 16 May	Calcutta	Moderate heat wave (A)	One old man and 2 women died	
4.	20-25 May	a) Adilabad	Severe heat wave (B)	4 persons died.	
		b) Krishna	Severe heat wave (A)	5 persons died at Machilipatnam	
5.	26 May	a) Jhalawar	Heat wave (B)	One person died.	
		b) Kota	Heat wave (B)	One person died.	
6.	27 May	Krishna	Moderate heat wave (A)	2 persons died.	
7.	1 Jun.	Guntur	Moderate heat wave (A)	2 persons died.	

TABLE – IV : DROUGHT

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S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – V : SQUALL

A sudden increase of wind speed by atleast 29 kmph (16 kts), the speed rising to 40 kmph (22 kts) or more and lasting for atleast one minute

CRITERIA

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

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

1.	11 Jan.	Amravati	Severe	3 women died at Karajgaon	
2.	29 Mar.	Aurangabad (Maharashtra)	Moderate	2 persons injured.	Roof tops of houses and a school building blown off about 1 km away at Ausa.
3.	3 Apr.	Gadchiroli	Severe		Standing crop damaged.
4.	30 Apr.	Pune	Moderate	19 persons injured at Khed.	
5.	8 & 9 May	Nalbari & Sonitpur	Moderate	-	Many houses damaged and trees uprooted.
6.	16&17 May	Kamrup and Sonitpur	Moderate	One person died in Guwahati	(i) Many houses damaged. (ii) Many trees and electric poles uprooted.
7.	28 May	Gaya	Severe	12 persons injured	Hundreds of trees uprooted.
8.	29 May	Patna	Severe	19 persons died.	Electric supply disrupted.
9.	1 Jun	Sonitpur	Moderate	One child died in Sutia sub-division	Six houses damaged.
10.	9,13 & 20 Oct.	Ernakulam, Kottayam, Idukki	Moderate		(i) Widespread damage to crops reported. (ii) Many trees uprooted and houses collapsed.
11.	25 Oct.	Kamrup and Sonitpur	Moderate		Several trees and electric poles uprooted disrupting power supply.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – VI : GALE

CRITERIA

Strong : Wind speed \geq 75 kmph

1.	31 Jul	Malappuram	Strong	40 persons injured.	7 houses fully and 50 houses partially damaged.
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TABLE – VII : DUSTSTROM

CRITERIA

Moderate : Wind speed between 39 to 74 kmph and horizontal visibility upto 500 metres

Severe : Wind speed \geq 75 kmph and horizontal visibility upto 50 metres.

1.	29 Apr.	Bundi	Severe		(i) Normal life affected. (ii) Electric/telephone poles damaged.
2.	4 May	Kanpur	Severe	One person died and three injured under an uprooted Neem tree.	
3.	22 May	Bikaner & Jaipur	Severe		(i) City life disrupted. (ii) Electricity supply and telecom services affected.
4.	28 May	(a) Hisar	Severe		Road/Railway tracks affected in Adampur.
5.	29 May	Many parts of Uttar Pradesh	Severe	(i) 19 persons died and 24 other injured. (ii) 24 cattleheads died and 12 cattleheads injured.	(i) Hundreds of houses fully damaged due to uprooting of thousands of trees. (ii) Damage to property worth crores of rupees reported.
6.	30 May	Ambala	Severe		In many parts of town, electric supply disrupted.
7.	19 Jun.	Lakhimpur Kheri	Severe	10 persons died and 20 other injured due to house collapse	Many houses damaged.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – VIII : LIGHTNING

1.	23 Mar.	Rangareddy		Two persons died and another two injured.	
2.	25 Mar.	Kollam		One person died at Kottarakkara.	
3.	29 Mar.	(a) Darjeeling		Four persons injured at Bandhunagar in Siliguri	
		(b) Solapur		One girl died in Tuljapur taluka.	
4.	30 Mar.	Medinipur		One person died and four injured at Kubai.	
5.	6 Apr.	Amravati		One person died.	
6.	15 Apr.	Madhubani		3 persons died at Simri.	
7.	16 Apr.	Kishanganj		3 persons died and another injured at Jurail.	
8.	24 Apr.	Raigad (Maharashtra)		4 persons injured at Poladpur.	
9.	28 Apr.	(a) Karimnagar and Nizamabad		6 persons died.	
		(b) Pali		4 persons died.	
10.	30 Apr.	Buldhana		One person died.	
11.	2,5 May	Idukki, Kottayam, Malappuram and Palakkad		6 persons died and 9 other injured.	
12.	3 May	(a) Shahjahanpur		5 persons including 4 children died.	
		(b) Yavatmal		One person died at Arni.	
13.	8,9,12,25 May	Alappuzha, Ernakulam, Kollam, Kottayam and Thiruvananthapuram		8 persons died and 30 students injured.	
14.	9 May	(a) Ernakulam and Kottayam		4 persons including two boys died.	
		(b) Pune		One person died in Junnar Taluka.	
15.	15 May	Bangalore		One person died.	
16.	16 May	Purulia		One girl died and 2 other injured at Lagerdi	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
17.	23 May	Bardhaman		9 persons injured including one child and 6 women at Meto-Danga.	
18.	26 May	(a) Hooghly		3 persons died and another injured at Chaparui	
19.	27 May	(b) Medinipur North 24 Parganas		One person died at Digha 3 persons and 2 women injured in Hasnabad area.	
20.	1 Jun.	(a) Bankura		One person died and one women injured at Salbani	
21.	2 Jun.	(b) Kheda North 24 Parganas		5 persons died at Kantharia near Anand. 3 persons died at Basirhat.	
22.	3 Jun.	Bankura		In Dubracone village, one person died and one woman injured and 7 animals died.	
23.	4 Jun.	East Singhbhum		6 persons died and one injured at Jamshedpur	
24.	5 Jun.	(a) Cuttack		8 persons including 2 children died and 7 other injured in Baranga.	
		(b) Jalgaon		3 farm workers died and 3 injured in Chalisgaon Taluka.	
		(c) Malappuram		One person and a girl died and one injured at Nilambur.	
25.	6 Jun.	Malappuram		One person injured at Nilambur.	
26.	7 Jun.	Idukki		One person died at Thodupuzha.	
27.	9 Jun.	Nagpur		One person died at Khandala.	
28.	10 Jun.	Nagpur		Three persons died at Dhargaon.	
29.	12 Jun.	Pune		(i) 3 persons including an infant died near Wagholi (ii) A few animals died	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
30.	13 Jun.	Thiruvananthapuram		One person died at Pothankodu.	
31.	14 Jun.	Yavatmal		One person died at Pusad.	
32.	15 Jun.	Nagpur		One woman died in Gada village.	
33.	17 Jun.	Fatehpur		3 persons including one woman died in Malaka Village.	
34.	19 Jun.	(a) Medinipur (b) Nagpur		5 persons including 2 children died in Sonapata, Baira and Contai villages One woman died and 5 injured at Bade-gaon.	
35.	20 Jun.	Medinipur		One person died in Contai village.	
36.	21 Jun.	(a) Bardhaman (b) South 24 Parganas		2 persons died in North Asansol. 2 persons died at Canning.	
37.	22 Jun.	(a) Junagadh (b) Kullu (c) Panchmahals		One person died. One woman died in Kalidar village One person died.	
38.	23 Jun.	Purulia		2 students died and 3 other injured in Agarpara	
39.	24 Jun.	(a) Banka (b) Palamu		Two persons died in Salimpur village. One person died in Takadi village.	
40.	1 Jul.	Giridih		2 persons died and 3 other injured in Teludih.	
41.	2 Jul.	(a) Madhepura (b) Hooghly		4 persons died at Sanghara One person died.	
42.	5 Jul.	Medinipur		One student died in Tangashol village.	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
43.	8 Jul.	(a) Uttar Dinajpur (b) Purulia		One person died at Raigunj One woman died and seven women injured at Chara.	300 telephone lines damaged.
44.	14 Jul.	(a) Nalanda		One person died at Barehanna in Rajgir tehsil.	
45.	16 Jul.	(b) Vaishali (a) Hooghly (b) Nadia		One person died at Hajipur One person died at Ramnathpur. 2 persons died.	
46.	19 Jul.	(a) Palamu (b) Nagpur		3 persons died at Daltonganj.	One building damaged in the Nagpur city.
47.	20 Jul.	South 24 Parganas		One woman and her son died in Kakkdip.	
48.	23 Jul.	Medinipur		2 persons died and 3 other injured.	
49.	24 Jul.	Bardhaman		3 persons died.	
50.	30 Jul.	Medinipur		2 persons died at Simul village.	
51.	31 Jul.	(a) Bardhaman (b) Darbhanga		One person died and 3 injured at Sikarpur village. One person died and two other injured.	
52.	3 Aug.	South 24 Parganas		2 persons died at Durgapur.	
53.	4 Aug.	(a) Darjeeling (b) Medinipur		One person died and 3 other injured at Thimnikata village. 2 persons died at Barbajithpur.	
54.	5 Aug.	Purulia		5 persons died.	
55.	8 Aug.	Purnea		4 persons died in Sarsi village.	
56.	11 Aug.	Lakhisarai		2 persons died at Thana Pipibazar.	
57.	12 Aug.	Birbhum		2 students died and 14 other injured at Dubrajpur.	
58.	17 Aug.	Patna		3 persons died at Naharpura	
59.	26 Aug.	Bardhaman		2 peasants died at Kana-Krishnapur	
60.	2 Sep.	Samastipur		8 persons including 5 students died.	
61.	11 Sep.	Yavatmal		One woman died in Pasera village.	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
62.	15 Sep.	Nagpur		3 persons died in Kharada village.	
63.	15 Oct.	Nagpur		6 persons died and 4 other injured.	
64.	20 Oct.	Tirunelveli		4 persons including one woman died.	
65.	25 & 29 Oct.	(a) Amravati		5 persons died and 9 other injured.	
		(b) Buldhana		3 persons died and 5 persons including 2 children and 2 women injured.	
66.	27 Oct.	(a) Jalgaon		3 persons died and 6 other injured at Jamner.	
		(b) Pune		3 persons died at Loni.	
67.	29 Oct.	Nagpur		2 women died and 8 injured.	
68.	3 Nov.	Malappuram		(i) 3 persons including one woman and her daughter died. (ii) 12 persons sustained burn injuries when lightning struck a house.	
69.	17 & 24 Nov.	Kottayam and Pathanamthitta		A few deaths reported.	
70.	18 Nov.	Nashik		One persons died in Satpur.	
71.	27 Nov.	(a) Nagpur		2 women died and 2 persons injured.	
		(b) Mandi		One cattlehead perished and 2 injured.	
72.	4 Dec.	Pune		A 16-year old girl died in Mulsi Taluka.	
73.	23 Dec.	Kozhikode		3 persons injured.	

