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## भारत सरकार GOVERNMENT OF INDIA

# भारत मौसम विज्ञान विभाग INDIA METEOROLOGICAL DEPARTMENT

# DISASTROUS WEATHER EVENTS 1998

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# DISASTROUS WEATHER EVENTS 1998

#### **Cover Photo**

Damage to Microwave Tower at Porbandar due to Cyclone which crossed the Gujarat coast near Porbandar on 9 June 1998

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#### **DISASTROUS WEATHER EVENTS OF 1998**

#### The most striking disastrous weather events of 1998 were the following:

- (i) A very severe cyclonic storm occurred in Arabian Sea during 4-10 June and took a toll of 1,173 people in Gujarat and another 1,774 people were reported missing and feared to have been washed away. More than 2.5 lakh houses destroyed or damaged. Loss of property worth Rs. 190 crores, reported.
- (ii) Severe floods and heavy rains occurred over many parts of the country and claimed over more than 2800 human lives. Crop in several lakh hectares of land lost.
- (iii) Severe heat wave conditions prevailed over Orissa, Bihar and many parts of the country during April to June in which more than 1,700 human lives were 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 conditions are depicted seasonwise on four maps.

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S.No.	Date / Period	Area affected	Intensity	Casualty		Extent of damage
				TABLE - I : SNOWFALL		
				CRITERIA		
			M	oderate : 7.6 to 34.9 cm in 24 hrs.		
				Heavy : ≥ 35.0 cm in 24 hrs.		
1.	24 Feb.	Chamba, Kinnaur and Lahaul and Spiti	Heavy		i) ii)	Normal life in entire tribal belt thrown out of gear. 300 km stretch of Jammu-Srinagar National Highway closed due to 2-3 feet of snow
2.	25 Feb.	Kinnaur and Kullu	Heavy	2 women died in house collapse following landslides in Kullu district.	i) ii)	Normal life paralysed.  Extensive damage to crops at Kinnaur.
3.	27 Feb.	Doda	Heavy	11 persons died under a huge iceberg.		
4.	5 Mar.	Himachal Pradesh (Entire State)	Heavy	16 persons died.		
5.	31 Mar.	North Sikkim	Heavy (Avalanche)	11 army persons died and 5 other injured in Thhangu.		
6.	22 Oct.	Chamoli	Heavy	4 Kedarnath bound pilrims died.		

S.No.	Date /	Area affected	Intensity	Casualty	 Extent of damage	
	Period					

#### TABLE - II: COLD WAVE

#### CRITERIA

(A) Where; Normal minimum temperature is 10°C or more.
Moderate cold wave: Night temperature 5° C 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°C to 4°C below normal.
Severe cold wave: Night temperature 5°C or more below normal

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ed in Jaipur district.
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S.No.	Date / Period	Area affected	Intensity	Casualty	Extent	of damage
7.	25 Dec.	Punjab (Entire State)	Cold wave (B)	2 persons died.		
	27 Dec.	(a) Bareilly, Lucknow and Sultanpur	Cold wave (B)	5 persons died.		
		(b) Ajmer, Alwar, Bharatpur, Bikaner, Churu, Dholpur,	Moderate to Severe cold wave	2 persons died.		
		Dungarpur, Ganganagar, Hanumangarh, Jaipur, Jhunjhunu, Jodhpur, Nagaur, Pali, Sikar and Sirohi	(Both A and B as appropriate)			
	27-31 Dec.	Bihar (Entire State)	Severe cold wave (Both A and B as appropriate)	50 persons died.		
10. 2	29 <b>Dec.</b>	Allahabad, Gorakhpur and Lucknow	Severe cold wave (Both A and B as appropriate)	20 persons died.		
	•					

S.No.	Date /	Area affected	Intensity	Casualty	Extent of damage
	Period		-	•	•
					<del>"</del>

#### TABLE - III : HEAT WAVE

#### **CRITERIA**

(A) Where; Normal maximum temperature is 40°C or less.
Moderate heat wave: Day temperature 5° C 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°C to 4°C above normal.
Severe heat wave: Day temperature 5°C or more above normal.

1.	2 Apr.	Hyderabad	Severe heat wave (A)	One person died.
2.	6 Apr.	Kurnool	Severe heat wave (A)	One person died.
3.	7 Ap <u>r</u> .	Buldhana	Moderate heat wave (A)	One person died at Khamgaon.
4.	21-26 Apr.	Hyderabad, Kurnool and Medak	Severe heat wave (A)	5 persons died.
5.	May	(a) Bihar (Entire State)	Severe heat wave (Both A and B as appropriate)	91 persons died.
		(b) Madhya Pradesh (Entire State)	Severe heat wave (Both A and B as appropriate)	25 persons died.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
		(c) East Godavari, West Godavari, Khammam, Krishna, Srikakulam and	Severe heat wave (Both A and B as	355 persons died.	
6.	7 May	Visakhapatnam Jalgaon	appropriate Severe heat wave (B)	3 persons died.	
7.	8 May	Amravati	Heat wave (B)	2 persons died.	
8.	May (3 <sup>rd</sup> and 4 <sup>th</sup> week)	Ajmer, Alwar, Bhilwara, Bundi, Dausa, Jaipur, Jalore, Jodhpur, Kota, Pali, Rajsamand, Sawai	Severe heat wave (B)	211 persons died.	
		Madhopur, Sikar, Tonk and Udaipur		:	
9.	19 May	Dhule, Jalgaon and Nashik	Severe heat wave (Both A and B as appropriate)	4 persons died.	
10.	20-30 May	Orissa (Entire State)	Severe heat wave (Both A and B as appropriate)	340 persons died.	
11.	21 May	Uttar Dinajpur	Severe heat wave (A)	3 persons died at Raigunj.	
12.	May (4 <sup>th</sup> week)	(a) Gujarat (Entire State)	Severe heat wave (Both A and B as	12 persons died.	
		(b) Vidarbha region	appropriate) Severe heat wave (B)	Many persons died.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
13.	26 May	Uttar Pradesh (Entire State)	Severe heat wave (Both A and B as appropriate)	33 persons died.	
14.	26-29 May	<ul><li>(a) Haryana &amp; Punjab</li><li>(Entire States) and</li><li>Chandigarh (U.T.)</li><li>(b) Chennai and Madurai</li></ul>	Severe heat wave (Both A and B as appropriate) Moderate	36 persons died. 2 persons died.	
15.	27-29 May	Bolangir, Jharsuguda and Sambalpur	heat wave (A) Severe heat wave (B)	36 persons died.	
16.	Jun.	East Godavari, Guntur, Karimnagar, Krishna, Kurnool, Nellore, Srikakulam, Visakhapatnam and West Godavari	Severe heat wave (A)	159 persons died; maximum deaths reported in East Godavari district.	
17.	1-4 Jun.	(a) Bardhaman, Hooghly, North 24 Parganas and Purulia	Severe heat wave (A)	16 persons died.	
		(b) Uttar Pradesh (Entire State)	Severe heat wave (Both A and B as appropriate)	96 persons died.	
18. 19.	3 Jun. 4-8 Jun.	Kota East Singhbhum, Jahanabad, Jamui and Patna	Heat wave (B) Severe heat wave (A)	3 persons died. 111 persons died.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
20.	5 Jun.	(a) Chandrapur	Moderate heat wave (A)	One person died.	
		(b) Medinipur	Moderate heat wave (A)	4 persons died.	
21.	7 Jun.	Murshidabad	Severe heat wave (A)	4 persons died.	
22.	9 Jun.	Khurda	Severe heat wave (A)	50 persons hospitalized.	
23.	9-11 Jun.	Bardhaman, Calcutta, Nadia, North 24 Parganas and Purulia	Severe heat wave (A)	28 persons died.	
24.	9-12 Jun.	Begusarai, Buxar, Gaya and Patna	Severe heat wave (B)	70 persons died.	
25.	12 Jun.	Nawada	Moderate heat wave (A)	2 persons died.	
26.	17 Jun.	Lakhisarai	Moderate heat wave (A)	2 persons died.	
27.	22 Jun.	Alwar, Dausa and Jhunjhunu	Heat wave (B)	5 persons died.	

