



INDIA METEOROLOGICAL DEPARTMENT

DISASTROUS WEATHER EVENTS, 2009



ISSUED BY
NATIONAL CLIMATE CENTRE
OFFICE OF THE
ADDITIONAL DIRECTOR GENERAL OF METEOROLOGY (RESEARCH)
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Cover Photo : A young man walks across Bhopal's Upper Lake, which has shrunk to an eighth of its original area, July 12, 2009.

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DISASTROUS WEATHER EVENTS OF 2009

The most striking disastrous weather events of 2009 were the following:

1. Cold wave conditions prevailed over northern parts of the country and claimed 79 human lives.
2. Heat wave swept major portion of Northern and Central parts of India and claimed 216 human lives.
3. During summer monsoon of 2009, floods and heavy rains claimed 1206 human lives apart from loss of large number of live stocks and extensive damage to public/private property.
4. The Cyclonic Storm 'AILA' formed during 23-26 May 2009 over the Bay of Bengal (West Central) crossed Indian coast close to Sagar Islands as severe cyclonic storm at 1200 UTC of 25th and caused loss of 100 human lives in West Bengal and also caused extensive damage to crops and public property.
5. The Cyclonic Storm 'PHYAN' formed during 9-12 November 2009 over the Arabian Sea (300 kms southwest of Goa) crossed Maharashtra coast between Alibag and Mumbai and caused loss of 15 human lives and also caused extensive damage to crops and public property.

The summary of these natural hazards is based on various reports of the India Meteorological Department and press information. The areas affected by the adverse weather conditions are depicted season wise on four maps.

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S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
<p align="center">TABLE - I : SNOWFALL</p> <p align="center">CRITERIA</p> <p align="center">Moderate : 7.6 to 34.9 cm in 24 hrs.</p> <p align="center">Heavy : ≥ 35.0 cm in 24 hrs.</p>					
1.	6 Feb.	Kupwara (Jammu & Kashmir)	Heavy	4 persons died.	i) Avalanche reported. ii) Jammu - Srinagar highway closed.
2.	10 Feb.	Ramban (Jammu & Kashmir)	Moderate		i) Landslide reported. ii) Jammu-Srinagar NH blocked and more than 1500 vehicles stranded.
3.	7 Apr.	Pauri Garhwal (Uttarakhand)	Moderate		Electric poles broken and rail traffic disrupted.
4.	14 Apr.	Kupwara (Jammu & Kashmir)	Heavy	7 army personnel buried alive.	Avalanche reported.

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

CRITERIA

(A) When; Normal minimum temperature is 10°C or more.

Cold wave : Night temperature 5°C to 6°C below normal.

Severe cold wave : Night temperature 7°C or more below normal.

(B) When; Normal minimum temperature is less than 10°C.

Cold wave : Night temperature 4°C to 5°C below normal.

Severe cold wave : Night temperature 6°C or more below normal.

1.	1 Jan.	Phagwara (Punjab)	Severe cold wave	One person died.	
2.	3-4 Jan.	(a) Begusarai, Krishanganj, Madhepura , Muzzafarpur and Shekhpura (Bihar)	Severe (Both A & B as appropriate)	12 persons died.	
		(b) Ambedkar Nagar, Bahraich, Barabanki, Faizabad, Hardoi, Jaunpur, Kanpur, Lucknow, Mahoba, Muzzafarnagar, Shahjanpur and St.Kabirnagar (Uttar Pradesh)	Severe cold wave (B)	35 persons died.	Rail and air traffic affected due to fog.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
3.	7-12 Jan.	Allahabad, Balarampur, Deorai, Fatehpur, Gorakhpur, Jyotiba phule nagar, Kaushambi, Kushinagar, Lucknow, Maharajaganj, Shajhanpur, Siddharthnagar, Sonebhadra (Uttar Pradesh)	Severe cold wave (B)	24 persons died.	
4.	22 Nov.	Jalandhar (Punjab)	Severe cold wave (A)	One person died.	
5.	27 Dec.	Gaziabad (Uttar Pradesh)	Severe cold wave (B)	3 persons died.	
6.	29-31 Dec.	Patna (Bihar)	Severe cold wave (A)	3 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
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TABLE – III : HEAT WAVE

CRITERIA

(A) When; Normal maximum temperature is 40°C or less.

Heat wave : Departure from normal is 5°C to 6°C.

Severe heat wave : Departure from normal is 7°C or more.

(B) When; Normal maximum temperature is more than 40°C.

Heat wave : Departure from normal is 4°C to 5°C.

Severe heat wave : Departure from normal is 6°C or more.

1.	1 Apr.	Jagatsingpur (Orissa)	Severe heat wave (A)	One person died.
2.	6 Apr.	Gadchiroli (Maharashtra)	Severe heat wave (B)	One person died.
3.	19-30 Apr.	Some parts of Orissa	Severe (Both A & B as appropriate)	21 persons died.
4.	21-25 Apr.	(a) Garhwa, Chaibasa Hazaribagh and Ranchi (Jharkhand)	Severe heat wave (A)	9 persons died.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		(b) Akola, Amravati, Gadchiroli, Nanded Wardha and Yavatmal (Maharashtra)	Severe (Both A & B as appropriate)	7 persons died.	
		(c) Sriganganagar (Rajasthan)	Severe heat wave (A)	One person died.	
5.	26-28 Apr.	(a) Jamshedpur (Jharkhand)	Severe heat wave (A)	2 persons died.	
		(b) Chandrapur and Wardha (Maharashtra)	Severe heat wave (B)	2 persons died.	
		(c) Kota (Rajasthan)	Severe heat wave (A)	2 persons died.	
		(d) Bankura, Bardhaman, Howrah and South 24 Parganas (West Bengal)	Severe heat wave (A)	4 persons died.	
6.	29-30 Apr.	(a) Indore (Madhya Pradesh)	Severe heat wave (A)	One woman and a child died.	
		(b) Bhatinda (Punjab)	Severe heat wave (A)	One person died.	Damage to Wheat crop at many places reported.
		(c) Garhwal and Kumaon (Uttarkhand)	Moderate heat wave (A)		i) Forest fire reported. ii) 2426 hectares of jungle destroyed.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
7.	3-8 May	(a) Amravati and Yavatmal (Maharashtra)	Severe heat wave (B)	6 persons died.	
		(b) Muashidabad (WestBengal)	Severe heat wave (A)	2 persons died.	
8.	9 May	Few districts of Orissa	Severe (Both A & B as appropriate)	7 persons died.	
9.	10-12 May	Amravati, Chandrapur and Nagpur (Maharashtra)	Severe heat wave (B)	5 persons died.	
10	13 & 16 May	a) Bhandara and Yavatmal (Maharashtra)	Severe heat wave (B)	2 persons died.	
		b) Amritsar and Bhatinda (Punjab)	Severe (Both A & B as appropriate)	4 persons died.	
		c) Jaipur (Rajasthan)	Severe heat wave (B)	One person died.	
11	17-19 May	a) Betul and Shivpuri (Madhya Pradesh)	Severe heat wave (B)	2 persons died and 4 other injured.	
		b) Bhatinda and Patiala (Punjab)	Severe heat wave (B)	3 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		c) Dholpur, Pali and Ranibazar (Rajasthan)	Severe heat wave (Both A & B as appropriate)	4 persons died.	
12	20 May	Bhatinda (Punjab)	Severe heat wave (B)	2 persons died.	
13.	21 May	a) Sirsa (Haryana)	Severe heat wave (B)	3 persons died.	
		b) Chandigarh (Union Territory)	Severe heat wave (A)	One student died.	
14.	25 May	Bhiwani (Haryana)	Severe heat wave (A)	One person died.	
15	26 May-4 Jun	A) Amravati, Bhandara, Chandrapur, Gadchiroli, Nagpur and Yeotmal (Maharashtra)	Severe heat wave (Both A & B as appropriate)	7 persons died.	
		b) Amritsar, Bhatinda and Jalandhar (Punjab)	Severe (Both A & B as appropriate)	7 persons died.	
16.	10-24 Jun.	Entire Orissa	Severe heat wave (Both A & B as appropriate)	50 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
17.	20 Jun.	a) Bhandara (Maharashtra)	Severe heat wave (Both A & B as appropriate)	One person died.	
		b) Medinipur (West Bengal)	Severe heat wave(A)	One person died.	
18.	22 & 23 Jun.	Balarampur, Lucknow and Sultanpur (Uttar Pradesh)	Severe (Both A & B as appropriate)	3 persons died.	
19.	23 Jun.	Bokaro, Chaibasa, Gumla, Jamshedpur, Ramgarh and Saraikela (Jharkhand)	Severe heat wave (A)	12 persons died.	
20.	24 Jun.	Bardhaman (West Bengal)	Severe heat wave (A)	2 persons died.	
21.	25-30 Jun.	Amritsar, Bhatinda, Ferozpur, Jalandhar and Roop Nagar (Punjab)	Severe heat wave (Both A & B as appropriate)	18 persons died.	Crops in 57,000 hectares damaged.
22.	25 & 26 Jun.	Ranchi (Jharkhand)	Severe heat wave (B)	3 persons died.	
23.	28 Jun.	Faridabad and Hisar (Haryana)	Severe heat wave (B)	2 persons died.	
24.	21 Jul.	Golaghat (Assam)	Severe heat wave (B)	2 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
25.	2 Aug	Bhtinda and Moga (Punjab)	Severe heat wave (B)	4 persons died.	
26.	10 Aug.	Hoshiarpur (Punjab)	Severe heat wave (A)	One person died.	
27.	13 & 14 Aug.	Amritsar, Bhatinda and Jalandhar (Punjab)	Severe heat wave (A)	6 persons died.	
28.	19 Aug.	Bhatinda (Punjab)	Severe heat wave (A)	One person died.	