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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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.	15 Mar.	Kozhikode	Moderate		Widespread damage to property and agriculture reported. Roof tops of more than 25 houses damaged. (i) Power supply cut off. (ii) Telephone lines out of order.
2.	22 Mar.	(a) Idukki (b) Kolhapur	Moderate Moderate		
		(c) Nadia	Moderate	One person died due to electrocution at Kalyani.	
3.	26 Mar.	Solapur	Severe		
4.	27 & 28 Mar.	Sangli	Severe		Damage to mango, grapes and rabi crop reported. (i) Jat, Miraj and Tasgaon talukas affected. (ii) Estimated loss due to damage of mango, banana, grape crops worth Rs. 2 crores reported.
5.	30 Mar.	Calcutta	Moderate	One person injured due to wall collapse.	
6.	1 Apr.	Medinipur	Severe		(i) 450 mud houses fully damaged and more than 1000 houses partially damaged. (ii) Damage to crop reported.
7.	1,6,9 Apr.	Idukki, Thiruvananthapuram and Thrissur	Severe		(i) Widespread damage to property and agriculture reported. (ii) Erattayar church collapsed.
8.	8 Apr.	North 24 Parganas	Moderate	One person died in a boat capsized at Nam-khana	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
9.	9 Apr.	(a) Calcutta (b) Medinipur	Moderate Moderate	5 persons injured due to uprooting of trees at Garbeta	Train/Aviation services badly affected. Many areas suffered power-cut.
10.	10 Apr.	(c) North 24 Parganas (a) Bhadrak (b) Calcutta (c) Malda (d) North 24 Parganas	Moderate Severe (Tornado) Moderate Moderate Moderate	A few persons injured at Barrackpore. 8 persons injured. One person died due to electric shock in Calcutta city. One person died. 2 persons died due to uprooting of trees at Chandanwar.	
11.	11 Apr.	Keonjhar	Severe (Tornado)	One person injured at Kabatbandha.	
12.	13 Apr.	(a) Bardhaman (b) Calcutta	Moderate Moderate	4 persons including 2 children died due to uprooting of trees at Rayna. 4 persons including 2 women injured under uprooted trees in city areas.	
13.	15 Apr.	Medinipur	Severe	(i) One woman died and 4 persons injured at Chakbagan. (ii) One woman died at Katapur.	1000 mud houses collapsed at Katapur.
14.	15,20,25,27 Apr.	Idukki, Malappuram and Thiruvananthapuram	Severe	3 persons died.	(i) About 1000 Banana trees damaged. (ii) Widespread damage to property and agriculture reported.
15.	20 Apr.	Darjeeling	Moderate		Some trees uprooted.
16.	24 Apr.	Raigad (Maharashtra)	Moderate	4 persons injured in Poldpur tehsil.	
17.	25 Apr.	(a) Bardhaman (b) Dakshin Dinajpur	Moderate Severe	At least 25 persons injured due to house collapse 3 persons died at Kashipur	Some mud houses collapsed. Many mud houses collapsed.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
18.	27 Apr.	(a) Bardhaman	Severe	2 persons died and 3 other badly injured in Jamalpur.	
		(b) Malda	Severe	5 persons including 3 women died and one woman injured due to wall collapse.	
		(c) Medinipur	Moderate	One woman died and 2 persons badly injured.	
19.	30 Apr.	Nashik		17 persons died and 25 other injured.	Several houses collapsed and trees uprooted.
20.	2 May	Himachal Pradesh	Severe		(i) Fruit and wheat crop affected. (ii) Trees uprooted. (iii) Roof tops of some kutcha houses blown off. (iv) Telecommunication services disrupted.
21.	4 May	Medinipur	Severe	5 persons died due to electrocution.	
22.	5 May	Bhopal	Moderate	One child died and one person injured at Deobandha	Trees/electric poles uprooted.
23.	7 May	Malda	Severe	One girl died due to uprooting of trees.	(i) Roof tops of many houses damaged. (ii) Many big trees uprooted. (iii) paddy crop badly damaged.
24.	8 May	West Tripura	Severe	One person died and 50 injured.	
25.	14 May	Bankura	Severe		(i) Vishnupur railway station badly damaged. (ii) Railway overbridge damaged due to uprooting of a big tree.
26.	20 May	(a) Birbhum	Severe		(i) Normal city life paralysed. (ii) Electric lines in many areas disconnected due to uprooting of electric poles. (iii) Many houses collapsed. Many mud houses damaged.
		(b) Nadia	Severe	One person died due to broken branch of a mango tree at Krishnagar.	
27.	24 May	(a) Hooghly	Moderate	One person died at Bakul	Train and bus services disrupted due to uprooted trees.
		(b) South 24 Parganas	Moderate	One person died at Baruiপুর	