TABLE-IV: DROUGHT

NIL

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
				TABLE - V : SQUALL	
			A sudden increa rising to 40 kr	ase of wind speed by at least 29 kmph (1 nph (22 kts) or more and lasting for at le	16 kts), the speed east one minute
				CRITERIA	
			Modera Seve	te : Surface wind speed (in gusts) upto 8 re : Surface wind speed (in gusts) > 80	30 kmph. kmph.
l <b>.</b>	29 Mar.	Medinipur	Severe	9 persons injured due to roof	Many trees uprooted.
)	17 Apr.	Kamrup	Severe	collapse in Danton and Egra.	i) 98 Bihu Pandals and many houses damaged.
}	4 May	Patna	Moderate		ii) Power supply disrupted. Telephone services disrupted.
ł.	27 May	Khandwa	Severe	7 persons injured at Gulshannagar.	13 houses collapsed.
5.	13 Jun.	Bhagalpur	Moderate	3 children died as roof fell upon them at Sultanganj.	
8.	15 Jun.	Hooghly	Moderate	One person died under an uprooted Mango tree.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
7. 8	22 Jun. 9 Jul.	Koraput Dakshina Kannada	Moderate Moderate	2 persons died at Malkangiri.	Many arecanut trees fell at Puttur, loss worth Rs. 20 lakhs reported.
				TABLE - VI : GALE	
				CRITERIA	
	•			Strong : Wind speed ≥ 75 kmph	
1.	4 Jan.	Thiruvananthapuram	Strong		i) Thousands of rubber and other trees uprooted in Vithura and Peringammala areas.
2.	5 Mar.	Nashik	Strong		<ul><li>ii) 10 houses completely and 30 partially damaged.</li><li>i) Onion crop damaged.</li><li>ii) Telecom system affected.</li></ul>
3.	7 Apr.	Adilabad	Strong		i) Mango and Tamarind fruits destroyed.  ii) Several houses damaged.
4.	9 Apr.	Assam (Many parts of the State)	Severe	12 persons died.	i) Thousands of people in 107 villages affected.  ii) Telephone lines/electric poles uprooted disrupting telecommunication and power supply.
5.	15 May	Mumbai City	Strong		15 trees uprooted.
6.	22 Jun.	Dharwad	Strong		20 houses fully and 20 other partially damaged in Udupi.
7.	9,17,19 Jul.	Idukki, Kottayam and Thiruvananthapuram	Strong		Several houses damaged
8.	30 Sep.	Jaipur and Sawai Madhopur	Strong	2 persons died.	<ul><li>i) Several houses damaged.</li><li>ii) Many electric poles uprooted.</li></ul>

S.No.	Date /	Area affected	Intensity	Casualty	Extent of damage
	Period				

#### TABLE - VII: DUSTSTORM

#### CRITERIA

Moderate : Wind speed between 39 to 74 kmph and horizontal visibility upto 500 metres. Severe : Wind speed ≽75 kmph and horizontal visibility upto 50 metres.

NIL

#### TABLE - VIII: LIGHTNING

1. 2.	4 Feb. 25 Feb.	Bardhaman Bardhaman	2 persons died. One person died and 2 other seriously injured.	
3.	13 Mar.	Thiruvananthapuram	One person died.	
4.	18 & 19	Akola, Amravati and	i) 11 women died.	Loss to property and crops reported.
	Mar.	Yavatmal	<li>ii) A few animals perished.</li>	
5.	20 Mar.	Betul, Raisen and Vidisha	3 persons died.	
6.	22 Mar.	Yavatmal	3 persons died.	
7.	23 Mar.	(a) Hooghly	3 persons, including one woman,	
			died .	
		(b) Nawada	3 persons died.	
8.	24 Mar.	South 24 Parganas	2 persons died at Bederhat and	
			Tona villages.	

S.No.	Date / Period	Area affected	Intensity	Casualty	
9.	29 Mar.	Darbhanga		One person died and 4 other	
				injured at Bhantabari.	
10.	30 Mar.	(a) Darbhanga	•	One person died and 2 injured at	
			•	Hanumannagar.	
		(b) ldukki		3 persons died.	
11.	31 Mar.	Lakhisarai		One person died at Gulani	
				village.	
12.	4 Apr.	Darbhanga		One person and a horse died at	
	•	•		Belaunja.	
13.	13 Apr.	Kottayam		2 persons died.	
14.	22 Apr.	(a) Bhandara		One person died at Lonara.	
	•	(b) Hyderabad		2 persons died and 5 injured in	
		,		Hayatnagar area.	
15.	24 Apr.	ldukki		One person died.	•
16.	26 Apr.	Gadchiroli		One person died and many	
	•		•	injured at Panjari.	
17.	27 Apr.	Ajmer		8 persons died and 4 other	
	•			injured.	
18.	1 May	Purulia		2 women died at Gara-Phursa	
				village.	
19.	3 May	(a) Nadia		One person died at Kulgachi.	
	,, ,	(b) South 24 Parganas		2 persons died and 6 other	
		(2)		injured in Homra village.	
20.	8,10	Kozhikode and		3 persons died and 4 injured.	
-0.	May	Thiruvananthapuram	,		
21.	9 May	(a) Alwar		One person died.	
A 1 1	o may	(b) Wardha		One person died at	
		(b) Warana		Dhamangaon.	
22.	12 May	Chandrapur		7 persons died in Gondpipri	
·	i L May	·		village.	
23.	13 May	Bhadrak		One person seriously injured.	16 houses burnt.
20.	10 IVIUY	Diadian		One percent conteacty injured.	