TABLE – IV : SQUALL

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

CRITERIA

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

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

1.	31. Mar.	Kendrapara (Orissa)	Severe	12 persons died and 150 others injured.	i) Tornado reported. ii) 300 houses damaged. iii) Many trees/electric poles uprooted.
2.	6 Apr	Jaipur	Severe	One child died.	
3.	21 Apr.	Salem (Tamil Nadu)	Moderate		3000 plantations damaged.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
4.	22 Apr.	Bengaluru (Karnataka)	Moderate		i) Tin roof of high court building and Billboards blown away. ii) Many trees/electric poles uprooted. iii) Damage to vehicles reported.
5.	27 Apr.	Dindigul (Tamil Nadu)	Severe	One person died.	Plants / trees in 1000 acres of land damaged.
6.	9 May	Kamrup (Assam)	Moderate		i) MSEB power supply line disrupted. ii) Many Kutcha houses damaged. iii) Many trees uprooted blocking road traffic.
7.	11 May	Sawai Madhopur (Rajasthan)	Severe	2 persons died and 8 injured	Roof of a house collapsed.
8.	19 May	Bhilwara, Chittorgarh, Churu and Pilani (Rajasthan)	Severe	One person died.	
9.	26 May	North Tripura ,South Tripura, West Tripura (Tripura)	Severe	One person died.	i) High tension electric line and tower damaged. ii) Electric and telecommunication system disrupted.
10.	5 June	Bastar and Raipur (Chhattisgarh)	Severe	5 persons died and 8 injured	i) Many trees uprooted. ii) Many electric poles broken. iii) Many hoardings blown away. iv) Rail traffic disrupted for hrs.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
<p style="text-align: center;">TABLE – V : GALE CRITERIA Strong : Wind speed \geq 75 kmph</p>					
1.	15 May	Akola, Amravati and Buldhana (Maharashtra)	Strong	i) 2 persons died and 14 injured. ii) 90 cattleheads perished.	i) 1350 houses damaged . ii) Crops in 1297 hectares of area damaged.
2.	20 May	Nashik (Maharashtra)	Strong	2 persons died and 18 injured.	
3.	24 May	Thiruvananthapuram (Kerala)	Strong	One woman electrocuted due to broken electric line.	
4.	26 May	a)Tirunelveli (Tamil Nadu)	Strong		4 Lakhs plantain trees damaged.
5.	23 Sep,	Salem (Tamil Nadu)	Strong		Plantain crops worth Rs.1.5 Crores damaged.
6.	13 Oct.	Coimbatore (Tamil Nadu)	Strong		1000 Banana, 400 Betul nuts and 50 Coconut plantations uprooted.
7.	30 Oct.	Kanniyakumari (Tamil Nadu)	Strong		10,000 Banana plantations damaged.

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TABLE – VI : DUSTSTORM

CRITERIA

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

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

1.	20 May	Gurgaon, Yamuna Nagar (Haryana)	Severe	5 persons died and 3 children injured.	Roof of a house collapsed.
2.	23 May	Jalandhar(Punjab)	Severe	One person died.	i) A terrace of an old building collapsed near Company Bagh Chowk ii) Trees and electric poles uprooted iii) Damage to many vehicles and houses reported
3.	22 Jun.	Amravati (Maharashtra)	Severe	One person died.	i) Many houses collapsed. ii) Many trees uprooted.
4.	8 Jul.	Dholpur (Rajasthan)	Severe	One child died.	

TABLE – VII : LIGHTNING

1.	9 Feb.	Jaisalmer (Rajasthan)		2 children died.
2.	12 Mar.	Kozhikode (Kerala)		One woman died.
3.	14 Mar.	a) Kottayam (Kerala)		2 persons died.

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2. Heat wave swept major portion of Northern and Central parts of India and claimed 216 human lives.
3. During summer monsoon of 2009, floods and heavy rains claimed 1206 human lives apart from loss of large number of live stocks and extensive damage to public/private property.
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The summary of these natural hazards is based on various reports of the India Meteorological Department and press information. The areas affected by the adverse weather conditions are depicted season wise on four maps.

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2.	10 Feb.	Ramban (Jammu & Kashmir)	Moderate		i) Landslide reported. ii) Jammu-Srinagar NH blocked and more than 1500 vehicles stranded.
3.	7 Apr.	Pauri Garhwal (Uttarakhand)	Moderate		Electric poles broken and rail traffic disrupted.
4.	14 Apr.	Kupwara (Jammu & Kashmir)	Heavy	7 army personnel buried alive.	Avalanche reported.

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TABLE – II : COLD WAVE

CRITERIA

(A) When; Normal minimum temperature is 10°C or more.

Cold wave : Night temperature 5°C to 6°C below normal.

Severe cold wave : Night temperature 7°C or more below normal.

(B) When; Normal minimum temperature is less than 10°C.

Cold wave : Night temperature 4°C to 5°C below normal.

Severe cold wave : Night temperature 6°C or more below normal.

1.	1 Jan.	Phagwara (Punjab)	Severe cold wave	One person died.	
2.	3-4 Jan.	(a) Begusarai, Krishanganj, Madhepura , Muzzafarpur and Shekhpura (Bihar)	Severe (Both A & B as appropriate)	12 persons died.	
		(b) Ambedkar Nagar, Bahraich, Barabanki, Faizabad, Hardoi, Jaunpur, Kanpur, Lucknow, Mahoba, Muzzafarnagar, Shahjanpur and St.Kabirnagar (Uttar Pradesh)	Severe cold wave (B)	35 persons died.	Rail and air traffic affected due to fog.

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4.	22 Nov.	Jalandhar (Punjab)	Severe cold wave (A)	One person died.	
5.	27 Dec.	Gaziabad (Uttar Pradesh)	Severe cold wave (B)	3 persons died.	
6.	29-31 Dec.	Patna (Bihar)	Severe cold wave (A)	3 persons died.	

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TABLE – III : HEAT WAVE

CRITERIA

(A) When; Normal maximum temperature is 40°C or less.

Heat wave : Departure from normal is 5°C to 6°C.

Severe heat wave : Departure from normal is 7°C or more.

(B) When; Normal maximum temperature is more than 40°C.

Heat wave : Departure from normal is 4°C to 5°C.

Severe heat wave : Departure from normal is 6°C or more.