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
28.	25 May	Hooghly	Moderate	2 persons died at Mogra and another died at Bandal.	
29.	26 May	(a) North 24 Parganas	Moderate	One 10-year old girl died and 2 persons injured in Habra area.	50 houses damaged and many trees uprooted.
		(b) South 24 Parganas	Moderate	2 persons drowned at Canning in a boat capsize.	
		(c) Nadia	Moderate	One person died under an uprooted mango tree at Gayeshpur and two women injured due to house collapse in Majhechar area.	36 mud houses badly damaged in Majhechar area.
30.	28 May	(a) Delhi	Severe	6 persons died.	
		(b) Nadia	Severe	In all 3 persons died in separate incidents in Bhimpur area.	
31.	2 Jun.	(a) Bardhaman	Moderate	3 persons died	
		(b) South 24 Parganas	Moderate	One person and his wife died in Shatmanisha village.	
32.	4 Jun.	Saurashtra region	Severe	6 persons died and 3 injured in 3 different places.	(i) Several trees and electric poles uprooted disrupting power supply. (ii) More than 300 families rendered homeless.
33.	10 Jun.	(a) Hooghly	Moderate	2 boys died due to wall collapse in Baichi village	
		(b) Nagpur	Severe	3 persons died in Dhargaon.	
34.	12 Jun.	(a) Ganjam	Severe	5 persons died and one injured in different parts of the district	(i) Damage to crops reported. (ii) Loss to property worth Rs. 50 lakhs reported.
		(b) Pune	Severe	(i) 3 persons including an infant died near Wagholi. (ii) 2 bulls died.	
35.	18 Jun.	Lakhimpur Kheri	Severe	10 persons died in a house collapse	
36.	21 Jun.	(a) North 24 Parganas	Moderate	One boy injured in Hajinagarh	Electric supply disrupted.
		(b) Panchmahals	Moderate	Two persons died.	

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
37.	28 Jun.	Malda	Tornado	32 persons injured.	(i) Whirling wind with violent circular current having a diameter of approx. 90 to 100 m, reported. Total length of the movement was 6 to 7 km. (ii) 700 houses damaged making over 400 families homeless. (iii) Many trees uprooted.
38.	22 Aug.	South 24 Parganas	Severe	A few persons injured	64 houses blown away and roofs of some houses blown away.
39.	30 Aug.	Nadia	Moderate	4 persons injured at Ghola village	40 houses damaged.
40.	29 Sept.	Saran	Moderate		Ice factory damaged at Rahimpur.
41.	10 Oct.	Jaipur, Nagaur and Sikar	Severe	(i) 2 persons and 2 children died (ii) 2 goats perished	Tents worth lakhs of rupees smashed in Jaipur city.
42.	25 & 26 Oct.	Nagpur	Severe		In Nagpur city and neighbourhood 300 houses damaged and more than hundred trees uprooted.
43.	28 & 29 Nov.	Ahmadnagar and Beed	Severe		(i) Jowar, Tur, Cotton crops damaged. Estimated loss worth lakhs of rupees reported. (ii) Roof tops of many houses at Talegaon blown away.
44.	27 Nov. – 3 Dec.	Ahmadnagar, Beed, Nashik, Osmanabad, Parbhani, Pune, Satara, Sangli, Solapur	Severe		(i) Damage to Jowar, gram, wheat, grapes, pommegranate crops reported. (ii) Tur and cotton crops in Beed, Parbhani and Potato crop in Satara damaged. (iii) Brick manufacturing in Pune district badly affected as unbaked bricks and coal washed away.
45.	3 Dec.	Nashik	Severe		(i) Trees uprooted, tree branches broken and electric poles fell down. (ii) Electric supply disrupted. (iii) Rabi crop affected.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – X : HAILSTORM