Extent of damage

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
24.	15 May	Nagpur		2 persons died at Savargaon.	
25.	21 May	Nadia		2 persons and 2 children died and one man injured.	
26.	24 May	Vellore		3 persons died.	•
27.	26 May	(a) North 24 Parganas		2 women died at Patulia village and 3 persons injured at Barunhati	
		(b) South 24 Parganas		One woman died at Shapure.	
28.	30 May	Jamui		3 boys playing cricket died at Jhajha.	
29.	1 Jun.	Idukki, Kannur and Kottayam		3 persons died and 7 injured.	
30.	2 Jun.	Chitradurga and Dharwad		5 persons died.	
31.	4 Jun.	Jamui		3 children died and 4 injured in Makrand village.	
32.	11 Jun.	Bhandara		One woman died at Lakhandur.	
33.	12 Jun.	Medinipur		4 persons died.	
34.	14 Jun.	Nagpur		One person died in Nagpur city.	
35.	16 Jun.	Medinipur		One school teacher died.	
36.	17 Jun.	Nagpur		One person died and another injured at Gondkhire.	
37.	28 Jun.	Yavatmal		One person died at Kallamb.	
38.	1 Jul.	Buxar		One person died and other injured at Patalpuri.	
39.	12 Jul.	Bokaro		4 persons died and one injured.	
40.	14 Jul.	Medinipur		2 persons died.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
41.	15 Jul.	Howrah		8 persons died.	
42.	23 Jul.	Birbhum		3 persons died.	Telecom services badly affected.
43.	24 Jul.	Purulia		3 persons died.	•
44.	25 Jul.	Bardhaman		2 persons died.	
45.	26 Jul.	Nagpur		3 persons died.	
46.	28 Jul.	Nagpur		One person died and 2 injured.	
47.	31Jul.	(a) Balasore		2 persons died at Jaleswar	
		(b) Kota		One person died at Ramganj Mandi.	
48.	2 Aug.	(a) Gulbarga		2 women died and 2 teenage girls injured in paddy field at Karur.	
		(b) Jamui		4 persons died.	
49.	3 Aug.	Nawada		5 persons died.	
50.	9 Aug.	East Singhbhum		2 persons died at Bargidih village.	
51.	13 Aug.	Bhojpur		One child died and 4 persons injured at Arrah.	•
52.	17 Aug.	Bhagalpur		4 persons died at Kahalgaon.	
53.	19 Aug.	Bokaro		One woman died and another injured.	
54.	20 Aug.	Begusarai		2 persons died and 2 children injured at Shokahara village.	
55.	21 Aug.	Nagpur		One person died at Beltur.	
56.	23 Aug.	(a) Kishanganj		One person died and another injured.	
		(b) Madhepura		One person died.	
		(c) Nagpur		3 persons died at Saoner.	
57.	24 Aug.	Begusarai		2 persons died and 3 other injured at Brauni.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
58.	26 Aug.	Dhanbad and Nawada		7 persons died and 5 girls injured.	
59.	29 Aug.	(a) Cuttack		2 persons and 2 girls died.	
		(b) Nagpur		2 women died at Pachgaon.	
60.	31 Aug.	Nawada		3 women died.	
61.	6 Sep.	(a) Bankura		5 persons died and one injured.	
		(b) Bhubaneshwar		One person died.	
62.	12 Sep.	Buldhana		4 persons died at Malkapur.	
63.	14 Sep.	Alwar		One person died.	
64.	16 Sep.	Alwar		2 women burnt seriously.	
65.	19 Sep.	Bidar		3 persons died at Lalgopura.	
66.	22 Sep.	Wardha		2 persons died at Hinganghat.	
67.	23 Sep.	(a) Kota		One woman died.	
	•	(b) Khurda		One person died.	
68.	24 Sep.	(a) Thrissur		One person died and another injured.	
		(b) Rohtas		6 family members injured at Sasaram.	
69.	25 Sep.	(a) Gulbarga		One person died at Neelakunda village.	
		(b) Dausa		· ·	Clothes worth lakhs of rupees burnt.
70.	26 Sep.	(a) Bijapur, Gulbarga and		i) 2 persons died and one	•
	·	Raichur		woman injured. ii) 13 sheep perished.	
		(b) Raigarh		One person died and another injured	
		(c) Chittorgarh		One person died.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
71.	27 Sep.	Mumbai City		2 persons died and one injured.	
72.	28 Sep.	Bikaner		One person died.	
73.	30 Sep.	Hazaribagh		3 women, 2 girls and one child of a family died and another 4 injured.	
74.	2 Oct.	Bijapur		4 persons died.	
75.	3 Oct.	Nashik and Osmanabad		4 persons died and one injured seriously.	
76.	4 Oct.	Gulbarga		One person died.	
77.	5 Oct.	(a) Solapur (b) Gulbarga		4 persons died. One person died at Udagi.	
78.	7 Oct.	(a) Bangalore (b) Giridih		One boy died at Gunigerahalli. i) One girl died. ii) 2 animals injured.	
79.	8 Oct.	Gulbarga		One woman and her son died.	
80.	11 Oct.	Hazaribagh		3 family members died at Shanei village.	
81.	18 Oct.	Buxar		One person died at Nimij village.	
82.	8 Nov.	Lakhimpur Kheri and Lucknow		2 persons died at Sampoornanagar.	
83.	9 Nov.	Ratnagiri		One person died and 2 other injured.	
84.	28 Nov.	Alappuzha		One student died.	

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
				TABLE -IX: THUNDERSTORM	
				CRITERIA	
				: Loud peals of thunder with frequent lig oderate to heavy rains and maximum wi	
				ntinuous thunder and lightning, heavy raximum wind speed ≽ 75 kmph.	ns and
1.	4 Feb.	Bardhaman	Moderate	One person died due to wall collapse at Gopalpur.	
2.	5 Mar.	Nashik	Moderate	oonapos at dopalpan.	i) Onion crop damaged.
3.	11 Mar.	Howrah	Severe	One woman died and a few persons injured at Uliberia.	ii) Telecommunication services disrupted.
4. 5.	15 Mar. 23, 24 Mar.	Punjab (Entire State) (a) Bankura	Moderate Moderate	· · · · · · · · · · · · · · · · · · ·	Standing crop badly damaged. 30 houses at Zinkara village damaged making 400 families shelterless.
		(b) Nadia	Moderate	12 persons injured.	<ul> <li>i) Dhantalya, Dhubulia, Krishnagar, Nabadwip and Shantipur villages affected.</li> <li>ii) 300 mud houses collapsed.</li> <li>iii) Many people rendered homeless.</li> </ul>
		(c) North 24 Parganas	Moderate		At Kancharapara under Barrackpore subdivision, i) Many trees uprooted. ii) Normal life affected.
		(d) South 24 Parganas	Severe		In Patherpratima, Kultali, Mathurapur, Raidighi and Gosaba areas, i) Many mud houses collapsed. ii) Electric lines cut off. iii) Extensive damage to crops reported.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
6.	24 Mar.	(a) Balasore	Severe ( <b>Tornado)</b>	25 people including 16 school children died and more than 200 injured.	<ul> <li>i) A local severe storm (Tornado) lashed 3 villages under Jaleswar block about 50 km. from Balasore.</li> <li>ii) A primary school building in Gobaraghata village razed to ground.</li> <li>iii) Many houses collapsed, trees and electric poles uprooted disrupting power supply.</li> <li>iv) Telecommunication links cut off in 3 villages under Jaleswar block.</li> <li>v) Odisha Trunk road blocked disrupting road communication to Jaleswar.</li> </ul>
		(b) Medinipur	Severe ( <b>Tornado</b> )	48 people died and about 1100 injured.	i) 30,000 people affected and 8000 became homeless. ii) 2758 houses fully and 2944 partially damaged.
7.	29 Mar.	(a) Idukki	Severe	nijureu.	Extensive damage to agriculture at Adimeli and Thodupuzha reported.
		(b) Medinipur	Severe	9 persons injured at Mohanpur due to roof collapse.	Many trees uprooted.
8.	4 Apr.	Purulia	Moderate	and to rook osmapoor :	<ul><li>i) Several houses damaged at Barabazar and Manbazar.</li><li>ii) Electric and telephone lines snapped.</li></ul>
9.	6 Apr.	ldukki	Severe		Extensive damage to agriculture at Vannapuram Panchyat reported.
10.	8 Apr.	Jalpaiguri	Severe	3 persons died and 10 injured.	4000 people affected and many became homeless in 7 blocks of the district.
11.	23 Apr.	(a) Ananthapur	Severe	One person died due to wall collapse and 2 other electrocuted.	
		(b) Cuddapah	Severe		Widespread devastation reported in Kondapuram mandal of the district.
12.	25 Apr.	Chamba	Moderate		In some villages, dozens of houses razed to the ground and hundreds of roofs blown off.
13.	26 Apr.	Shekhpura	Moderate		Extensive damage to standing crop and grain lying in the field reported.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
14.	28 Apr.	(a) Barabanki, Lucknow and Moradabad	Moderate		Wheat, tur, masur and mustard crops badly damaged.
		(b) Hooghly	Moderate	5 persons injured at Khamergachi.	50 houses damaged.
		(c) Medinipur	Moderate	One person died in a wall collapse at Kornet Gola.	
15.	7 May	Bihar (Many parts of the State)	Severe	6 persons died.	
16.	9 May	Thiruvananthapuram	Severe		Widespread damage to agriculture reported.
17.	14 May	ldukki	Severe		Extensive damage to rubber plantations reported.
18.	27 May	East Nimar	Moderate	7 persons injured in house collapse at Khandwa.	, , , , , , , , , , , , , , , , , , ,
19.	30 May	(a) Begusarai	Severe	3 boys died at Makrand.	
	•	(b) Birbhum	Severe	10 persons injured at Saithia.	500 houses collapsed.
20.	12 Jun.	Ìdukki	Severe	,	15 houses and rubber plantations damaged.
21.	15 Jun.	Hooghly	Severe	One person died under an uprooted mango tree at Bhadreswar.	Train services between Howrah-Bardhaman disrupted due to snapping of electricity lines.
22.	14 Jul.	Cuttack	Severe	One person died and another injured at Vanpur.	
23.	17 Sep.	Uttar Dinajpur	Severe (Tornado)	2 persons badly injured.	89 houses destroyed.
24.	3 Oct.	Jhunjhunu	Severe	<ul><li>i) One person electrocuted.</li><li>ii) Many birds and animals perished.</li></ul>	Several houses collapsed.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
				TABLE - X: HAILSTORM	
				CRITERIA	
		/	Mode	Sparse, usually small size and often mix rate: Fall abundant enough to whiten gr: Includes at least a proportion of larges	round.
1.	3 Feb.	Lakhimpur	Moderate		In Dhaka Khuna area, i) Standing rabi crop badly damaged. ii) Power supply disrupted. iii) Several trees uprooted and a few houses damaged.
2.	4 Feb.	Calcutta	Moderate Moderate		Many books at the Book-fair drenched.  Many trees uprooted and crops badly damaged in Bhiwapur.
3. 4.	7 Feb. 25 Feb.	Nagpur Begusarai, Muzaffarpur, Patna and Vaishali	Heavy	10 persons died.	Widespread damage to wheat crop reported.
5.	6 Mar.	(a) Howrah	Moderate	4 persons injured.	<ul> <li>i) 1,500 mud houses damaged, 3000 people became homeless.</li> <li>ii) Large size hails reported from Ghoraberia, Hatgachia, Kashnali, Kharigeria, Kulia, Nignan.</li> </ul>
6.	15, 16 and 18	(b) Uttar Dinajpur Vidarbha region	Moderate Heavy	Many people injured at Dhamangaon in Wardha district	Moderate damage to crops reported.  Wheat, jowar, gram, tur, cotton and chilly crops; orange and banana orchards destroyed.