1.	1 Apr.	Jagatsingpur (Orissa)	Severe heat wave (A)	One person died.
2.	6 Apr.	Gadchiroli (Maharashtra)	Severe heat wave (B)	One person died.
3.	19-30 Apr.	Some parts of Orissa	Severe (Both A & B as appropriate)	21 persons died.
4.	21-25 Apr.	(a) Garhwa, Chaibasa Hazaribagh and Ranchi (Jharkhand)	Severe heat wave (A)	9 persons died.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		(b) Akola, Amravati, Gadchiroli, Nanded Wardha and Yavatmal (Maharashtra)	Severe (Both A & B as appropriate)	7 persons died.	
		(c) Sriganganagar (Rajasthan)	Severe heat wave (A)	One person died.	
5.	26-28 Apr.	(a) Jamshedpur (Jharkhand)	Severe heat wave (A)	2 persons died.	
		(b) Chandrapur and Wardha (Maharashtra)	Severe heat wave (B)	2 persons died.	
		(c) Kota (Rajasthan)	Severe heat wave (A)	2 persons died.	
		(d) Bankura, Bardhaman, Howrah and South 24 Parganas (West Bengal)	Severe heat wave (A)	4 persons died.	
6.	29-30 Apr.	(a) Indore (Madhya Pradesh)	Severe heat wave (A)	One woman and a child died.	
		(b) Bhatinda (Punjab)	Severe heat wave (A)	One person died.	Damage to Wheat crop at many places reported.
		(c) Garhwal and Kumaon (Uttarkhand)	Moderate heat wave (A)		i) Forest fire reported. ii) 2426 hectares of jungle destroyed.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
7.	3-8 May	(a) Amravati and Yavatmal (Maharashtra)	Severe heat wave (B)	6 persons died.	
		(b) Muashidabad (WestBengal)	Severe heat wave (A)	2 persons died.	
8.	9 May	Few districts of Orissa	Severe (Both A & B as appropriate)	7 persons died.	
9.	10-12 May	Amravati, Chandrapur and Nagpur (Maharashtra)	Severe heat wave (B)	5 persons died.	
10	13 & 16 May	a) Bhandara and Yavatmal (Maharashtra)	Severe heat wave (B)	2 persons died.	
		b) Amritsar and Bhatinda (Punjab)	Severe (Both A & B as appropriate)	4 persons died.	
		c) Jaipur (Rajasthan)	Severe heat wave (B)	One person died.	
11	17-19 May	a) Betul and Shivpuri (Madhya Pradesh)	Severe heat wave (B)	2 persons died and 4 other injured.	
		b) Bhatinda and Patiala (Punjab)	Severe heat wave (B)	3 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		c) Dholpur, Pali and Ranibazar (Rajasthan)	Severe heat wave (Both A & B as appropriate)	4 persons died.	
12	20 May	Bhatinda (Punjab)	Severe heat wave (B)	2 persons died.	
13.	21 May	a) Sirsa (Haryana)	Severe heat wave (B)	3 persons died.	
		b) Chandigarh (Union Teritory)	Severe heat wave (A)	One student died.	
14.	25 May	Bhiwani (Haryana)	Severe heat wave (A)	One person died.	
15	26 May-4 Jun	A) Amravati, Bhandara, Chandrapur, Gadchiroli, Nagpur and Yeotmal (Maharashtra)	Severe heat wave (Both A & B as appropriate)	7 persons died.	
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16.	10-24 Jun.	Entire Orissa	Severe heat wave (Both A & B as appropriate)	50 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
17.	20 Jun.	a) Bhandara (Maharashtra)	Severe heat wave (Both A & B as appropriate)	One person died.	
		b) Medinipur (West Bengal)	Severe heat wave(A)	One person died.	
18.	22 & 23 Jun.	Balarampur, Lucknow and Sultanpur (Uttar Pradesh)	Severe (Both A & B as appropriate)	3 persons died.	
19.	23 Jun.	Bokaro, Chaibasa, Gumla, Jamshedpur, Ramgarh and Saraikela (Jharkhand)	Severe heat wave (A)	12 persons died.	
20.	24 Jun.	Bardhaman (West Bengal)	Severe heat wave (A)	2 persons died.	
21.	25-30 Jun.	Amritsar, Bhatinda, Ferozpur, Jalandhar and Roop Nagar (Punjab)	Severe heat wave (Both A & B as appropriate)	18 persons died.	Crops in 57,000 hectares damaged.
22.	25 & 26 Jun.	Ranchi (Jharkhand)	Severe heat wave (B)	3 persons died.	
23.	28 Jun.	Faridabad and Hisar (Haryana)	Severe heat wave (B)	2 persons died.	
24.	21 Jul.	Golaghat (Assam)	Severe heat wave (B)	2 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
25.	2 Aug	Bhtinda and Moga (Punjab)	Severe heat wave (B)	4 persons died.	
26.	10 Aug.	Hoshiarpur (Punjab)	Severe heat wave (A)	One person died.	
27.	13 & 14 Aug.	Amritsar, Bhatinda and Jalandhar (Punjab)	Severe heat wave (A)	6 persons died.	
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TABLE – IV : SQUALL

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

CRITERIA

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

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

1.	31. Mar.	Kendrapara (Orissa)	Severe	12 persons died and 150 others injured.	i) Tornado reported. ii) 300 houses damaged. iii) Many trees/electric poles uprooted.
2.	6 Apr	Jaipur	Severe	One child died.	
3.	21 Apr.	Salem (Tamil Nadu)	Moderate		3000 plantations damaged.

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5.	27 Apr.	Dindigul (Tamil Nadu)	Severe	One person died.	Plants / trees in 1000 acres of land damaged.
6.	9 May	Kamrup (Assam)	Moderate		i) MSEB power supply line disrupted. ii) Many Kutcha houses damaged. iii) Many trees uprooted blocking road traffic.
7.	11 May	Sawai Madhopur (Rajasthan)	Severe	2 persons died and 8 injured	Roof of a house collapsed.
8.	19 May	Bhilwara, Chittorgarh, Churu and Pilani (Rajasthan)	Severe	One person died.	
9.	26 May	North Tripura ,South Tripura, West Tripura (Tripura)	Severe	One person died.	i) High tension electric line and tower damaged. ii) Electric and telecommunication system disrupted.
10.	5 June	Bastar and Raipur (Chhattisgarh)	Severe	5 persons died and 8 injured	i) Many trees uprooted. ii) Many electric poles broken. iii) Many hoardings blown away. iv) Rail traffic disrupted for hrs.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
<p style="text-align: center;">TABLE – V : GALE CRITERIA Strong : Wind speed \geq 75 kmph</p>					
1.	15 May	Akola, Amravati and Buldhana (Maharashtra)	Strong	i) 2 persons died and 14 injured. ii) 90 cattleheads perished.	i) 1350 houses damaged . ii) Crops in 1297 hectares of area damaged.
2.	20 May	Nashik (Maharashtra)	Strong	2 persons died and 18 injured.	
3.	24 May	Thiruvananthapuram (Kerala)	Strong	One woman electrocuted due to broken electric line.	
4.	26 May	a)Tirunelveli (Tamil Nadu)	Strong		4 Lakhs plantain trees damaged.
5.	23 Sep,	Salem (Tamil Nadu)	Strong		Plantain crops worth Rs.1.5 Crores damaged.
6.	13 Oct.	Coimbatore (Tamil Nadu)	Strong		1000 Banana, 400 Betul nuts and 50 Coconut plantations uprooted.
7.	30 Oct.	Kanniyakumari (Tamil Nadu)	Strong		10,000 Banana plantations damaged.

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

CRITERIA

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

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

1.	20 May	Gurgaon, Yamuna Nagar (Haryana)	Severe	5 persons died and 3 children injured.	Roof of a house collapsed.
2.	23 May	Jalandhar(Punjab)	Severe	One person died.	i) A terrace of an old building collapsed near Company Bagh Chowk ii) Trees and electric poles uprooted iii) Damage to many vehicles and houses reported
3.	22 Jun.	Amravati (Maharashtra)	Severe	One person died.	i) Many houses collapsed. ii) Many trees uprooted.
4.	8 Jul.	Dholpur (Rajasthan)	Severe	One child died.	