CRITERIA

Slight : Sparse, usually small size and often mixed with rain

Moderate : Fall abundant enough to whiten ground

Heavy : Includes at least a proportion of large stones

1.	11, 17 Jan.	Dhule, Jalgaon, Nashik	Heavy	(i) One old woman died at Vikharan (Sindkheda tehsil) (ii) Several goats and bullocks killed at Sumbha, Ner and Nandurbar	i) Rabi crop, banana, mango and grapeyard damaged. ii) About 25 houses damaged in Sinnar tehsil.
2.	12 Jan.	(a) Nashik (b) West Nimar	Moderate Moderate		i) In Malegaon city and neighbourhood standing grapes, pomegranate, onion, gram and other horticultural products damaged. ii) Several trees uprooted and telecom lines damaged. Crops in 500 acres of land damaged in Bhamori, Gat-lakhedi, Rasgaon and Segaoon.
3.	12, 18 Jan.	Beed	Heavy		Beed taluka worst affected. Estimated loss of Rs. 90 lakhs reported. Crops in 3564.74 hectares damaged.
4.	28Jan.	Aurangabad (Maharashtra)	Severe	Two persons injured.	(i) Orchards damaged. (ii) Normal life disrupted. (iii) Tin roofs blown away at many places. (iv) Wheat crop affected.
5.	13Mar.	Kamrup	Moderate		Rabi crop in Mirza circle damaged.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
6.	22Mar.	North 24 Parganas & South 24 Parganas	Heavy		(i) 8 cm diameter hail reported at Diamond Harbour. (ii) Damage to crop in many areas reported. (iii) One school building in Baruipara (North 24 Parganas) damaged.
7.	24Mar.	Karimnagar	Moderate		Extensive damage to standing crop reported.
8.	26Mar.	(a) Birbhum (b) Waynad	Moderate Moderate		Boro crop in Sailhia and Mayurakshi damaged. 35 houses damaged at Batheri.
9.	26,27 & 28 Mar.	Beed, Latur and Osmanabad	Heavy	Two persons died and one injured in Beed district.	(i) Standing rabi crop damaged. Heavy losses to grape and mango gardens reported. (ii) Roof tops of many houses blown away at a distance of 0.5 to 1.0 km.
10.	28 Mar.	Bikaner and Jaipur	Heavy		Wheat, barley and gram crops affected.
11.	30 Mar.	(a) Bardhaman (b) East Singhbhum (c) Medinipur (d) Nadia	Heavy Heavy Moderate	4 persons including two women died at Jamshedpur. One person died	(i) In Sanko and Bhuri, roof tops of 500 houses damaged. (ii) 2000 people became homeless. (iii) Crops in vast areas damaged. 150 mud houses fully and 200 partially damaged at Contai.
12.	1 Apr.	(a) Ajmer, Banswara, Jaipur, Sikar and Udaipur (b) Jind and Sirsa	Heavy Moderate		Crops in vast areas of Kaliganga damaged. Wheat, barley and mustard crops damaged.
13.	2 Apr.	(a) Bardhaman (b) Gwalior	Heavy Moderate		Crops damaged. Roof tops of 500 houses damaged making 2000 people shelterless at Galshi. Standing crop damaged.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
14.	3 Apr.	(a) Ajmer, Bharatpur, Hanu-mangarh, Jaipur, Jhunjhunu and Udaipur (b) Kangra (c) Almora, Bareilly, Moradabad, Nainital and Pithoragarh	Heavy Moderate Heavy		Wheat and barley crop damaged. Potato crop in Kangra valley damaged. Standing crop damaged.
15.	3,4 & 16 Apr.	Krishna, Mahbubnagar, Nalgonda, Rangareddy and Warangal	Heavy		(i) Extensive damage to standing crop reported. (ii) Roofs of many thatched houses blown off. (iii) Many trees uprooted. (iv) Mango crop in 1000 acres damaged. (v) Estimated damage worth Rs. 2.6 crores.
16.	4 Apr.	Bhilwara, Jaipur, Sikar and Tonk	Moderate		Rabi crop damaged.
17.	5 Apr.	(a) Gurgaon, Jind, Mahendergarh and Panchkula (Haryana) (b) Kangra (Himachal Pradesh)	Moderate Moderate		Wheat crop badly damaged.
18.	5 & 6 Apr.	(c) Mansa and Moga (Punjab) Bhandara, Chandrapur and Wardha	Moderate Moderate		Wheat crop badly damaged at Kalka, Kangra and Narwana Wheat crop badly damaged. Orange and other crops damaged.
19.	8 Apr.	Jajpur	Moderate	One person died	
20.	9 Apr.	Bardhaman, Hooghly and North 24 Parganas	Heavy	(i) A few persons injured at Barrackpore in North 24 Parganas. (ii) One peacock died and 10 other injured at Rajahat in Hooghly district.	Many mud houses damaged making several people shelterless.
21.	10 Apr.	Nadia	Heavy	3 persons died and 5 injured at Haskhali and Ranaghat	(i) Many mud houses damaged. (ii) Damage to crop reported.
22.	11 Apr.	Patna	Moderate		Mango and wheat crop damaged at Phulwari Sharif.
23.	15 Apr.	Mandi	Moderate		Standing wheat crop damaged.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
24.	26 Apr.	Muzaffarpur and Samastipur	Heavy	31 persons died	(i) Large size hail reported. (ii) Standing wheat crop and mango damaged.
25.	28 Apr.	Patiala, Una	Heavy		Huge damage to standing crop reported.
26.	29 Apr.	(a) Patiala (b) Una	Heavy Heavy		Huge damage to standing crop reported. Huge damage to standing crop reported.
27.	6, 7 & 8 May	Hamirpur (Himachal Pradesh)	Heavy		More than 40% of wheat crop affected.
28.	7 May	Medinipur	Heavy		Paddy, jute and vegetables badly damaged.
29.	8 May	Hamirpur (Uttar Pradesh)	Heavy		More than 40% of wheat crop damaged.
30.	25 May	Nawada	Moderate	3 persons died.	
31.	26 May	Bharatpur	Heavy	Many birds perished.	
32.	27, 28 May	Jind and Karnal	Moderate		i) Vegetable/fruit crops affected. ii) Water/power supply/telecommunication links disrupted.
33.	30 May	Lakhisarai	Heavy	14 persons died	
34.	1 Jun.	(a) Ghaziabad (b) Ganganagar and Hanu-mangarh	Heavy Heavy	12 persons died and 7 other injured 12 persons died.	Many houses collapsed.
35.	2 Jun.	Darrang	Moderate		In Duni area, (i) Many houses damaged (ii) Standing crop damaged (iii) Several trees uprooted
36.	3 Jun.	Himachal Pradesh (Entire State)	Moderate		(i) Many trees uprooted. (ii) Electricity/telephone lines affected.
37.	15 Jun.	Vaishali	Heavy	12 cattleheads killed in Hajipur	
38.	29 Sept.	(a) Chamba (b) Saran	Heavy Moderate		Maize and rice crops destroyed badly at Dalhousie. Ice factory at Rahimpur (Marbouraw) damaged.
39.	14 Oct.	Nagpur	Moderate		Many trees in Nagpur city uprooted.
40.	15 Oct.	Bhopal	Moderate		Soyabean crop affected.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity</i>	<i>Casualties</i>	<i>Extent of damage</i>
41.	19 Oct.	Sikar	Heavy	Hundreds of birds perished.	
42.	24 Oct.	Churu and Sikar	Heavy	One dozen goats, one camel and 4 buffaloes died.	Damage to crops reported.
43.	27 Oct.	Vidarbha region	Moderate	Many cattleheads died at Bhum	Damage to crops reported.
44.	29 Oct.	(a) Rai Bareli	Heavy	One person died	(i) Damage to crops reported. (ii) Road traffic disrupted due to uprooted trees.
		(b) Sikar	Heavy		Crop in 5 km area completely destroyed.
45.	29 Oct. & 4 Nov.	Nagpur	Heavy		(i) Orange, cotton and soyabean crops in villages affected.
46.	10 Nov.	Solan	Moderate		Entire hill resort of Kasauli covered with 2 inches thick layer of hail.
47.	18 & 19 Nov.	Bhopal and Mandsaur	Heavy	(i) 2 persons died and many others injured. (ii) Many birds died and many cattleheads injured.	(i) Damage to crops reported. (ii) Many trees uprooted. (iii) Roof tops of many kutcha houses damaged. (iv) Electricity supply disrupted.
48.	19 Nov.	Akola	Heavy	Several persons injured.	(i) 57 villages affected. (ii) 7,940 hectares of cropland affected. (iii) Loss due to failure of crops worth Rs. 2 crores.
49.	22 Nov.	Akola	Heavy	(i) Many birds perished. (ii) Many cattleheads died.	Damage to crops reported.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
50.	25 Nov.	Rai Bareli	Heavy	(i) 2 persons died. (ii) Many cattleheads injured.	(i) Hail weighing 250 gm reported. (ii) Chilly crop in 8-10 lakh acres and bottlegourd, tomatoes, potatoes and sugarcane crop also damaged. (iii) Several kutcha houses damaged. (iv) Estimated loss of Rs. 70 lakhs reported.
51	27 Nov & 1,2, 3 Dec.	Azamgarh, Chandauli, Hardoi, Mau , Sultanpur & Varanasi	Heavy	(i) 36 persons died and 50 injured. (ii) Several animals perished.	(i) Land covered with hailstone layer 1½ to 2' ft. in thickness. (ii) Hundred of kutcha houses razed to ground and roofs of several houses blown off. (iii) Electric and telephone poles uprooted. (iv) Standing potato and mustard crop badly damaged.
52.	26 Nov.& 4 Dec.	Pune	Heavy		Damage to jowar, grapes, sugarcane, onion, wheat and gram crops and flower reported.
53.	28 Nov.	Akola	Heavy	Many birds perished and several cattle-heads died	Damage to crops reported.
54.	3 Dec.	(a) Ahmednagar	Heavy		Jowar, wheat, onion and gram crops in Kopargaon taluka affected.
		(b) Dhule	Heavy		Estimated loss of lakhs of rupees due to damage to fruit gardens reported.
55.	7 Dec.	(a) Faridabad	Moderate		i) Damage to mustard and wheat crop reported. ii) Normal life disrupted
56.	9 Dec.	(b) Kota Ajmer, Alwar, Kota and Sawai Madhopur	Heavy Heavy	2 persons died Two persons died	Many houses damaged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
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TABLE – XI : FLOODS AND HEAVY RAINS

ANDHRA PRADESH

1.	18 Mar.	Mahbubnagar	Heavy rains		(i) Extensive damage to paddy, tomato and mulberry crop spread over 1000 acres reported. (ii) Mango trees uprooted. (iii) Local telephone exchange panel board burnt due to short circuit disrupting communication system. (iv) Total loss estimated worth Rs. 1 crore. 1500 families rendered homeless.
2.	Sept. (2 nd week)	Ananthapur, Chittoor, Guntur, Krishna, Kumool Nellore and Prakasam	Heavy rains	44 persons died	
3.	Sept. (4 th week)	Guntur, Hyderabad, Krishna, Prakasam, Visakhapatnam, West Godavari and East Godavari	Heavy rains	i) 32 persons died ii) 326 cattle perished.	(i) Thousands of people rendered homeless. (ii) 39 tanks breached, 1470 houses damaged.
4.	Oct. (4 th week)	Khammam and Nellore	Flash flood (Munaru)	9 persons died.	
5.	Nov (4 th week) to Dec (2 nd week)	Chittoor, Nellore and Prakasam	Severe flood	14 persons died.	(i) 2250 houses damaged. (ii) Breaches to roads and tanks reported. (iii) Paddy, groundnut, chilly, blackgram and tobacco crop in 22,100 hectares area of Prakasam district damaged.
*	Whole year	0.184 million hectares		i) 58 persons died ii) 137 cattle perished	i) 5.098 million population affected ii) Crop in 0.184 million hectare damaged iii) 14,990 houses damaged