and 18 Mar.

Many people injured at Dhamangaon in Wardha district on 16<sup>th</sup>.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
7.	16 Mar.	(a) Haryana (Entire State) (b) Dausa, Jaipur, Sawai Madhopur and Tonk	Moderate Heavy	One person died.	Rabi crop badly damaged. Wheat crop badly damaged.
8.	18 Mar.	(a) Bhopal (b) Latur and Parbhani (c) Nanded	Moderate Heavy Heavy	Many people injured. 7 persons died. 2 persons died.	Moderate damage to crops reported.  Extensive damage to crops reported.
9.	22 Mar.	Dholpur and Jaipur	Heavy	<ul> <li>i) 2 persons died and many other injured when a tree fell at Dholpur.</li> <li>ii) Flocks of birds and animals perished.</li> </ul>	<ul><li>ii) Hundreds of trees and electric poles uprooted.</li><li>iii) Power supply disrupted and telephone lines snapped.</li></ul>
10.	23 Mar.	(a) Cachar and Goalpara	Moderate	portanea.	iv) Several houses damaged. In Lakhipur, i) Rabi crop damaged. ii) A few houses collapsed
		(b) Bolangir (c) Vidarbha region	Moderate Heavy	<ul><li>2 persons injured.</li><li>i) 4 persons died and 105 injured.</li><li>ii) About 2000 cattleheads</li></ul>	Rabi crop damaged in Titlagarh.  i) Hails of the size of lemon destroyed wheat, gram, cotton, tur, groundnut, chilly crops and grape, banana and orange orchards.
11.	23, 24 Mar.	Medinipur	Heavy	perished.	<ul> <li>ii) Trees, poles uprooted and cables snapped off.</li> <li>i) Many villages affected.</li> <li>ii) 200 mud houses damaged in Nandigram, Haldia and</li> </ul>
12. 13.	31 Mar. 8 Apr.	Bhagalpur Some parts of Punjab State	Heavy Moderate	4 persons died in Kahalgaon.	Tamluk areas.  Wheat crop extensively damaged.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
14.	9 Apr.	(a) Parts of Haryana, Himachal Pradesh and Punjab States and Chandigarh (U.T.)	Heavy		<ul> <li>i) Standing crops badly damaged.</li> <li>ii) TV antennas and trees uprooted.</li> <li>iii) Vehicular traffic at some places in Himalchal Pradesh remained suspended due to landslide.</li> </ul>
		(b) Lakhisarai	Heavy	2 persons died and many injured.	<ul> <li>i) Rabi crops damaged.</li> <li>ii) Approx. 100 houses damaged.</li> <li>iii) Electric/telecom services affected.</li> </ul>
		(c) Bhandara	Moderate		Loss of property reported from Lakhani.
		(d) Darrang, Dhemaji, Dhubri, Dibrugarh, Golaghat, Lakhimpur, Sonitpur and Tinsukia	Heavy	12 persons died and a hundred injured.	<ul> <li>i) Power and telecom systems disrupted due to uprooting of trees and electric poles.</li> <li>ii) Hundreds of houses damaged.</li> <li>iii) Extensive damage to crops reported.</li> </ul>
15.	10 Apr.	Imphal and Thoubal	Heavy	One person died and many injured.	Standing crops and many houses damaged, trees uprooted.
16.	11 Apr.	Medinipur	Heavy	One person died and 50 injured in 3 villages of Sabong area.	<ul><li>i) Standing crop badly damaged.</li><li>ii) 350 huts damaged.</li></ul>
17.	25 Apr.	Solan	Moderate	3	Moderate damage to crops reported.
18.	29 Apr.	(a) Cuddapah, Kurnool and Nalgonda	Heavy	10 persons died.	
		(b) Gulbarga	Heavy	<ul><li>i) 4 persons died.</li><li>ii) 300 cattle perished.</li></ul>	
19.	4 May	Jamui	Heavy	12 persons injured at Chakai Parkhad.	
20.	7 May	Aurangabad (Bihar)	Heavy	3 persons died at Basbigha.	
21.	9 May	Shimla	Heavy		Wheat and fruit crops badly damaged.

S.No.	Date / Period	Area affected	Intensity	Casualty	Extent of damage
22.	15 May	Dakshin Dinajpur	Heavy		In Balurghat, i) Paddy fields damaged. ii) Roof tops blown off.
23.	18 May	(a) Shimla and surrounding areas	Moderate		Wheat and fruit crops damaged.
		(b) Koraput	Heavy	One person died and 57 injured in Jeypore.	Loss of property reported.
24.	14 Jun.	Bhagalpur	Moderate	3 persons died in Akbarnagar.	
25.	9, 11 Sep.	Vidarbha region	Moderate		Widespread damage to crops reported.
26.	12 Sep.	Kurukshetra and Sirsa	Moderate		Moderate damage to crops reported.