TABLE – VII : LIGHTNING

1.	9 Feb.	Jaisalmer (Rajasthan)		2 children died.
2.	12 Mar.	Kozhikode (Kerala)		One woman died.
3.	14 Mar.	a) Kottayam (Kerala)		2 persons died.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		b) Buldhana (Maharashtra)		One person died.	
4.	17 Mar.	Kodagu (Karnataka)		6 persons died and one injured.	
5.	22 Mar.	Barmer,Jhunjhunu and Udaipur (Rajasthan)		i) 5 persons died. ii) 45 Goats perished.	
6.	23 Mar.	Amravati (Maharashtra)		3 persons died and one injured.	Extensive damage to crops reported.
7.	24 Mar.	Thiruvananthapuram (Kerala)		One person died and 2 other injured.	
8.	29 Mar.	Churu (Rajasthan)		2 persons including a child died.	
9.	8 Apr.	Jind,Mewat, Rohtak and Sonapat (Haryana)		11 persons died.	
10.	9 Apr.	Alwar (Rajasthan)		2 women and one child died and 3 persons seriously injured.	
11.	12 Apr.	Kanniyakumari (Tamilnadu)		2 persons died	
12.	13 Apr.	Kottayam (Kerala)		One person died	
13.	20 Apr.	Palakkad (Kerala)		2 persons died	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
14.	21 Apr.	a) Thiruvananthapuram (Kerala)		2 persons injured	
		b) Virudhunagar (Tamilnadu)		3 persons died	
15.	22 Apr.	Kozhikode (Kerala)		One woman and one child died.	
16.	3 May	Howrah, Malda, Nadia, North 24 Paraganas and South 24 Paraganas (West Bengal)		16 persons died.	
17.	8 May	North 24 Paraganas (West Bengal)		One person died.	
18.	11 May	Bardhaman (West Bengal)		2 persons died.	
19.	12 May	Birbhum and Howrah (West Bengal)		6 persons died.	
20.	16 May	Amravati (Maharashtra)		One person died	
21.	18 May	a) Davanagere (Karnataka)		4 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
		b) Medinipur (West Bengal)		One person died.	
		c) Parbhani (Maharashtra)		2 persons died and 2 other injured.	
22.	19 May	a) Jashpur, Raigarh (Chhatisgarh)		3 persons died.	
		b) Churu (Rajasthan)		2 persons died.	
23.	20 May	Nashik (Maharashtra)		One person died.	
24.	21 May	Kannur (Kerala)		2 women died and one person injured.	
25.	22 May	a) Nanded (Maharashtra)		i) One person died and other injured. ii) 7 cattle heads perished.	
		b) Salem (Tamil Nadu)		One person died.	
26.	24 May	a) Yavatmal (Maharashtra)		One person died.	
		b) Korba (Chattisgarh)		6 labors including 5 women died.	
27.	25 May	Alappuzha (Kerala)		One person injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
28.	28 May	Aurangabad and Parbhani (Maharashtra)		3 persons including a girl died.	
29.	30 May	Malda (West Bengal)		5 persons died.	
30.	1 Jun.	a) Bhandara (Maharashtra)		9 persons injured.	
		b) North 24 Parganas (West Bengal)		One person died.	
31.	6 Jun.	a) Sundergarh (Orissa)		i) One person died. ii) 5 cattle heads perished.	
		b) Azamgarh, Kushinagar and Lucknow (Uttar Pradesh)		7 persons died.	
32.	8 Jun.	South Tripura (Tripura)		4 wild bison in Trishna forest sanctuary died.	
33.	9 Jun.	Chandrapur, Nagpur and Yavatmal (Maharashtra)		4 persons died.	
34.	11 Jun.	Nagpur (Maharashtra)		One person died.	
35.	15 Jun.	Bhadrak (Orissa)		4 persons including a girl died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
36.	20 Jun.	East Nimar (Madhya Pradesh)		2 women injured.	
37.	23 Jun.	Burhanpur (Madhya Pradesh)		2 girls died and 2 other injured.	
38.	23 & 24 Jun.	Ernakulam and Thiruvananthapuram (Kerala)		One woman died and 4 other injured.	
39.	24 Jun	Nagpur (Maharashtra)		One woman died.	
40.	1 Jul.	Chandrapur, Nagour and Yavatmal (Maharashtra)		9 persons died and 10 injured.	
41.	2 Jul.	a) Sagar (Madhya Pradesh)		2 persons died and one injured.	
		b) Chandrapur and Yavatmal (Maharashtra)		7 persons died and 4 other injured.	
42.	3 Jul.	Sindhudurg (Maharashtra)		2 persons died.	
43.	4 Jul.	Amravati, Bhandara, Chandrapur, Nagpur and Yavatmal (Maharashtra)		i) 9 persons died and 5 injured. ii) One cattle perished.	
44.	5 Jul.	Mumbai (Maharashtra)		A woman died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
45.	6 Jul.	Bhandara and Wardha (Maharashtra)		5 persons died and 2 injured.	
46.	13 Jul.	Yavatmal (Maharashtra)		One woman died.	
47.	25 Jul.	Dhantala, Kulpi, Nadia and 24 Parganas (West Bengal)		4 persons died and 22 injured.	
48.	29 Jul.	Kanchipuram (Tamil Nadu)		One person died.	
49.	31 Jul.	Chandrapur, Gondia and Nagpur (Maharashtra)		9 persons died and 6 injured.	
50.	4 Aug.	Bardhaman (West Bengal)		9 persons died and 12 injured.	
51.	5 Aug.	South 24 Parganas (West Bengal)		One person died and 5 injured.	
52.	11 Aug.	Nagpur (Maharashtra)		One person died.	
53.	18 Aug.	Yavatmal (Maharashtra)		One person died.	
54.	19 Aug.	Gadchiroli (Maharashtra)		2 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
55.	23 Aug.	Amravati, Gadchoroli and Wardha (Maharashtra)		5 persons died and 20 other injured.	
56.	29 Aug.	Tikamgarh (Uttar Pradesh)		2 persons including a woman died.	
57.	1 Sept.	Wardha (Maharashtra)		2 persons died.	
58.	4&5 Sept.	Amravati, Nagpur (Maharashtra)		One person died and 6 injured.	
59.	13 Sept.	Thiruvannamalai (Tamil Nadu)		4 persons died.	
60.	17 Sept.	Tirunelveli (Tamil Nadu)		One person died.	
61.	22 Sept.	Mumbai (Maharashtra)		4 persons died and 3 injured.	
62.	28 Sept.	Karimnagar (Andhra Pradesh)		6 persons died and 5 injured.	
63.	12 Oct.	a) Tuticorin (Tamil Nadu)		One person died.	
		b) Idduki (Kerala)		2 persons died and 2 injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
64.	15 Oct.	Kottayam (Kerala)		An old woman died.	
65.	19 Oct.	Tirunelveli (Tamil Nadu)		2 persons died.	
66.	29 Oct.	Tiruchirapalli, Tuticorin and Virudunagar (Tamil Nadu)		3 persons died.	
67.	30 Oct.	Satara (Maharashtra)		One person died.	
68.	31 Oct	Puducherry (Union Territory)		One person died.	
69.	1 Nov.	Villupuram (Tamil Nadu)		5 persons died.	
70.	5 Nov.	Cuddalore, Madurai, Perambalur, Tuticorin and Virudunagar (Tamil Nadu)		5 persons died.	
71.	3 Dec.	Ariyalur (Tamil Nadu)		One person died.	