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
ARUNACHAL PRADESH					
1.	3 Jun.	Itanagar	Heavy rains		Itanagar cut off from rest of the state due to landslides. Road-links at several places disrupted
2.	18-19 Jun.	Lower Subansiri	Flash flood	8 persons died	
*	Whole year	Negligible		8 persons died	0.014 million population affected
ASSAM					
1.	17 May	Sonitpur	Heavy rains		(i) In Tezpur, several houses damaged.
2.	1 Jun.	Dhemaji	Flash flood (Gai)		(ii) Many trees/electric poles uprooted. Road communication between Dhemaji and Jonai disrupted.
3.	10-30 Jun	Barpeta, Dhemaji, Goalpara, Jorhat, Lakhimpur and Nalbani	Severe floods (Brahmaputra and its tributaries, Dikrang Ranganadi, Singra and Pava),	One person died in Barpeta	(i) 32,641 hectares of land affected, standing crop in 2805 hectares of land affected. (ii) Population affected 92,332. (iii) Road communication disrupted. (iv) Relief camps opened to provide succour to the affected people.
4.	5 Jul.	Sonitpur	Flash flood (Gabharu)		3 villages in Dhekiajuli sub-division inundated affecting 186 families.
5.	Jul. (2 nd & 3 rd week)	Almost 75% of the state	Severe floods (Brahmaputra and its tributaries)	10 persons died.	(i) 3016 villages affected (ii) Approx. 5.16 lakh hectares of land affected (iii) Approx. 0.75 lakh hectares of crop land affected. (iv) 4770 houses damaged. (v) Road communication on National Highway Nos. 52 & 53 affected.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
6.	Sept. (3 rd & 4 th week)	Dhemaji and Sonitpur	Severe flood (Brahmaputra and its tributaries, Jia-Bharali and Gabharu)	2 persons died.	(i) 240 villages inundated. (ii) Standing Sali crop and another 600 bighas of crop area damaged. (iii) Road communication between Dhemaji-Silapathar disrupted.
7.	29 Sept.	Cachar	Moderate floods (Barak and Katakhal)		(i) Vast areas flooded, damaging standing crops. (ii) Roads links between Silchar – Imphal and Silchar – Badarpur disrupted.
*	Whole year	0.753 million hectares		i) 28 persons died ii) 1961 cattle perished	i) 2.751 million population affected ii) Crop in 0.103 million hectares damaged iii) 18,104 houses damaged
BIHAR					
1.	2 Jul.	Madhubani	Heavy rains		(i) Telephone wires snapped at many places. (ii) Electric supply disrupted (iii) Paddy crop damaged
2.	18 Jul.	Katihar, Muzaffarpur, Sitamarhi and Siwan	Flash flood (Bagmati)	15 persons washed away	Crop in 6000 hectares affected.
3.	21 Jul.	Patna	Heavy rains	5 persons died due to wall collapse at Patna Medical college.	
4.	Aug. (1 st – 3 rd week)	Entire state	Severe flood	65 persons reported dead.	(i) 55 lakh inhabitants in 20 districts affected. (ii) Standing crop destroyed. (iii) Many houses collapsed.
*	Whole year	1.471 million hectares		i) 163 human lives lost ii) 151 cattle lost	i) Crop in 0.655 million hectares damaged ii) 6.965 million population affected iii) 1,74,379 houses damaged

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
GUJARAT					
1.	Jun. (4 th week)	Ahmadabad, Banaskantha, Bharuch, Kheda, Mehsana, Panchmahals, Sabarkantha, Surat, Surendranagar	Severe flood (Sarbarmati)	172 persons died.	(i) 30,000 people evacuated to safer places. (ii) Road communication disrupted. (iii) 1615 houses and 14,685 huts destroyed. (iv) Estimated loss of Rs. 550 crore reported.
2.	27 Jul.	Bharuch, Sabarkantha and Vadodara	Severe flood (Narmada)		6000 people and 4500 cattleheads shifted to safer places.
3.	7 Aug.	Kheda	Heavy rains	5 persons died.	
4.	25 Aug.	Ahmedabad	Heavy rains	10 persons died	10,000 people shifted to safer places.
5.	26-28 Aug.	Ahmedabad, Gandhinagar, Kheda, Sabarkantha, Surat, Vadodara, Valsad	Heavy rains	25 persons died.	20,000 people evacuated to safer places.
*	Whole year			i) 55 human lives lost ii) 795 cattle lost	i) 2.118 million population affected ii) 32,877 houses damaged
HARYANA					
1.	9 Dec.	Yamunanagar	Heavy rains	One employee of telecom department electrocuted.	
*	Whole year	0.010 million hectares		i) 3 persons died ii) 2 cattle lost	i) Crop in 0.002 million hectares damaged ii) 1024 houses damaged

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
HIMACHAL PRADESH					
1.	2 Aug.	Chamba	Heavy rains	i) 4 persons died and 150 sheep killed due to landslide at Bharmour. ii) 4 jawans drowned in Beas river.	Landslides reported.
2.	3 Aug.	a) Lahaul and Spiti b) Shimla	Heavy rains Heavy rains	One killed in a landslide in Udaipur area. 2 persons washed away in Nahan	
3.	11 & 12 Aug.	Kinnaur and Shimla	Flash flood (Andhar)	140 persons feared killed due to cloud burst	i) Equipments like tankers, jeeps of Nathpa – Jhakri Power Corporation Hydro-Electric project swept away. ii) Property worth crores of rupees destroyed. iii) One hundred houses destroyed due to landslides.
4.	29 Aug.	Kullu	Heavy rains		i) In Manali, several villages flooded ii) Manali-Leh highway blocked
5.	10 Nov	Lahaul & Spiti	Heavy rains		i) Several villages flooded ii) Manali-Leh highway blocked and 21 passenger buses stranded.
*	Whole year	0.254 million hectares		i) 229 human lives lost ii) 4809 cattle perished	i) 2.855 million population affected ii) Crop in 0.254 million hectares damaged iii) 13,943 houses damaged
JAMMU & KASHMIR					
1.	Aug. (4 th week)	Kashmir valley	Moderate flood (Jhelum & its tributaries)	i) 48 persons died due to flood and house collapse. ii) 474 cattleheads perished.	i) Jammu-Srinagar 300 km road blocked for vehicular traffic and passengers were stranded due to landslides. ii) Road communication disrupted.
*	Whole year	0.017 million hectares		i) 80 human lives lost ii) 17671 cattle lost	22,560 houses damaged