S.N.	Date /	Area affected	Intensity	Casualties	Extent of damage
	Period		(River)		

#### TABLE – XI : FLOODS AND HEAVY RAINS

### STATES

#### **ANDHRA PRADESH**

1.	20-28 Sept.	Cuddapah, Guntur, Kurnool and West Godavari	Moderate flood (Tungabhadra)	51 persons died.	Damage to property and agriculture reported.
2.	Oct. (2 <sup>nd</sup> week)	Entire State	Severe flood	179 persons died.	Damage to property and agriculture reported.
3.	28 Óct. - 4 Nov.	Entire State	Heavy rains	17 persons died.	Damage to property and agriculture reported.
4.	11-16 Dec.	Entire State	Heavy rains	16 persons died.	Damage to property and agriculture reported.
*	Whole year	1.675 m.ha.		i) 279 persons died. ii) 155 cattle perished	<ul><li>i) 0.568 million people affected.</li><li>ii) Crop in 1.675 m. ha affected</li><li>iii) 1,63,739 houses damaged.</li></ul>
		ARUNACHAL PRADESH		• .	
1.	17 Jun.	Some parts of the State	Heavy rains	<ul><li>i) 23 persons died due to landslide.</li><li>ii) 16 animals lost.</li></ul>	Affected areas cut-off from rest of the country due to landslides and damaging of bridges.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
		ASSAM			
1.	24 & 25 May	Dhemaji	Severe flood (Gai and Jaudgal)		In Jaidhal, Machkhowa, Moridhal, Shripani and Siriborgaon areas i) 200 villages inundated. ii) Railway bridge over river Gai and several kilometers of National Highway No. 52 damaged. iii) Rail services between Junai-Sitapathi disrupted.
2.	3 Jun.	Cachar, Dhemaji, Dibrugarh, Lakhimpur and Tinsukia	Heavy rains	51 persons died of which 7 due to landslide and 158 injured.	<ul><li>iv) Ahu and other crops damaged.</li><li>i) Torrential rain caused worst landslides.</li><li>ii) Dhemaji cut off from other parts of the country.</li></ul>
3.	10-16 Jun	11 districts of upper and lower Assam including Cachar, Darrang, Dhemaji, Dibrugarh, Jorhat, Lakhimpur, Sonitpur and Tinsukia	Severe flood (Brahmaputra and its tributaries)	<ul> <li>i) 105 persons died, of which a few died in a landslide due to torrential rain.</li> <li>ii) Several animals in Kaziranga National Park washed away.</li> <li>iii) 7184 animals lost.</li> </ul>	<ul> <li>i) More than 4 lakh people affected</li> <li>ii) Breach in embankment at Sonapur inundated 50 villages.</li> <li>iii) National Highway No. 31 submerged.</li> <li>iv) Road/rail communications disrupted.</li> <li>v) Crops on 34,100 hectares damaged.</li> <li>vi) Landslides reported.</li> </ul>
4.	19 Jun	Dhemaji	Heavy rains	iii) 7104 atiintais iost.	<ul> <li>i) Area under Siriborgaon revenue circle submerged, damaging crops in thousands of acres.</li> <li>ii) National Highway No. 52 damaged.</li> </ul>
5.	21-24 Jun	Barpeta, Dar ang, Jorhat, Nalbari and Sibsagar	Severe flood (Brahmaputra and its tributaries)	3 persons died.	<ul> <li>i) Railway track near Samaranjan washed away. Badarpur-Lumding railway line disrupted.</li> <li>ii) National Highway No. 52 damaged cutting off road communication between Dhemaji and Lakhimpur.</li> <li>iii) Embankment of Dakgaon breached flooding 10 villages and affecting 10,000 people.</li> <li>iv) Ahu and Aijung fields in vast areas destroyed.</li> </ul>

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
6.	26-29 Jun	Dhemaji and Lakhimpur	Moderate flood (Subansiri)		<ul> <li>i) Paddy fields in 60 villages affected.</li> <li>ii) 45,000 people became homeless.</li> <li>iii) National Highway No. 52 submerged.</li> <li>iv) Road, Rail and Telecommunication disrupted.</li> </ul>
7.	30 Jun	Lakhimpur	Flash flood (Subansiri)		Many people near the river affected.
8.	Jul.	Entire State	Severe flood (Brahmaputra and its tributaries)	<ul> <li>i) 81 persons died.</li> <li>ii) 2 elephants, 3 deer and one royal bengal tiger in Kaziranga National Park perished.</li> </ul>	n ii) Entire NE region cut-off from rest of the country.
9.	1-10 Aug.	Barpeta, Cachar, Dhemaji, Dhubri, Jorhat and Nalbari	Severe flood (Brahmaputra and its tributaries)	93 persons died due to floods and landslides.	,
10.	17-20 Aug.	Barpeta, Dhemaji, Lakhimpur, Morigaon, Nalbari and Sonitpur	Moderate flood		<ul> <li>i) National Highway No. 21 flooded.</li> <li>ii) Tezpur central university closed.</li> <li>iii) State cut off from rest of the country due to landslide.</li> <li>iv) 4 lakh people affected.</li> </ul>
11	23 Aug.	Goalpara	Flash flood (Doyang)		<ul> <li>i) Doyang Hydro Electric Project flooded.</li> <li>ii) Landslides reported.</li> <li>iii) 3 lakh people affected.</li> </ul>

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage	,
12.	26 Aug.	Bongaigaon and Dhemaji	Flash flood (Brahmaputra and its tributaries)	15 persons drowned in a boat accident.	Large number of population affected. Flood situation remained grim.	
13.	31 Aug.	Dibrugarh	Flash flood		8 villages severely hit due to embankments	breaches in
					15 houses washed away.	
14.	1-11 Sept.	Entire State	Severe flood (Brahmaputra	i) 78 people died due to flood and 51 due to landslides.	National Highway Nos. 31, 37, 51a cutting off road communication.	and 52 flooded,
			and its	ii) 5 deer died.	Many school buildings completely wash	ned away.
			tributaries)		50 lakh population affected.	
					2.47 lakh hectares of crop-land affected	<b>i</b> .
15.	14 & 15	Darrana and Calaghat	Moderate flood	One nersen died at Mangaldai	23,000 houses damaged.	
15.	Sept.	Darrang and Golaghat	Moderate 11000	One person died at Mangaldoi.	Low lying areas submerged. Telephone poles uprooted.	
*	Whole	1.324 m. ha.		i) 427 people died.	6.957 million people affected.	
	year	1102 / 1111 1101		ii) 86,224 cattle heads lost.	Crop in 0.478 m. ha. affected.	
	<b>,</b>			.,	2,20,436 houses damaged.	
		BIHAR				
1.	18 Jul.	Patna and Vaishali	Heavy rains	One woman and a child died due to house collapse in Mile village.		
2.	1-12	22 districts	Severe flood	105 persons died.	Over 7 million people affected.	
	Aug.		(Adhwara, Bagmati, Khirai and Kamla Balan)		Extensive damage to crops reported.	

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
3.	26 Aug. – 9 Sept.	28 districts	Severe flood (Ganga,	181 persons died due to flood and landslide.	i) 7600 villages affected and thousands of people became homeless.
	÷		Gandak, Kosi, Kamla Balan and Bagmati)		ii) Extensive damage of crops and property reported.
*	Whole	2.512 m. ha.	3 ,	i) 381 people died.	i) 13.470 million people affected.
	year			ii) 187 cattle lost.	ii) Crop in 1.284 m. ha. affected. iii) 1,99,611 houses damaged.
		GUJARAT			
1.	5-8 Jul.	Amreli, Banaskantha,	Severe flood	14 persons died.	i) 7000 people evacuated to relief camps.
		Bharuch, Jamnagar,	(Purna,		ii) Big wall of Porbandar port washed away.
		Junagadh, Surat, Surendranagar and	Damanganga and Dhandhar)		iii) Several villages submerged.
		Valsad	and Dhandhai)		iv) Several roads in the interior rural areas washed away.
2.	Sept. (3 <sup>rd</sup>	Ahmadabad and Surat	Severe flood	i) 24 persons died.	i) 1.5 lakh people evacuated.
2	week)	Count	(Tapi)	ii) 2900 cattle lost.	ii) Life thrown out of gear in Surat.
3. *	3 Oct. Whole	Surat	Heavy rains	2 persons died.	1) 0 500 × W
	vear	-		i) 153 persons died. ii) 4668 cattle lost.	i) 3.532 million people affected. ii) 23,227 houses damaged.
				11) 4000 Gaille 1051.	ii) 25,227 nouses damaged.
		HARYANA			
1.	12 Sept.	Kurukshetra	Heavy rains		Heavy loss to crops reported.
	The grades			•	