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

CRITERIA

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

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

1.	9 Mar.	Ranchi and surrounding area (Jharkhand)	Severe	<ul style="list-style-type: none"> i) One person died and another injured. ii) 2 cattle heads perished. 	
2.	19 Mar.	Sibsagar (Assam)	Moderate		<ul style="list-style-type: none"> i) Power supply and communication services disrupted. ii) Electric & telephone poles and trees uprooted. iii) Tin roofs of houses blown away and dwellings damaged.
3.	21 Mar.	Bilaspur, Kabirdham and Raipur (Chattisgarh)	Moderate		<ul style="list-style-type: none"> i) 150 houses damaged. ii) Many Trees uprooted. iii) High tension lines broken.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
4.	26 Mar.	Bongaigaon, Kamrup, Lakhimpur and Sonitpur (Assam)	Severe	2 persons died and 2 other injured.	i) Huge amount of standing crops damaged. ii) Electricity / telecommunication disrupted.
5.	27 & 28 Mar.	Wayanad (Kerala)	Moderate		About 2000 plantations damaged.
6.	29 Mar.	Kamrup (Assam)	Severe	A family of 6 persons injured.	i) 75 dwellings damaged. ii) Extensive damage to standing crops reported.
7.	31 Mar.	Morigaon (Assam)	Moderate	A family of 5 persons injured.	
8.	10 Apr.	Lakhimpur and Sonitpur (Assam)	Severe	7 persons injured.	i) Standing crops damaged. ii) Roofs of houses blown away. iii) Trees, electric/telephone poles uprooted.
9.	15 Apr.	Wayanad (Kerala)	Severe	2 persons injured.	i) About 1200 plantations damaged. ii) Many houses damaged.
10.	17 Apr.	Saiha (Mizoram)	Moderate		About 90 houses destroyed and 70 damaged.
11.	2 May	South Tripura (Tripura)	Moderate	One person died.	51 houses damaged.
12.	12 May	a) Birbhum and Howrah (West Bengal)	Severe	6 persons died.	
		b) Ranchi (Jharkhand)	Severe	3 persons died.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
13.	17 May	Ranchi (Jharkhand)	Severe	3 persons died.	
14.	18 May	Medinipur (West Bengal)	Severe	One person died.	i) Roofs of houses blown away. ii) Trees uprooted.
15.	19 & 20 May	Ranchi (Jharkhand)	Severe	5 persons died.	
16.	28 & 29 May	Ranchi (Jharkhand)	Severe	2 persons died.	
17.	31 May	Parts of Uttar Pradesh	Severe	10 persons died.	
18.	31 May-2 Jun.	Bhandara, Nagpur (Maharashtra)	Severe	3 children died and 2 persons injured.	i) Many houses collapsed ii) Many trees uprooted
19.	1 Jun.	a) Howrah and South 24 Parganas (West Bengal)	Severe	2 persons died and 11 other injured.	About 100 kutcha houses collapsed.
		b) Aurangabad, Gaya and Samastipur (Bihar)	Moderate	One person died.	Crops and many houses damaged.
20.	2 Jun.	Ranchi (Jharkhand)	Severe	One person died and 6 injured.	
21.	6 Jun.	Bahraich, Balrampur, Eastern UP, Gorakhpur, J.P.Nagar, Lakhimpur Kheri and Mau (Uttar Pradesh)	Severe	20 persons died.	i) Power supply disrupted. ii) Rail traffic affected.
22.	7 Jun.	Mandi (Himachal Pradesh)	Moderate		Leachy orchards damaged.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
23.	8 Jun.	a) Nagaon (Assam)	Moderate	16 cows perished.	
		b) Nagpur (Maharashtra)	Severe	One person died.	i) Many houses collapsed. ii) Many trees uprooted.
24.	13 Jun.	Dhubri (Assam)	Severe	One person died.	
25.	14 Jun.	(a) Dumka and Ranchi (Jharkhand)	Severe	3 persons died.	Many trees uprooted.
		(b) Murshidabad (West Bengal)	Severe	3 persons died and 7 injured.	
26.	20 & 21 Jun.	Nagaon (Assam)	Severe	3 persons died and 2 injured.	
27.	24 Jun.	Palamau (Jharkhand)	Severe	3 persons died and 7 injured.	
28.	27 Jun.	Ranchi (Jharkhand)	Severe	5 persons died.	
29.	29 Jun.	Begusarai, Munger, Patna and Siwan (Bihar)	Severe	14 persons died and 4 injured.	Many trees uprooted.
30.	30 Jun.	Ranchi (Jharkhand)	Severe	One person died and 2 injured.	
31.	14 Jul.	Golaghat and Sonitpur (Assam)	Severe	7 persons died and 8 injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
32.	24 Jul.	Patna (Bihar)	Severe	One person died and 6 injured.	
33.	25 Jul.	a) Nalbari (Assam)	Severe	One person died.	
		b) South 24 Parganas (West Bengal)	Moderate	6 persons injured.	31 kutcha houses destroyed.
34.	27 Jul.	Ranchi (Jharkhand)	Severe	One person died and 13 injured.	
35.	7 Aug.	Golaghat (Assam)	Severe	2 persons died and one injured.	
36.	10 & 11 Aug.	Jorhat & Kamrup (Assam)	Severe	3 persons died and one injured.	
37.	13 Aug.	a) Aurangabad, Nawada and Vaishali (Bihar)	Severe	6 persons died and 12 injured.	
		b) Dumka, Kodarma and Palamau (Jharkhand)	Severe	11 persons died.	
38.	17 & 18 Aug.	Araria, Jamui and Lakhisarai (Bihar)	Severe	17 persons died and 6 injured.	
39.	18 & 19 Aug.	Palamau and Ranchi (Jharkhand)	Severe	2 persons died and 5 injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
40.	21 Aug.	Ranchi (Jharkhand)	Severe	One person died.	
41.	26 Aug.	Ranchi (Jharkhand)	Severe	One person died.	
42.	30 Aug.	Ranchi (Jharkhand)	Severe	4 persons died.	
43.	1 Sept.	Garwah (Jharkhand)	Severe	12 cattle heads perished.	
44.	5 Sept.	Bankura (West Bengal)	Severe	2 persons died.	
45.	6 & 7 Sept.	Baska, Goalpara, Jorhat, Kamrup, Lakhimpur and Sibsagar (Assam)	Severe	i) 2 women and a child died, one woman injured. ii) 5 cattle heads perished.	i) More than 100 families badly affected. ii) Road traffic /telecommunication service disrupted.
46.	8 Sept.	South Tripura (Tripura)	Severe	5 persons seriously injured.	
47.	9 Sept.	a) Barpeta (Assam)	Severe	2 persons died and 2 injured.	
		b) Murshidabad (West Bengal)	Severe	2 persons died and 10 injured.	Many trees uprooted.
48.	10 Sept.	a) Dhubri (Assam)	Severe	One person died and one injured.	
		b) Champaram, Darbhanga, Madhubani and Nawada (Bihar)	Severe	3 persons died and many injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
49.	13 Sept.	Raichur (Karnataka)	Strong	One child died.	Roof of a house collapsed.
50.	14 Sept.	Gulbarga (Karnataka)	Severe	One girl died.	
51.	21 Sept.	North 24 Parganas (West Bengal)	Severe	2 persons died and 3 injured.	
52.	25 Sept.	Chatra (Jharkhand)	Severe	2 persons died.	
53.	3 Oct.	Kamrup (Assam)	Severe	4 persons died and 12 injured..	
54.	5 Oct.	Ranchi (Jharkhand)	Severe	One person died.	
55.	8 Oct.	Jamui and Lakhisarai (Bihar)	Severe	5 persons died.	
56.	17 Nov.	Ranchi (Jharkhand)	Severe	One person died and 3 injured.	