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
KARNATAKA					
1.	30 Apr. & 1 May	Raichur	Heavy rains	3 persons died.	
2.	13 May	Mysore	Heavy rains	6 persons injured.	
3.	27 Jun.	Kodagu	Heavy rains	One person died due to wall collapse.	
4.	1,10,11 & 26 Jul.	Dakshina Kannada	Heavy rains	10 persons died	<ul style="list-style-type: none"> i) 15 houses collapsed. ii) 39 houses partially damaged. iii) 10 hectares of agricultural land submerged. iv) 1139 km road damaged. v) 76 bridges damaged. vi) Total estimated loss of Rs. 9.22 crore reported.
5.	1 Oct.	Bangalore	Heavy rains	4 persons died and 20 other injured.	<ul style="list-style-type: none"> i) Low lying areas inundated. ii) Several huts in slum area swept away.
6.	4 Oct.	Dharwad	Flash flood (Benehalla)	6 persons washed away and 3 injured in flash flood near Tadahala – Navalgund.	
7.	27 Oct.	Chikmagalur	Heavy rains	2 persons died.	<ul style="list-style-type: none"> i) Estimated loss Rs. 1.4 crores reported. ii) 10 houses damaged. iii) Standing crop destroyed in several places around the city.
8.	24-27 Nov.	Shimoga	Heavy rains		<ul style="list-style-type: none"> i) Many houses damaged. ii) Standing as well as harvested crop destroyed. iii) Property worth lakhs of rupees destroyed.
9.	26 Nov.	Mysore	Heavy rains		<ul style="list-style-type: none"> i) Low lying areas inundated ii) Normal life disrupted. iii) Damage to crops reported.
*	Whole year	0.019 million hectares		<ul style="list-style-type: none"> i) 92 persons died ii) 120 cattle perished 	<ul style="list-style-type: none"> i) Crop in 0.019 million hectares damaged ii) 6333 houses damaged

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
KERALA					
1.	7 May	Kottayam	Heavy rain		(i) Damage to property reported. (ii) Road traffic disrupted due to landslide. (iii) Loss of vegetables reported.
2.	30 Jun.	Ernakulam	Heavy rains		(i) Normal life disrupted. (ii) Rail traffic disrupted following heavy water (iii) 250 families shifted to safer places
3.	1-12 Jul.	Kannur, Kasaragode, Kottayam, Kozhikode, Malappuram and Thiruvananthapuram	Heavy rains	30 persons died.	Logging of tracks between Aluwa – Ernakulam. Estimated loss to property worth crores of rupees reported.
4.	20-24 Jul.	Idukki and Kottayam	Heavy rains	i) 18 villagers including 5 women buried alive in massive landslide at Man-nankandom. ii) Many persons injured.	(i) Landslides reported. (ii) Widespread damage to property and agriculture reported.
5.	24 & 26 Jul	Alappuzha and Malappuram	Heavy rains	3 persons injured in Poyilkavu area	(i) 56 houses fully and 2654 partially damaged. (ii) Damage to agricultural land and property reported.
6.	8-10 Aug.	Malappuram, Thiruvananthapuram and Thrissur	Heavy rains		6 houses collapsed.
7.	12 Sept.	Kottayam	Heavy rains		(i) Landslides reported. (ii) Widespread damage to agriculture and property reported. (iii) Road at Moonnilavu Panchayat washed away.
8.	22 Sept.	Thiruvananthapuram	Heavy rains		(i) Number of houses collapsed. (ii) Damage to agriculture and property reported at Vamanapuram

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
9.	3-11 Nov.	Alappuzha, Idukki, Kottayam, Malappuram and Pathanamthitta	Heavy rains	7 persons died and 2 other injured	(i) Trees/electric/telephone lines uprooted. (ii) Damage to many houses reported.
10.	28 Nov.	Idukki	Heavy rains		(i) One bridge collapsed. (ii) Damage to agriculture reported.
11.	16 Dec.	Ernakulam	Heavy rains	2 children died.	One house collapsed.
*	Whole year	0.385 million hectares		i) 149 persons died ii) 183 cattle lost	i) 0.95 million population affected ii) Crop in 0.09 million hectares damaged iii) 16,109 houses damaged
MADHYA PRADESH					
1.	23 & 24 Aug.	a) Balaghat b) Bhopal c) West Nimar	Flash flood Heavy rains Flash flood	3 persons died One person died in a house collapse One person died at Khargone	
*	Whole year	0.022 million hectares		i) 14 human lives lost ii) 1263 cattle perished	i) 0.456 million population affected ii) Crop in 0.022 million hectares damaged iii) 47,963 houses damaged
MAHARASHTRA					
1.	12 Jan.	Nashik	Heavy rains		(i) Several trees uprooted (ii) Standing crop like grapes, onion, pomegranates affected.
2.	17 Jan.	Nashik	Heavy rains	i) One old woman electrocuted in Sindkhed taluk ii) Several cattleheads perished	Damage to some houses and to standing crop worth Rs. 2 crores reported.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
3.	2 Apr.	Nashik	Heavy rains	One 6-year old boy swept away in the Godavari river	(i) Normal life Paralysed. (ii) Extensive damage to standing crop, onion, grapes and vegetables reported. (iii)
4.	25 Apr.	Pune	Heavy rains	5 persons including 3 children died.	(i) Electric supply disrupted in Khed tehsil. (ii) Many houses damaged. (iii) Many trees uprooted. (iv) Estimated loss worth Rs. 63 lakhs reported. (v) Tin roofs flown away (vi) Asbestos roofs crushed due to hail (vii) Road communication disrupted.
5.	11 Jun.	Pune	Heavy rains		(i) Electric supply disrupted. (ii) Water logging at some places in Pune city. (iii) Train services delayed.
6.	14 Jun.	a) Jalgaon b) Satara	Heavy rains Flash flood (Wang)	2 women swept away in Patan	Thatched houses damaged, many trees uprooted, electricity supply disrupted.
7.	17 Jun.	c) Jalna Pune	Heavy rains		Power supply of wires disrupted due to snapping. One temporary bridge damaged.
8.	18-23 Jun.	Mumbai City, Mumbai (Sub) & Thane	Heavy rains	16 persons died and 24 injured at different places due to landslide / uprooting of trees / blown off roof-tops of houses.	i) 150 houses badly damaged. ii) Telephone services disrupted.
9.	21 Jun.	Mumbai (Sub)	Heavy rains	One person died and 6 injured due to landslide at Ghatkopar.	
10.	29 Jun.	a) Mumbai city b) Pune	Heavy rains Heavy rains	One person died and 8 other injured due to building collapse.	15 poles uprooted, wires snapped off, disrupting telephone services in Purandar, Neera, Walhe, Vir and Parinche areas.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
11.	5-7 Jul.	Mumbai City, Mumbai (Sub.), Raigad, Ratnagiri, Sindhudurg and Thane	Heavy rains	i) One person died and one injured at Worli. ii) A few passers-by injured when a building near Metro cinema collapsed.	i) Normal life disrupted. ii) Railway communication disrupted. iii) Waterlogging at many places reported. iv) Business in flower/vegetable/fruit market affected. v) 3 cars crushed under a wall collapsed at Worli. vi) A few trees uprooted.
12.	6 Jul.	Jalgaon	Heavy rains	3 persons died	One house collapsed.
13.	Jul. (2 nd week)	Kolhapur	Flash flood (Panchganga and its tributaries)		i) Many people shifted to safer places from river bank. ii) Normal life disrupted due to water logging at many places.
14.	19 Jul.	Satara	Heavy rains		Observatory tower collapsed at Mahabaleshwar.
15.	27 Jul.	a) Nashik b) Ratnagiri	Heavy rains Heavy rains		City life disrupted. Railway services disrupted.
16.	2 Aug.	a) Mumbai City b) Kolhapur	Heavy rains Heavy rains	6 persons died and 21 other injured. 2 persons washed away.	One building collapsed in south Mumbai.
17.	7 Aug.	Kolhapur	Heavy rains	5 persons washed away.	
18.	10 Aug.	Pune	Heavy rains	One person died and 20 other injured.	Vehicular traffic on Pune-Thane road disrupted due to landslides near Malshej Ghat.
19.	18 Aug.	Pune	Heavy rains		Groundnut, rice, millet etc. affected in Mulshi taluka.
20.	22-24 Aug.	Entire state	Heavy rains	i) 40 persons died of which 25 from Mumbai and Thane alone. ii) Dozens of people injured.	i) Several thousand people rendered homeless. ii) Normal life disrupted.
21.	22-25 Aug.	Jalgaon	Heavy rains		iii) Road/Railway traffic paralysed. i) Estimated loss worth Rs. One crore reported due to damaging of roads.
22.	24-26 Aug.	Nashik	Flash flood (Godavari)		ii) Road communication disrupted. i) 168 families rendered homeless. ii) Estimated loss to property worth Rs. 35 lakhs reported.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
23.	25 Aug.	Sangli, Solapur	Flash flood		i) 70 villages surrounded by flood water. ii) Bridge on Bhima river in Pandharpur was closed for vehicular traffic.
24.	27 Aug.	a) Nagpur b) Solapur	Heavy rains Flash flood (Bhima)	One person died due to house collapse.	i) Around 20,000 people shifted to safer places. ii) Pilgrimage city of Pandharpur was almost submerged and normal life disrupted.
25.	23 Sept.	Wardha and Yavatmal	Heavy rains	2 persons died in Arni and Shirpur.	
26.	25 Oct.	Buldhana	Heavy rains		Heavy damage to Cotton, Jowar, Kharif crop and orange reported.
27.	29 Oct.	Nagpur		2 women died and 8 injured.	
28.	30 Oct.	Thane	Heavy rains		Electric supply disrupted at Ambarnath.
29.	27 & 28 Nov.	Ahmadnagar	Heavy rains		Rabi jowar and cotton crop affected.
30.	28 Nov.	Nagpur	Heavy rains		i) Cotton crop and collected cotton affected. ii) Water logging in hutment areas.
31.	28 Nov – 4 Dec.	Aurangabad and Jalgaon	Heavy rains		Corn, sunflower and jowar crops affected at Sillod taluk.
32.	2 Dec.	Nashik	Heavy rains		Onion crop destroyed at Lasalgaon.
33.	3 Dec.	Jalgaon	Heavy rains		Banana, cotton crop and vegetables affected.
34.	4 & 5 Dec.	Amravati, Nagpur and Wardha	Heavy rains	2 persons died.	i) Many trees uprooted. ii) Roof tops of many houses blown away. iii) Damage to crops reported.
35.	Dec. (1 st week)	a) Pune b) Satara	Heavy rains Heavy rains		i) Normal life paralysed. ii) Electric supply disrupted at many places. i) Damage to grape garden reported. ii) Estimated loss worth lakhs of rupees reported. iii) Rabi crop affected.
36.	6-8 Dec.	Mumbai City	Heavy rains		i) Train services delayed. ii) Normal life affected.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
37.	8 Dec.	a) Kolhapur	Heavy rains		i) Damage to tomato and grape reported. ii) Estimated loss worth crores of rupees due to water logging at brick field.
		b) Pune	Heavy rains		40% rabi crop damaged.
		c) Parbhani	Heavy rains		2000 quintal cotton crop damaged in Pathari taluk.
		d) Osmanabad	Heavy rains		Damage to grapes in Tuljapur reported.
38.	Dec. (2 nd week)	Ahmadnagar	Heavy rains		Jowar, wheat, gram, cotton, grapes and vegetable crops damaged.
39.	10 Dec.	Nagpur	Heavy rains		Damage to crops/fruits/vegetables reported.
*	Whole year	0.049 million hectares		i) 199 persons died ii) 318 cattle perished	i) 0.797 million population affected ii) Crop in 0.049 million hectares damaged iii) 35,034 houses damaged