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
2.	2 Oct.	Rohtak	Heavy rains		<ul><li>i) 36 villages flooded.</li><li>ii) Standing crops damaged.</li></ul>
3.	15 Oct.	Jind	Heavy rains		<ul><li>i) 6 villages flooded.</li><li>ii) Crop over thousands of hectares destroyed.</li></ul>
		HIMACHAL PRADESH			
1. 2.	5 Mar. 14 Mar.	Entire State Entire State	Heavy rains Heavy rains	16 persons died due to landslide.	Rabi crop damaged.
3. 4.	20 Aug. 2 Oct.	Mandi Mandi	Heavy rains Heavy rains	4 persons buried alive.	Bilaspur-Mandi National Highway closed due landslide.
5. 6.	17 & 18 Oct. 20 Oct.	Kangra and Shimla Kullu	Heavy rains Heavy rains	11 persons died and 2 injured.	<ul> <li>i) Rohtang Pass completely closed.</li> <li>ii) Life in northern region paralysed.</li> <li>i) 2000 Bighas of land, 8 bridges and 3 to 4 km stret</li> </ul>
0.	20 001.	Kuliu	ricavy rains		of a road washed away.  ii) 100 houses damaged.
*	Whole year	0.295 m. ha.		i) 71 persons died. ii) 221 cattle lost.	<ul><li>i) 2.469 million people affected.</li><li>ii) Crop in 0.278 m. ha. affected.</li><li>iii) 5050 houses damaged.</li></ul>
	16	KARNATAKA			
1.	30 Jun.	(a) Kodagu	Heavy rains	One person swept away at Peraje	Several low lying areas inundated.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties		Extent of damage
		(b) Uttara Kannada	Heavy rains		i)	Landslides reported near Thethikallu village from where 16 families evacuated.
					ii)	Low lying areas inundated and many paddy fields swept away.
					iii)	Many houses collapsed and more than one hundred partially damaged.
					iv)	A pump house and a well collapsed in Honavar taluka.
					v)	Big banyan trees, arecanut, coconut and jack fruit trees fell.
					vi)	Large number of electric and telephone poles uprooted disrupting power supply and telecommunication links.
		(c) Dakshina Kannada	Heavy rains	4 members of a family buried alive under a hillock, when it collapsed due to heavy rains at Neerumarga in Mangalore taluka.		
2.	1 Jul.	Kodagu and Shimoga	Flash flood (Tunga and Cauvery)	<ul> <li>i) 5 persons washed away and an old woman died under a wall collapse in Kodagu district.</li> <li>ii) An elephant washed away in Shimoga district.</li> </ul>	i) ii) iii)	A few houses collapsed / damaged. Many paddy fields inundated. Several roads / bridges damaged.
3.	4 Jul.	Dakshina Kannada	Flash flood (Dasikhan)	<ul> <li>i) Two persons washed away when a bridge on the river Dasikhan collapsed near Hosangodi and Siddapura.</li> <li>ii) A person died due to electrocution at Palimaru when an electric wire snapped.</li> </ul>		
4.	20 Jul.	Bangalore	Heavy rains	A 6-year old boy died when a wall collapsed upon him in Ulsoor areas of Bangalore city.		
5.	23 Jul.	Bangalore	Heavy rains	Dangaioro oky.	i) ii)	A few houses collapsed and trees uprooted. Low lying areas flooded and waterlogged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
6.	24 Jul.	Uttara Kannada	Flash flood (Gundabal)	A few livestock washed away.	<ul> <li>i) Siddapura and Honavar talukas affected</li> <li>ii) 15 villages marooned.</li> <li>iii) Several houses waterlogged. 38 houses completely collapsed and 178 houses partially damaged.</li> <li>iv) Thousands of people evacuated to safer places.</li> <li>v) Damage to property and agriculture including arrogant and agriculture including</li> </ul>
7.	31 Jul.	Chikmagalur	Flash flood (Hemanathi)	One person washed away and two agricultural labourers died in Mudigere taluka.	arecanut and coconut reported.
8.	1 Aug.	Dakshina Kannada	Flash flood	A man washed away while passing over the bridge at Puttur.	
9.	2 Aug.	Dakshina Kannada	Flash flood	A 3-year old child washed away in a canal at Golithady.	
10.	4 Aug.	Bangalore	Flash flood (Vrushabha- vathi)	One person washed away in the river near Nagarabhavi area of the Bangalore city.	<ul> <li>i) Bangalore city areas affected inundating low lying areas.</li> <li>ii) Several roadside trees in Ulsoor, Chamarajpet, Sheshadri road and Nagarabhavi areas uprooted, disrupting traffic. Many electric poles also uprooted.</li> <li>iii) About 10 houses collapsed.</li> </ul>
11.	15 Aug.	(a) Dharwad	Heavy rains	Two children died under a collapsed bus shelter at Hubli.	my About to Houses conapsed.
	40	(b) Kolar	Heavy rains	buo onoicor at riubii.	i) Low lying areas inundated. ii) A few houses collapsed.
12.	19 Aug.	Bangalore	Heavy rains		Low lying areas inundated, water entered into the shops,
13.	25 Aug.	Gulbarga	Heavy rains	2 persons died under a wall when it collapsed following heavy rains at Afzalpura	bookstalls and telephone booths damaging them heavily. Damages to roads and bridges reported.
14.	16 Aug.	Dharwad	Heavy rains	One person died and a woman and a child injured under a collapsed house at Gajendragad.	

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
15.	2 Sept.	Bangalore	Heavy rains	One woman died and a girl injured under a collapsed house following heavy rains in the Bangalore city.	
16.	21 Sept.	(a) Bidar	Heavy rains	One person died at Nagarda village in Chincholi taluka.	
		(b) Gulbarga	Heavy rains	A 7-year old girl died due to house collapse while 7 other sustained serious injuries at Hesaragundagi in Afzalpur taluka.	
17.	23 Sept.	Bangalore	Heavy rains	A 70-year old man died and two other injured in a wall collapse in the Bangalore city.	<ul><li>i) A few houses damaged.</li><li>ii) A few trees uprooted, traffic disrupted.</li></ul>
18.	Sept. (3 <sup>rd</sup> week)	Gulbarga	Heavy rains	Bungulore oxy.	Cereals, pulses, groundnut, sugarcane in lakhs of hectares damaged.
19.	oct. (1st and 2nd week)	Entire State	Heavy rains	<ul> <li>i) 198 persons died and 34 other injured.</li> <li>ii) 947 livestock perished.</li> </ul>	<ul> <li>i) 14,515 houses fully and 41,958 partially damaged.</li> <li>ii) Major and minor crop including cotton, sunflower and onion in several thousand hectares affected.</li> <li>iii) Extensive loss to public and private property reported.</li> <li>iv) Road stretching about 1055 km damaged.</li> <li>v) Some two-wheelers damaged and a car completely crushed under uprooted trees in Bangalore city and another Maruti car completely crushed due to wall collapse in Chincholi town.</li> <li>vi) One canal in Narayanpura village and a tank in Shimoga district breached and another tank named Dodda Ranganath tank in Kollegala town flooded.</li> </ul>
*	Whole year			i) 310 people died. ii) 26413 animals lost.	
		KERALA			
1.	15 May	Thiruvananthapuram	Heavy rains		Widespread damage to houses and trees reported.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
2.	28 Jun.	ldukki	Heavy rains		Widespread damage to houses, trees, crops and also to telegraphic and electric poles reported.
3.	2-6 Jul.	Idukki, Kasaragode, Kottayam, Malappuram, Palakkad, Thiruvanan- thapuram and Waynad	Heavy rains	45 people died.	Widespread damage to houses, trees, electric lines and rubber plantation.
4.	12-15 Jul.	Ernakulam, Idukki, Malappuram, Pathana- mthitta and Thrissur	Heavy rains	4 persons and one child died.	Several houses damaged.
5.	10-17 Oct.	Kollam, Kottayam, Kozhikode, Malappuram, Pathanamthitta, Thiruvan- anthapuram and Waynad	Severe flood	44 persons died.	<ul> <li>i) Widespread loss to crops reported.</li> <li>ii) One bridge damaged in Kollam.</li> <li>iii) 1039 houses damaged.</li> <li>iv) Property worth crores of rupees damaged.</li> </ul>
6.	1-5 Nov.	Idukki and Thiruvanantha- puram	Heavy rains	3 persons injured in landslide.	<ul> <li>i) 45 houses fully and 154 partially damaged due to landslides.</li> <li>ii) Widespread loss to crops reported.</li> <li>iii) Train service between Nagarcoil and Thiruvananthapuram dislocated.</li> </ul>
7.	11 & 12 Nov.	Palakkad and Pathanamthitta	Heavy rains		A few houses and one bridge damaged.
*	Whole year	0.190 m. ha.		244 persons died.	<ul><li>i) 14 million people affected.</li><li>ii) Crop in 0.190 m. ha. affected.</li><li>iii) 38,430 houses damaged.</li></ul>