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
<p style="text-align: center;">TABLE – IX : HAILSTORM</p> <p style="text-align: center;">CRITERIA</p> <p style="text-align: center;">Slight : Sparse, usually small size and often mixed with rain.</p> <p style="text-align: center;">Moderate : Fall abundant enough to whiten ground.</p> <p style="text-align: center;">Heavy : Includes at least a proportion of large stones.</p>					
1.	10 Feb.	Amritsar, Bhatinda, Ludhiana and Patiala (Punjab)	Moderate		Damage to crops reported. .
2.	22 Feb.	Khurda (Orissa)	Heavy	One persons died	i) Houses in 20 villages damaged. ii) Telephone/Electric poles got snapped.
3.	14 Mar.	a) Dhar, Jhabua and West Nimar (Madhya Pradesh)	Moderate		Horticultural land, vegetables and orchards damaged
		b) Some districts of Vidarbha (Maharashtra)	Moderate		Mango, Orange and other crops damaged.
4.	16 Mar.	Nashik (Maharashtra)	Moderate		Extensive damage to grape orchards in 5000 acres causing a loss of Rs. 25 crores reported

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
5.	20 Mar.	a) Ajmer, Bhilwara, Bundi, Churu, Jalore, Jhalawar, Jhunjhunu, Kota, Pali, Rajasmand, Sikar, Sirohi and Udaipur (Rajasthan)	Moderate		Crops at many places damaged.
		b) Lucknow and adjoining areas (Uttar Pradesh)	Moderate		Mango and standing crops damaged.
6.	21 Mar.	Sangrur (Punjab)	Moderate		Wheat crop damaged.
7.	23 Mar.	Amaravati (Maharashtra)	Severe	3 persons died and one injured.	Heavy damage to crops reported
8.	24 & 25 Mar.	Alwar, Bharatpur and Sriganganagar (Rajasthan)	Moderate		Damage to crops reported..
9.	27 Mar.	Imphal (West), and Thoubal (Manipur)	Heavy		i) About 400 houses damaged.. ii) Heavy damage to crops reported.
10.	2 Apr.	Ferozpur (Punjab)	Heavy		Damage to 6500 acres of crops reported..
11.	6 Apr.	Panchkula and Yamuna Nagar (Haryana)	Moderate		Damage to wheat crops reported..

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
12.	13-14 May	Akola, Buldhana, Gadchiroli, Jalgaon, Nagpur, Nashik, Wardha and Yavatmal (Maharashtra)	Moderate		i) Extensive damage to orange, mango and pomegranate orchards in 200 acres reported. ii) Damage to banana plantation reported.
13.	15 May	Ranchi (Jharkhand)	Heavy	2 persons died and few injured.	i) Crops badly affected. ii) Asbestos roof tops badly affected.
14.	8 Oct.	Nashik (Maharashtra)	Heavy		2500 hectares of grape plantations damaged.
15.	17 Dec.	Dhule, Jalgaon, Nashik and Pune (Maharashtra)	Moderate	16 persons injured.	i) Hails of size bigger than lemon lashed many places. ii) Extensive damage to banana, gram, grape, pomegranate, sugarcane and wheat crop reported.

S.N.	Date/ Period	Area Affected	Intensity	Casualties	Extent of damage
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TABLE - X : DROUGHT

CRITERIA

Moderate : When seasonal (SW monsoon) rainfall departure is between -26% and -50%.

Severe : When seasonal (SW monsoon) rainfall departure is less than -50%.

S.N.	Area affected (Subdivision)	Seasonal rainfall departure (%)	Intensity
1.	Assam & Meghalaya	-30%	Moderate
2.	Bihar	-28%	Moderate
3.	East Uttar Pradesh	-38%	Moderate
4.	West Uttar Pradesh	-43%	Moderate
5.	Uttaranchal	-27%	Moderate
6.	Haryana, Chandigarh & New Delhi	-35%	Moderate
7.	Punjab	-34%	Moderate
8.	Himachal Pradesh	-34%	Moderate
9.	Jammu & Kashmir	-34%	Moderate
10.	West Rajasthan	-42%	Moderate
11.	East Rajasthan	-31%	Moderate
12.	West Madhya Pradesh	-27%	Moderate
13.	East Madhya Pradesh	-33%	Moderate
14.	Gujarat	-34%	Moderate
15.	Vidharbha	-32%	Moderate
16.	Chattisgarh	-34%	Moderate
17.	Telangana	-35%	Moderate

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

* As per data available from Central Water Commission, total damage for the whole season for entire state has been incorporated.

**STATES
ANDHRA PRADESH**

1.	Oct. 1 st week	Guntur, Krishna, Kurnool, Mahaboobnagar, and Prakasam	Flash flood (Krishna)	49 persons died.	i) A loss of Rs. 12,225 crores property reported. ii) 70,000 houses damaged and 4,00,000 people rendered homeless. iii) 500 villages inundated.
*	<i>Whole year</i>			i) 90 human lives lost. ii) 49686 cattle lost.	i) 1.751 million population affected. ii) 113769 houses damaged.

ASSAM

1.	20 Apr.	Lakhimpur	Flash Flood (Brahmaputra and its tributaries)		i) Extensive damage to standing crops reported. ii) Matmara embankment breached. iii) Many villages marooned.
2.	29 May	Dhubri and Sonitpur	Flash flood (Bhorali and Gangadhar)	9 persons died.	

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
3.	11 & 16 Jun.	Lakhimpur	Flash flood (Singra)	Cattle & poultry birds perished	i) About 15 villages inundated. ii) Huge amount of standing crops damaged. iii) The embankment of the river breached at 3-4 places. iv) Road communication disrupted
4.	27 Jun.	Lakhimpur and Dhemaji	Flood (Gainadi)	One person died.	i) About 60 villages inundated. ii) Extensive damage to standing paddy crops reported.
5.	2-6 Jul.	Barpeta, Bongaigaon, Jorhat, Karbi-Anglong, Lakhimpur and Nagaon	Flash flood (Brahmaputra and its tributaries)		i) 1.5 lakh people affected. ii) 30,000 hectares of crop land and huge amount of crop damaged.
6.	10-11 Jul.	Morigaon and Sibsagar	Flash flood (Brahmaputra and Deshang)	2 children drowned.	i) About 50,000 people and 32 villages affected. ii) Water logged in Sibsagar- Najira- Jorhat road. iii) Damage to paddy crops reported.
7.	29 Jul.	Barpeta and Sonitpur	Flash flood (Kaldia)		i) About 26 villages inundated. ii) 1000 hectares of crop land inundated.
8.	5 Aug.	Sonitpur	Flood (Sopai and Bisakata)		i) About 500 houses marooned. ii) Standing crops damaged.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
9.	12 & 13 Aug.	Dhemaji, Lakhimpur and Sonitpur	Flash flood (Brahmaputra and its tributaries)	2 persons swept away.	i) 1.5 lakh people affected. ii) N.H. 52 breached at three places between Dhemaji and Lakhimpur. iii) Arunachal link road affected. iv) Extensive damage to standing crops reported.
10.	16 Aug.	Barpeta, Bongaigaon, Dhemaji, Karbi-Anglong, Lakhimpur and Sonitpur	Flash flood (Darika and Tiak)	4 persons died.	Some hectares of crop land damaged.
11.	23 & 24 Aug.	Dhemaji and Jorhat	Flood (Brahmaputra)		i) Borbill and Puthi river embankments breached. ii) Total 28,400 hectares crop land of 57 villages affected. iii) Standing crops damaged.
12.	16-19 Sep.	Dhemaji	Flood (Jiadhal-Kumotia and Samarajan)		i) A large area of agriculture land washed off. ii) About 64 villages flooded. iii) Road links disrupted. iv) Huge amount of crops damaged.
13.	8 Oct.	Lakhimpur	Flash flood (Boka and Singra)		i) Crop land in vast area damaged. ii) Several villages inundated.
*	Whole year			i) 8 human lives lost. ii) 12 cattle lost.	i) 0.370 million population affected. ii) 240 houses damaged. iii) Crops in 0.030 m. ha. affected.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
BIHAR					
1.	1 Sep,	Darbhanga, Madhubani, Muzaffarpur, Kishanganj, and Supaul.	Heavy rains	39 persons died.	
*	<i>Whole year</i>			i) 97 human lives lost. ii) 2 cattle lost.	i) 1.836 million population affected. ii) 7007 houses damaged. iii) Crops in 0.084 m. ha. affected.
CHHATTISGARH					
*	<i>Whole year</i>			i) 5 human lives lost. ii) 3 cattle lost.	i) 0.056 million population affected. ii) 1321 houses damaged.
GOA					
*	<i>Whole year</i>			One human lives lost.	206 houses damaged.
GUJARAT					
1.	1-21 July	Most of the districts	Heavy rains	i) 51 persons died. ii) 308 cattle perished.	553 houses fully and 5330 houses partially damaged causes a loss of about Rs. 135.57 lakhs .
2.	1-31 Aug.	Junagarh, Mahesana, Panchmahal, Rajkot and Sabarkantha.	Heavy rains	i) 11 persons died. ii) 14 cattle heads perished.	221 houses fully and 6279 houses partially damaged which causes a loss of about Rs. 1 lakh .