MANIPUR

1.	28 Sept.	Thoubal	Flash flood (Moirang, Nambul and Wang-jing)		i) Standing crop in thousands of hectares in Manipur valley were under water. ii) Several villages submerged in flood water. iii) Road communication on N.H. No. 53 disrupted.
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MEGHALAYA

1.	23 Jun.	West Garo Hills	Flash flood (Jinjiram and Rangai)		i) 12,000 hectares of land flooded. ii) Standing crops damaged.
2.	1 Jul.	West Garo Hills	Flash flood		i) Large areas inundated ii) Standing crops damaged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
MIZORAM					
1.	14 Jul.	Chhimtuipui and Lunglei	Flash flood		i) Large areas inundated. ii) Standing crops damaged.
*	Whole year	0.002 million hectares		7 persons died	i) 0.002 million population affected ii) Crop in 0.002 million hectares damaged iii) 1634 houses damaged
ORISSA					
1.	29 Jun.	Balasore	Flash flood (Subarnarekha)		3.65 lakh people in 388 villages affected.
2.	Aug. (1 st to 3 rd week)	Entire state	Severe floods (Baitarani, Kusumi, Kuamia, Lunijhara, Mahanadi and Subarnarekha)	65 persons died	i) 12 lakh people affected. ii) Over 1.41 lakh hectares of land under paddy cultivation damaged.
*	Whole year	0.775 million hectares		i) 34 persons died ii) 61 cattle perished	i) 5.282 million population affected ii) Crop in 0.444 million hectares damaged iii) 50,408 houses damaged
PUNJAB					
1.	4 Aug.	Patiala	Flash flood	37 persons including 19 children rescued.	
2.	27 Aug.	Entire state	Heavy rains	6 persons died and more than dozen injured.	

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
3.	27 Aug. – 3 Sept.	Southern Punjab	Heavy rains		More than one lakh people affected due to inundation.
*	Whole year	0.086 million hectares		i) 22 persons died ii) 75 cattle lost	i) Crop in 0.086 million hectares damaged ii) 10,685 houses damaged
RAJASTHAN					
1.	26 & 27 Jul.	Banswara and Dungarpur	Heavy rains		Hundred of houses collapsed.
2.	29-30 Jul.	Ajmer, Jaipur and Kota	Flash flood	15 persons washed away in separate incidents.	
3.	1-3 Aug.	Ajmer, Kota and Sirohi	Heavy rains	i) 17 persons died. ii) Some animals swept away by water current.	i) Several roads closed. ii) Many trains diverted. iii) Many places in Ajmer district submerged.
4.	25-29 Aug.	Ajmer, Alwar, Banswara, Baran, Bhilwara, Bikaner, Bundi, Chittorgarh, Churu, Dausa, Dungarpur, Jaipur, Jalore, Jhun Jhunu, Jodhpur, Kota, Nagaur, Pali, Sawai Madhopur, Sikar, Sirohi and Tonk	Heavy rains	29 persons died and 37 injured in different incidents.	Many houses damaged.
5.	4 Oct.	Ajmer and Bikaner	Heavy rains	One child drowned in flowing water in Bikaner.	Electric wires broken as trees uprooted in Ajmer disrupting power supply.
*	Whole year	Negligible		i) 64 persons died ii) 94 cattle perished	10,196 houses damaged