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
		MADHYA PRADESH			
1.	11 Sept.	Raigarh	Heavy rains		Paddy crop damaged.     Loss of property reported.
2.	14 & 15 Sept.	Betul, Chhindwara, East Nimar and Hoshangabad	Heavy rains	3 children and one person died in house collapse.	
3.	17 Sept.	Shahdol	Heavy rains	•	<ul><li>i) Several houses collapsed at Amarkantak.</li><li>ii) Loss of property reported.</li></ul>
		MAHARASHTRA			
1. 2.	12 Jan. 21 Jan.	Nashik Vidarbha region	Heavy rains Heavy rains		Production of Rangda variety of Onion reduced to 40%.  i) Production of orange crop dropped down from 1.48 lakh tonnes to 1.17 lakh tonnes.  ii) Jowar and wheat crop over 33,000 hectares destroyed.
3. 4.	8 Jun. 9 Jun.	Thane Thane	Heavy rains Heavy rains	2 persons injured. One person died and 4 injured at	Several trees uprooted. Many houses collapsed.
5. 6. 7.	10 Jun. 14 Jun. 27 & 28 Jun.	Ratnagiri Wardha Mumbai	Heavy rains Heavy rains Heavy rains	Murbad. 5 persons injured. One person died at Hinganghat. 5 persons died.	Several trees uprooted and a few houses collapsed.  Rail/road traffic disrupted.
8.	1 & 2 Jul.	(a) Buldhana (b) Mumbai and Thane	Heavy rains Heavy rains	13 persons died. One person died.	- Traffic disrupted due to waterlogging.
9. 10. 11.	10 Jul. 12 Jul. 29 & 30 Jul.	Nashik Mumbai Marathwada region	Heavy rains Heavy rains Heavy rains	9 persons died. 2 persons died. 25 persons died.	Low lying areas submerged and traffic disrupted.  i) Many houses collapsed.  ii) Vast areas waterlogged, traffic disrupted.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
12.	31 Jul.	Nagpur	Heavy rains	One woman died at Antri village due to house collapse.	Damage to property and agriculture reported.
13.	21 Aug.	Nagpur	Heavy rains	One person died at Goregaon due to house collapse.	Damage to property and agriculture reported.
14.	Sept. (3 <sup>rd</sup> week)	Vidarbha and Marathwada regions	Severe flood	35 persons died.	<ul> <li>i) Several houses collapsed.</li> <li>ii) Extensive damage to property and agriculture reported.</li> </ul>
15. 16. *	14-15 Oct. 21 Oct. Whole year	Ahmadnagar and Dhule Jalgaon and Solapur 0.005 m.ha.	Heavy rains Heavy rains	5 persons died and one injured. 11 persons died. i) 537 people died. ii) 2000 cattle perished.	Damage to property and agriculture reported. Damage to property and agriculture reported. i) 0.016 million population affected. ii) Crop in 5000 hectares affected. iii) 1351 houses damaged.
		MEGHALAYA			
*	Whole year	Negligible		i) 4 persons died. ii) 2609 cattle perished.	i) 10 million people affected. ii) Minor damages to crops reported. iii) 100 houses damaged.
		ORISSA			
1.	12 Sept.	Jharsuguda	Flash flood	2 persons swept away.	<ul><li>i) Over 1000 houses damaged.</li><li>ii) 2000 families shifted to safer places.</li></ul>
2. 3.	18 Sept. 22 & 23 Nov.	Kenderapara Many parts of the State	Flash flood Heavy rains	2 boys died at Pottamundi.	i) One lakh hectares of land affected. ii) Extensive damage to rabi crop, paddy and vegetables reported.
*	Whole year	0.437 m.ha.		i) 34 persons died. ii) 61 cattle perished.	i) 4.840 million population affected. ii) Crop in 0.437 m.ha. affected. iii) 72,738 houses damaged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
		PUNJAB			
1. 2.	28 Feb. 7 Oct.	Entire State Bhatinda	Heavy rains Heavy rains		Rabi crop, fruits and vegetables damaged.  Paddy and cotton crop worth over lakhs of rupees destroyed due to waterlogging.
3.	16 & 17 Oct.	Many parts of the State	Heavy rains		Paddy and cotton crop worth crores of rupees destroyed.
*	Whole year	0.013 m. ha.		<ul><li>i) 46 persons died.</li><li>ii) 72 cattleheads perished.</li></ul>	i) 6000 people affected. ii) Crop in 0.013 m.ha. affected.
		RAJASTHAN			
1. 2. 3. 4.	3 Jul. 13-14 Jul. 26 Aug. 21-25 Sept.	Bikaner and Sikar Jaipur and Kota Ajmer and Jaipur Alwar, Bundi, Hanuman- garh, Jaisalmer and Sawai Madhopur	Heavy rains Heavy rains Heavy rains Heavy rains	One person and a child died. 2 school children swept away. 3 persons died and 4 injured. 7 persons died.	6 houses collapsed.  Hundreds of kutcha houses damaged.
5.	16 & 17 Oct.	Bikaner and Jodhpur	Heavy rains	<ul> <li>i) One woman and a girl died.</li> <li>ii) Hundreds of animals and birds died in Pokhran.</li> <li>iii) 236 goats died in Bikaner.</li> </ul>	
*	Whole year	0.159 m.ha.		<ul> <li>i) 31 persons died.</li> <li>ii) 51,295 cattle-heads perished.</li> </ul>	i) 0.669 million people affected. ii) Crop in 0.097 m.ha. affected. iii) 9341 houses damaged.
		SIKKIM			
1.	30 May & 4 Jun	Entire State	Heavy rains	<ul><li>i) 10 persons died.</li><li>ii) 40 cattle lost</li></ul>	Landslides reported