S. N.	Date/ Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
3.	Oct. 1 st week	Bharuch, Surat, The Dangs, Vadodara and Valsad	Heavy rains	12 persons died.	
*	Whole year			i) 94 human lives lost. ii) 456 cattle lost.	i) 0.634 million population affected. ii) 12641 houses damaged.
HARYANA					
1.	11 & 12 Sep.	Ambala, Bhiwani, Hisar, Karnal, Jind, Panchkula, Panipat, Rewari and Sonipat.	Heavy rains	6 persons died.	i) Breaches in Kotbilla bridge and about a 30 ft. breach in embankment of Tangri river. ii) 100 acres of land submerged. iii) 600 acres of cropland submerged in Jind.
*	Whole year			i) 9 human lives lost. ii) 16 cattle lost.	i) 2216 houses damaged. ii) Crops in 0.008 m. ha. affected.
HIMACHAL PRADESH					
1.	7 Aug.	Mandi	Moderate flood (cloud burst)	i) 2 persons died. ii) Some cattle perished.	Some cow sheds, shops and buses washed away.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
JAMMU & KASHMIR					
1.	14 Jul.	Doda	Cloud burst	One person died.	
KARNATAKA					
1.	18 May	Chikmagalur	Heavy rains		Bydgi crops damaged.
2.	22 & 23 May	Bengaluru Urban	Heavy rains	One woman died.	
3.	11-15 Jun.	Bengaluru	Heavy rains	3 persons washed away.	
4.	3-8 Jul.	Dakshina Kannada, Mangalore, Shimoga and Udupi.	Heavy rains	11 persons washed away.	32 houses washed away in Udupi.
5.	16 Jul.	Dakshina Kannada, Dharwad and Mysore.	Heavy rains	13 persons died.	
6.	5 Sep.	Chikmagalur, Raichur and Gulbarga	Flood (Bhadra)	3 persons washed away.	
7.	13-15 Sep.	Bengaluru, Gulbarga and Raichur	Heavy rains	4 persons died and 2 children washed away.	
8.	18 Sep.	Bengaluru	Heavy rains	4 persons washed away.	
9.	22 & 23 Sep.	Chitradurga, Davanagere and Raichur	Heavy rains	5 persons died and one person washed away.	

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
10.	29 Sep.	Gulbarga	Heavy rains	3 girls washed away.	
11.	29 Sep to 3 Oct.	11 districts of North Karnataka and 10 districts of North Interior Karnataka.	Heavy rains	308 persons died.	4,069 houses collapsed and 11,488 houses damaged.
12.	Oct. 1 st week	15 districts of Karnataka	Flash flood (Krishna, Ghatprabha and Malprabha)	195 persons died.	i) Crops in 25000 hectares of area damaged. ii) 2,40,000 houses damaged causing Rs. 16,500 crores loss.
*	Whole year			i) 396 human lives lost. ii) 9043 cattle lost.	i) 0.217 million population affected. ii) 500001 houses damaged. iii) Crops in 0.137 m. ha. affected.
KERALA					
1.	26 May	Alappuzha, Kollam, Kottayam and Thiruvananthapuram	Heavy rains	One girl washed away.	4 houses completely and 115 houses partially damaged.
2.	5 Jul.	Kozhikode, Thrissur and Wayanad	Heavy rains	5 persons died.	
3.	11 & 12 Jul.	Wayanad	Heavy rains		i) About 600 plantations destroyed. ii) Landslide reported.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
4.	15-18 Jul.	Alappuzha, Ernakulam, Idukki, Kannur, Kasaragode, Kollam, Kozhiokode, Pathanamthitta, Thrissur and Thiruvananthapuram.	Heavy rains	33 persons died.	i) 363 houses completely and 811 partially damaged. ii) In 666 hectares of cropland a loss of about Rs.10 crores reported.
5.	20-22 Jul.	Wayanad	Heavy rains	i) 7 persons died and 10 persons injured. ii) 17 cattle washed away.	i) Landslide reported in 14 places. ii) 316 houses completely and 3991 houses partially damaged. iii) Extensive damage to agriculture reported. iv) In 1372 hectares of land a total loss of Rs. 44 crores reported.
6.	18 Sep.	Kottayam	Heavy rains	One person died.	
7.	3 Oct.	Alappuzha, Ernakulam, Kollam, Kozhiokode, Malappuram, Pathanamthitta, Thrissur and Thiruvananthapuram.	Heavy rains		i) 112 houses completely and 539 houses partially damaged. ii) Landslide reported. iii) About 3,000 acres of paddy fields flooded. iv) Lossof around 1.5 crores of rupees reported. v) Extensive damage to Agriculture reported.
8.	7-8 Nov.	Idukki, Palakkad and Thiruvananthapuram.	Heavy rains	i) One person died. ii) Many cattle heads washed away.	i) Landslide reported. ii) 21 houses collapsed and 80 partially damaged. iii) Damage to standing crops reported.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
9.	27-29 Dec.	Wayanad	Heavy rains		Extensive damage to paddy crops, coffee plantations and vegetables reported.
*	Whole year			i) 142 human lives lost. ii) 166 cattle lost.	i) 1.223 million population affected. ii) 22744 houses damaged. iii) Crops in 0.026 m. ha. affected.
MADHYA PRADESH					
1.	23 Jul.	Chindwada, Indore, Mandsaur, Narsingpur, Sagar	Heavy rains	28 persons died.	
*	Whole year			i) 56 human lives lost. ii) 148 cattle lost.	11356 houses damaged.
MAHARASHTRA					
1.	13 Feb.	Satara	Heavy rains		Extensive damage to strawberry fields reported.
2.	14 May	Wardha	Heavy rains	i) One person died. ii) 3 cattle heads perished.	Roofs of the houses blown away.
3.	18 & 20 May	Aurangabad, Dhule and Satara	Heavy rains	3 persons died.	i) Damage to Banana and Pomegranate orchards reported. ii) 93 houses damaged.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
4.	24-29 Jun.	Mumbai, Nagpur and Yavatmal	Heavy rains	3 persons died and 7 other injured.	Damage to the crops and property reported.
5.	3-8 Jul.	Amravati, Mumbai and Nashik	Heavy rains	12 persons died.	
6.	14 & 15 Jul.	Mumbai, Gadchiroli and Nagpur	Heavy rains	10 persons died and 8 other injured.	Two buildings collapsed.
7.	30 Aug.	Amravati	Heavy rains	2 women died.	
8.	5 Sep.	Mumbai	Heavy rains	11 persons died.	Landslide reported.
9.	20 Sep.	Satara	Heavy rains	One person died.	Heavy damage to Jowar, Soyabean and Sugarcane crops reported.
10.	1-6 Oct.	Ahmadnagar, Kolhapur, Raigad, Ratnagiri, Sangli, Sindhudurg and Solapur	Heavy rains	i) 34 persons died ii) 67 cattle heads perished.	i) 583 houses completely and 4749 partially damaged. ii) Crops in 1,28,772 hectares of land damaged causing a loss of about 1.5 crores.
11.	30 Oct.	Beed and Satara	Heavy rains	2 girls died.	Extensive damage to Soya crop over 500 acres of land reported.
12.	11 Nov.	Ratnagiri and Sindhudurg	Heavy rains	10 persons died and 62 missing.	Extensive damage to crops reported.
13.	12 Nov.	Satara	Heavy rains	One person died and 50 others injured.	i) 15 houses damaged. ii) Damage to jowar, groundnut, strawberry and grapes reported.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
14.	18 Nov.	Sangli	Flood (Yerala)		Sugarcane worth Rs. 25 lakhs washed away.
*	Whole year			38 human lives lost.	
MEGHALAYA					
1.	10 Oct.	Shillong	Heavy rains	4 persons died and 15 others missing.	
MIZORAM					
1.	7 Oct.	Aizawal	Heavy rains	3 persons died and 10 others injured.	Landslide reported.
ORISSA					
1.	14-30 Jul.	Parts of Bhadrak, Cuttack Ganjam, Kalahandi, Kandhamal, Kendrapara, Keonjhar, Koraput, Khurda, Jaipur, Nayagarh, Puri, and Sundargarh	Flood (Mahanadi)	56 persons died.	870 houses fully and 11677 houses partially damaged.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
2.	7-11 Sep.	Balasore	Heavy rains		i) About 1.16 lakhs of people affected. ii) Extensive damage to 0.05 lakhs of hectare, agricultural land affected.
*	Whole year			59 human lives lost.	i) 0.500 million population affected. ii) 12547 houses damaged. iii) Crops in 0.131 m. ha. affected.
PUNJAB					
1.	27 Mar.	Fatehgarh Sahib and Patiala	Heavy rains		A large portion of wheat crop damaged.
2.	16 Jul.	Mansa	Heavy rains		Paddy crops in thousand of acres of land damaged.
3.	22 Jul.	Gurdaspur	Heavy rains		Chakkipul bridge joining Punjab and Himachal Pradesh washed away.
4.	28 Jul.	Hoshiarpur	Heavy rains	2 persons died.	i) Hundred acres of land submerged. ii) Extreme damage to public and private property reported.
5.	5 Aug.	Gurdaspur	Heavy rains	One person died.	
6.	4 Oct.	Faridkot	Heavy rains		Bridge adjoining Mirapur dam washed away.
*	Whole year			8 human lives lost.	i) 72 houses damaged. ii) Crops in 0.005 m. ha. affected.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
RAJASTHAN					
1.	9-11 Sep.	Alwar, Bharatpur and Kota	Heavy rains	6 persons and a child died.	24 kutcha houses swept away.
*	<i>Whole year</i>			i) 48 human lives lost. ii) 3509 cattle lost.	221 houses damaged.
TAMIL NADU					
1.	16 Sep.	Vellore	Heavy rains	5 persons died.	
2.	25 Sep.	Thiruvannamalai	Heavy rains	2 persons died.	
3.	6-11 Nov.	The Nilgiris and Kanniyakumari Thiruvallur, Thiruvarur and Tirunelveli	Heavy rains	49 persons died.	i) Paddy cultivation in 30,000-40,000 acres submerged. ii) 700 houses completely damaged. iii) Land slide reported in The Nilgiris.
4.	16 Nov.	Dharamapuri, Kanniyakumari, The Nilgiris and Thiruvallur	Heavy rains	5 persons died.	330 houses damaged.
*	<i>Whole year</i>			i) 19 human lives lost. ii) 32 cattle lost.	1106 houses damaged.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
UTTAR PRADESH / UTTARAKHAND					
1.	30 Jun.	Deoria, Gonda, Jaunpur and Pratapgarh	Heavy rains	8 persons died.	
2.	28 Jul.	Pauri Garhwal	Heavy rains	6 persons died.	Landslide reported.
3.	31 Aug.	Bahraich and Gonda	Flash flood (Baghamati)	3 persons died.	
4.	8 Aug.	Pithoragarh	Severe Flood (Cloud burst)	i) About 43 persons died. ii) About 100 cattle heads perished.	i) About 12 houses trapped under debris. ii) Landslide reported.
5.	19-24 Aug.	Bahraich, Ballia, Gonda and Lakhimpur Kheri	Flood (Ghaghra)	25 persons died.	i) Mailani-Gonda railway line affected. ii) Many villages inundated.
6.	26 Aug.	Bahraich, Balarampur, Faizabad, Gonda, Lakhimpur Kheri, Pilibhit and Sitapur	Heavy rains	8 persons died.	
7.	28 Aug.	Gonda	Flood (Ganga)	2 persons died.	
8.	11&12 Sept.	Bahraich, Barabanki, Hardoi and Unnao	Heavy Rains	16 persons died	