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
SIKKIM					
1.	8 & 10 Jun.	East district	Heavy rains	Due to landslides 75 persons died and 60 critically injured in Gangtok.	<ul style="list-style-type: none"> i) Atleast 10 buildings collapsed and 500 houses fully and 300 partially damaged due to landslides. ii) 10,000 families rendered homeless. iii) Relief camps set up and para-military forces employed for rescue work. iv) Loss of property estimated as Rs. 100 crores reported.
2.	11 Aug.	East district	Flash flood (Lachundehun)		<ul style="list-style-type: none"> i) In Gangtok, 1000 people affected. ii) 12 villages washed away due to sudden rise in river Lachundehun.
*	Whole year			57 persons died	3000 houses damaged
TAMIL NADU					
1.	28-31 Oct.	Chennai, Chengalpattu and Dindigul	Heavy rains		<ul style="list-style-type: none"> i) Palani – Kodaikanal road paralysed due to landslides. ii) Many roads damaged.
2.	1-8 Nov. & 15-29 Nov.	Chengalpattu, Chennai, Nagapattinam, Thanjavur and Tiruchy	Heavy rains	89 persons died.	<ul style="list-style-type: none"> i) 97 houses and many huts damaged. ii) Crops in 1,21,000 hectares of land submerged. iii) All the reserviors were overflown. iv) Several roads damaged.
3.	5-20 Dec.	Entire state	Heavy rains	177 persons died.	<ul style="list-style-type: none"> i) Nagapattinam, Thanjavur and Tiruvarur districts worst affected. ii) Reservoir at Chembarampakkam and Red-hills overflown. iii) Thousands of people in low lying areas shifted to safer places.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
TRIPURA					
1.	8 May	West Teripura	Heavy rains	One person died and 50 injured.	
UTTAR PRADESH					
1.	13 Jul.	Azamgarh, Bareilly, Faizabad, Gorakhpur, Kumaun division, Moradabad and Varanasi	Flash flood (Ganga and Ghagra)	11 persons including one child died.	
2.	Jul. (2 nd week)	Sidharthnagar	Flash floods (Rapti)	6 persons died.	
3.	21 Jul.	Ghazipur	Heavy rains	10 persons died.	500 huts affected.
4.	13 Aug.	Jaunpur	Heavy rains	4 persons including 3 children died and a child seriously injured due to house collapse.	
5.	17 Aug.	Barabanki	Heavy rains	2 children died and one woman injured due to wall collapse.	
6.	2 Sept.	Etawah	Heavy rains	4 women died and 2 persons injured due to wall collapse.	
7.	6 Sept.	Etawah	Heavy rains	3 persons died and 3 other injured due to wall collapse.	
8.	24 Nov.	Entire U.P.	Heavy rains		Potato, rice and mustard crops damaged.
9.	8 Dec.	Entire U.P.	Heavy rains		i) 80% of the potatoes and mustard destroyed. ii) Sowing operation of wheat in 45 lakh hectares delayed.
*	Whole year	0.349 million hectares		i) 102 persons died ii) 114 cattle lost	i) 1.021 million population affected ii) Crop in 0.155 million hectares damaged iii) 5,123 houses damaged

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
WEST BENGAL					
1.	28 Jun – 1 Jul	Darjeeling	Heavy rains		i) Landslides in Lodhama areas reported. ii) Several houses damaged. iii) Roads along Bengal – Sikkim border blocked. iv) Normal life paralysed.
2.	29 Jun	Medinipur	Flash flood (Kangsabati)		v) Several families rendered homeless. i) Breaches in the embankments of Kansabati river reported. ii) 500 houses washed away and more than 40,000 people rendered homeless in Tamlak and Paskura area.
3.	1 Jul	Medinipur	Flash flood (Subarnarekha)		i) 7 villages in Medinipur district affected. ii) 300 houses damaged. iii) 36,000 people were under the grip of flood water.
4.	5-8 Jul	Purulia	Heavy rains		i) 2000 people rendered homeless ii) 500 mud houses collapsed.
5.	12 Jul.	Darjeeling	Heavy rains		Normal life in Likuvi area paralysed due to landslides.
6.	14 Jul.	Murshidabad	Flash flood (Padma)		i) 12 villages in Kandi sub-division affected. ii) 25 families from Akhariganj village shifted to safer places.
7.	16 Jul.	Malda	Flash flood		Nearly 14,000 people affected.
8.	22 Jul.	Purulia	Flash flood		i) 30 villages badly affected. ii) Many mud houses collapsed.

<i>S.N.</i>	<i>Date / Period</i>	<i>Area affected</i>	<i>Intensity (River)</i>	<i>Casualties</i>	<i>Extent of damage</i>
9.	3 Aug.	North 24 Parganas	Flash flood (Ichhamati)		<ul style="list-style-type: none"> i) Breaches in the embankments of Ichhamati river reported. ii) In Hasnabad, 7 houses washed away and 15 families shifted to safer places.
10.	5 Aug.	Purulia	Heavy rains		1500 houses in 7 blocks of the district damaged.
11.	5-13 Aug.	Medinipur	Severe floods (Kangsabati & Keleghi)	10 persons died and 11 other injured.	<ul style="list-style-type: none"> i) Around 7.5 lakh people in 16 blocks affected. ii) More than 10,000 mud houses collapsed. iii) About 16,000 houses in 15 block collapsed. iv) About 90,000 people rendered homeless. v) Crops in 50,000 hectares destroyed at Ghatal. vi) Telephone exchange in Contai damaged. vii) Breaches in the embankment of Kangsabati and Keleghi rivers reported.
12.	6 Aug.	Darjeeling	Heavy rains	16 persons including 5 women and some children died and several injured.	20 houses washed away and 400 houses damaged due to landslides.
13.	10 Aug.	Darjeeling	Heavy rains	A 15-year old boy seriously injured.	<ul style="list-style-type: none"> i) Landslides reported ii) In Sonada (Siliguri), 30 houses damaged.
14.	11 Aug.	a) Howrah	Heavy rains		Thousands of people were under the grip of flood water at Dasnagar.
		b) North 24 Parganas	Heavy rains		Vast areas in Barrackpore submerged

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
15.	13 Aug.	Hooghly	Heavy rains		About one lakh people affected at Arambag due to release of water from D.V.C.
16.	18 Aug.	Medinipur	Heavy rains	One girl died due to wall collapse at Brindaban Chak village of Panskura block.	
17.	20 Aug.	a) South 24 Parganas	Flash flood (Hooghly & Sutarbag)		i) 1000 people marooned due to breach in the embankment of Sutarbag river at Dakshin Raipur, in Patharpratima area. ii) Several huts damaged in Kulpi and Raidighi areas and 3 persons swept away and 40 fishermen reported missing at Digha.
		b) Medinipur	Flash flood		i) Few hundred mud houses collapsed. ii) 20,000 people affected at Haldia.
18.	22 Aug.	a) Malda	Flash flood		About 12,000 people marooned in 7 villages of Gopalpur grampanchayat.
		b) Medinipur	Flash flood	2 persons died in Medinipur and 280 fishermen reported missing.	i) 40,000 people affected. ii) 25,000 people marooned. iii) Over 600 acres of crop land submerged in Nanigram and Mahisadal areas.
		c) South 24 Parganas	Flash flood		i) More than 5000 families evacuated to safer places in Sunderban area. ii) 64 houses collapsed in Khudirampalli area.
19.	22-28 Aug.	North 24 Parganas	Heavy rains		i) About 1000 families marooned ii) About 200 houses collapsed iii) Crops damaged.
20.	29 Aug.	Malda	Heavy rains		i) 10,000 people marooned. ii) 500 families shifted to safer places.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
21.	8 Sept.	North 24 Parganas	Heavy rains	One child aged 5 years badly injured due to house collapse at Dumdum	
22.	9 Sept.	a) Medinipur	Heavy rains		i) In Cotai, 10,000 mud houses collapsed. ii) Many people became homeless.
		b) Nadia	Flash flood		i) 40,000 people affected. ii) 10,000 people became homeless in 5 villages of Nabadwip.
*	Whole year	0.193 million hectares		38 persons died	i) 1.354 million population affected ii) Crop in 0.193 million hectares damaged iii) 40,766 houses damaged
UNION TERRITORIES					
1.	26 Jun.	Chandigarh	Heavy rains	2 women and 3 children injured due to house collapse in sector 41.	
2.	19 Jun.	Delhi	Heavy rains	2 persons died and one child injured in house collapse.	
3.	13 Jul.	Delhi	Heavy rains		Railway services disrupted.

TABLE – XII : CYCLONIC STORM

During 1997, 3 cyclonic storms formed in the Bay of Bengal, however, none crossed the Indian coast.

* Information received from Central Water Commission