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
2.	20 Jun.	East and North Sikkim	Heavy rains	17 persons severely injured.	i) Landslides reported. ii) 250 houses collapsed and 100 other partially damaged.
3.	8 Jul.	Entire State	Heavy rains	16 persons died and one injured.	Landslides reported.
*	Whole year			i) 43 persons died. ii) 40 cattle lost.	
		TAMIL NADU			
1.	11 Oct.	Kanniyakumari	Heavy rains		<ul><li>i) Many canals breached.</li><li>ii) Crops and roads damaged.</li></ul>
2.	Nov. (1st and 2nd	Entire State	Heavy rains	82 persons died.	<ul> <li>i) 322 hectares of agricultural land with various crops and 8831 hectares of paddy crop damaged.</li> </ul>
	week)				ii) 2 Thermal Power Stations crippled.
3.	4-12 Dec.	Cuddalore, Madurai,Nagapattinam, Perambalur, Thanjavur, Tiruchy, Tirunelveli and Villupuram	Heavy rains	28 persons died.	<ul><li>iii) 1532 huts damaged.</li><li>i) Standing crops in several thousand acres of land destroyed.</li><li>ii) Thousands of huts damaged.</li></ul>
		TRIPURA			
1. 2. 3.	15 Jul. 18 Jul. 23 Jul.	South Tripura Entire State West Tripura	Flash flood Flash flood Flash flood	17 persons died	200 families affected. 1900 families affected. i) National Highway No. 44 washed away. ii) Forest plantation affected. iii) 70,000 bighas cf land submerged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
		UTTAR PRADESH	٩	•	
1. 2.	28 Jun. 5-11 Jul.	Chamoli Gorakhpur	Heavy rains Severe flood	<ul><li>6 persons died.</li><li>i) 2 persons died.</li><li>ii) Many animals perished.</li></ul>	<ul> <li>i) Normal life disrupted</li> <li>ii) Several roads flooded.</li> <li>iii) Jal Nigam office flooded.</li> <li>iv) 28 villages in Tamkuhiraj tehsil, 16 villages in Amawakhas region and 22 villages in Pipra Ghat inundated.</li> <li>v) Standing crop in upper region and especially sugarcane in low lying areas completely destroyed.</li> </ul>
3.	18-27 Jul.	East Uttar Pradesh	Severe flood (Rapti, Gandak and Ghaghara)	<ul><li>i) 81 persons died.</li><li>ii) 264 cattleheads perished.</li></ul>	<ul> <li>i) One lakh hectares of crop-land damaged.</li> <li>ii) 12 lakh people in 2000 villages affected.</li> <li>iii) 317 houses fully and 918 partially damaged.</li> <li>iv) Paddy and sugarcane crop damaged.</li> </ul>
4.	14 Aug.	Chamoli	Heavy rains	40 persons died in a landslide at Rudraprayag.	ivy i addy and odgaround drop damagod.
5.	19 Aug.	Pithoragarh	Heavy rains	204 pilgrims died at Malpa due to landslide.	
6.	1-6 Sept.	East Uttar Pradesh	Severe flood	Approx. 300 people died due to floods and after effects like spreading of epidemic.	<ul> <li>i) 1,20,000 population affected.</li> <li>ii) 128 houses fully and 1260 partially damaged.</li> <li>iii) Many villages affected.</li> <li>iv) Crop in several hectares destroyed.</li> </ul>
7.	22 Oct.	Jyotiba Rao Phulenagar and Moradabad	Flash flood	10 persons died.	Many houses collapsed.
8.	8 Nov.	Farrukhabad	Heavy rains	2 children died due to wall collapse at Kannoj.	
*	Whole year	2.523 m.ha.		i) 1390 persons died. ii) 3525 cattle perished.	i) 12.191 million people affected. ii) Crop in 1.415 m.ha. affected. iii) 3,84,896 houses damaged.

S.N.	Date / Period	Area affected	Intensity (River)	Casualties	Extent of damage
		WEST BENGAL			
1.	11 Jun.	Jalpaiguri	Heavy rains		<ul><li>i) 3500 people became homeless.</li><li>ii) 221 houses damaged.</li></ul>
2.	7 Jul.	Darjeeling	Heavy rains	<ul><li>i) 14 persons died and 4 children missing in a landslide incident.</li><li>ii) 200 cattle lost.</li></ul>	200 houses damaged.
3.	12 Jul.	Darjeeling	Heavy rains	12 persons died and 3 injured due to landslide	Extensive damage to property reported.
4.	17 Jul.	Murshidabad	Flash flood (Padma)	<ul><li>i) 165 persons died.</li><li>ii) 12 cattle lost.</li></ul>	<ul><li>i) About one lakh people affected due to breaching the embankment of the river Padma.</li><li>ii) 50 houses swept away.</li></ul>
5.	19 Jul.	Malda	Flash flood (Ganga)		<ul><li>i) About 5 lakh people affected.</li><li>ii) About 50 to 60 villages washed away.</li></ul>
6.	26 Jul. to 2 Aug.	Coochbehar, Jalpaiguri, Malda, Uttar Dinajpur and Dakshin Dinajpur	Severe flood (Teesta)	2 persons died.	<ul><li>i) About 4.25 lakh people affected.</li><li>ii) About 10,000 people shifted to safer places.</li><li>iii) About 950 houses damaged.</li></ul>
7. 8.	5 Aug. 14 Aug.	Darjeeling Darjeeling	Heavy rains Heavy rains	5 persons and a child died.	Landslides reported.  Many roads damaged due to landslides in Kalimpong.
9.	Aug. (4th week) to Sept (2nd week)	Bardhaman, Calcutta, Coochbehar, Jalpaiguri, Malda, Medinipur, Murshidabad, Nadia, Uttar Dinajpur, Dakshin Dinajpur, North 24 Parganas and South 24 Parganas	Severe flood (Ganga, Mahanadi, Teesta, Ichhamati, Jaldhaka etc.)	Total 300 human lives lost and 212 animals lost.	<ul> <li>i) Nearly 24 lakh people affected.</li> <li>ii) 40,000 houses collapsed and 14,000 fully and 34,000 partially damaged.</li> <li>iii) River embankments breached at several places.</li> <li>iv) Several thousand hectares of paddy and jute fields inundated.</li> </ul>

Period (River)	S.N.	Date /	Area affected	Intensity	Casualties	Extent of damage
i onos		Period		(River)		

#### **UNION TERRITORIES**

#### CHANDIGARH

24 & 25 Chandigarh Sept.

Heavy rains

2 children died and 4 persons badly i) injured in a house collapse. ii)

i) 15 villages inundated.ii) 50 houses damaged.

Casualties and damages due to Floods and Heavy rains as reported by the Central Water Commission and Ministry of Agriculture.

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
			·	TABLE – XII : CYCLONIC STORM	
		ARABIAN SEA CYCLONE			
1.	4-10 Jun.	Formation	Very Severe	1173 people died and another 1774	In Gujarat,
		11.5ºN / 70.0ºE at 0900 UTC of 5 <sup>th</sup>	Cyclonic Storm	missing and feared to have been washed away.	<ul> <li>i) More than 2.5 lakh houses destroyed or damaged.</li> <li>ii) Total extent of damage worth Rs. 190 crores reported.</li> </ul>
		<b>Landfall</b> 50 kms. of NNE of Porbandar on 9 <sup>th</sup> morning.			
		<b>Dissipation</b> 1200 UTC of 10 <sup>th</sup> over Punjab and adjoining Himachal Pradesh			
2.	11-17 Oct	Formation	Cyclonic Storm		No major damage reported
		19.0 <sup>o</sup> N / 69.0 <sup>o</sup> E on 16 <sup>th</sup> evening.			

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
		Landfall			
		Over South Gujarat coast near Veraval in the morning of 17th.		. *	
		Dissipation			
		Over South Rajasthan, North Gujarat and Northwest Madhya Pradesh on 17th.			
		BAY CYCLONE			
1.	13-16 Nov.	Formation	Very Severe Cyclonic Storm	16 people died.	In Andhra Pradesh, i) About 28,000 families affected.
		16.0°N / 84.0°E at 0300 UTC of 15 <sup>th</sup>	Gycloriic Gloiii		ii) Thousands of houses damaged.
		<b>Landfall</b> South of Visakhapatnam on 15 <sup>th</sup> evening			
		<b>Dissipation</b> Central parts of East Madhya Pradesh on 16 <sup>th</sup> evening			
			•		•

S.N.	Date / Period	Area affected	Intensity	Casualties	Extent of damage
2.	19-22 Nov.	Formation  17.5°N / 87.5°E, 520 km. South of Balasore at 0600 UTC of 21st.  Landfall  Over West Bengal Coast, East of Sagar Islands around noon of 22nd.  Dissipation  Over NE India and Bangladesh on 22nd	Very Severe Cyclonic Storm		In Orissa, i) Damage to crops reported in North Balasore. ii) Many trees and electric poles uprooted in North Balasore. In West Bengal, i) 25,500 people in 8 villages of Sagar Island affected. ii) 3000 mud houses collapsed. iii) One lakh people affected in North and South 24 Parganas and Medinipur districts.