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
9.	6 & 7 Oct.	Barabanki, Chitrakoot, Fatehpur, Gonda, Hathras, Kanpur, Lakhimpur Kheri, Sitapur and Unnao	Heavy rains	24 persons died and several injured.	
10.	9 Oct.	Bahraich, Balarampur and Gonda	Heavy rains	8 persons died.	
UTTAR PRADESH					
*	Whole year			i) 254 human lives lost. ii) 101 cattle lost.	i) 1.835 million population affected. ii) 2893 houses damaged. iii) Crops in 0.461 m. ha. affected.
UTTARAKHAND					
*	Whole year			i) 87 human lives lost. ii) 362 cattle lost.	412 houses damaged.
WEST BENGAL					
1.	26 May	Darjeeling	Heavy rains	28 persons died.	Land slides reported.
2.	20 Aug.	Darjeeling, Jalpaiguri, Coochbehar, Malda, S. Dinajpur	Heavy rains	5 persons died	i) Hundreds of houses damaged. ii) More than 10,000 people affected.

S. N.	Date/Period	Area affected	Intensity [River(s)]	Casualties	Extent of damage
3.	5-10 Sept.	Bankura, Bardhaman, Birbhum, East & West Midnapore, Howrah and 24 Parganas	Heavy rains	7 persons died.	i) 17 lakh people of about 11 villages marooned. ii) About 4,000 people shifted to safer places. iii) 14,000 houses fully/partially damaged. iv) 37,500 people were shifted to safer places . v) Large area of standing crops damaged.
*	<i>Whole year</i>			i) 127 human lives lost. ii) 68 cattle lost.	i) 2.948 million population affected. ii) 244725 houses damaged. iii) Crops in 0.121 m. ha. affected.
UNION TERRITORY					
NEW DELHI					
1.	29 Jul.	New Delhi	Heavy rains	2 persons died.	
PUDUCHERRY					
*	<i>Whole year</i>			7 cattle lost.	i) 0.002 million population affected. ii) 13 houses damaged.

S.N.	Date/Period	Area affected	Intensity	Casualties	Extent of damage
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TABLE – XII : CYCLONIC STORM

During 2009, four cyclonic storms were formed over the Arabian Sea/Bay of Bengal. Out of these only two crossed the Indian Coast and caused some damage, details of the same are out lined below:-

BAY CYCLONE

1.	23-26 May.	<p>Formation Near Lat. 16.5°N/Long. 88.0°E at 0600 UTC of 23rd.</p> <p>Landfall It crossed close to the Sagar Islands and lay centred at 1200 UTC of 25th and further weakened into Depression near Lat. 27.0° N/Long. 88.5°E at 0600 UTC of 26th</p> <p>Dissipation Over Sub Himalayan West Bengal & Sikkim and neighbourhood on 26th itself.</p>	Severe Cyclonic Storm (AILA)	100 human lives lost in West Bengal.	<p>In West Bengal :- i) 2.2 million people affected. ii) 61,000 houses collapsed and 1,32,000 houses partially damaged.</p> <p>In Orissa :- 1000 acres of crop land affected.</p>
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S.N.	Date/Period	Area affected	Intensity	Casualties	Extent of damage
ARABIAN SEA CYCLONE					
2.	9-12 Nov	<p><u>Formation</u> Near Lat.15.0°N/ Long.71.0°E (about 300 km. west southwest of Goa at 1800 UTC of 10th.</p> <p><u>Landfall</u> It crossed Maharastra Coast between Alibag and Mumbai and further Weakened into Deep Depression about 100 Kms northeast of Mumbai at 1200 UTC of 11th.</p> <p><u>Dissipation</u> Over Sothwest Madhya Pradesh and adjoining north Madhya Maharashtra at 0300 UTC of 12th</p>	Cyclonic Storm (PHYAN)	In Maharashtra, 44 fishermen missing.	<p>In Maharashtra :-</p> <p>i) Thousands of houses partially damaged.</p> <p>ii) Damage to Grape, Cotton, Mango and Cashew farms worth crores of rupees reported.</p>