

**GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
LOK SABHA  
UNSTARRED QUESTION NO. 188  
TO BE ANSWERED ON WEDNESDAY, 7<sup>TH</sup> DECEMBER, 2022**

**EXTREME WEATHER EVENTS**

188. **SHRI RAJIV PRATAP RUDY:**

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether it is a fact that India recorded extreme weather events such as heatwaves, cold waves, cyclones, lightning, heavy rainfall and landslides in the current year;
- (b) if so, the number of extreme weather events that have been recorded in the past year, State/UT/district-wise;
- (c) whether the Government has data regarding the number of deaths that have been caused, including those of children and women, due to extreme weather events;
- (d) if so, the details thereof, State/UT/district-wise including the district of Saran in Bihar;
- (e) whether the Government has carried out any study on the total economic loss that has occurred due to extreme weather events of the past year, if so, the details thereof State/UT-wise;
- (f) whether the Government has devised any other policies to minimize the human and economic loss due to extreme weather events in India; and
- (g) if so, the details thereof and if not, the reasons therefor?

**ANSWER**

**THE MINISTER OF STATE (INDEPENDENT CHARGE) FOR  
MINISTRY OF SCIENCE AND TECHNOLOGY  
AND EARTH SCIENCES  
(DR. JITENDRA SINGH)**

- (a)-(b) Yes Sir. The extreme weather events such as heatwaves, cold waves, cyclones, lightning, heavy rainfall and landslides recorded during 2021 and 2022 are given in the Annexure-I.
- (c)-(d) The details of the state wise information of loss of lives due to various disastrous weather events which happened in the last decade in the country as a whole is given in the table in Annexure-II.
- (e) IMD has an effective forecast and dissemination mechanism through which necessary warnings and advisories are issued for various extreme weather events throughout the country well in advance for preparedness. However, estimation of economic loss is the mandate under the respective State/UT Governments. This ministry doesn't centrally archive such data.
- (f)-(g) IMD issue forecasts and warnings related to extreme weather events and share the same with Disaster Management Authorities as well as general public through various platforms for necessary preparedness and to support mitigation measures.

IMD follows a seamless forecasting strategy. The long-range forecasts (for the whole season) issued are being followed with extended range forecast issued on every Thursday with a validity period of four weeks. To follow up the extended range forecast, IMD issues short to medium range forecast and warnings daily valid up to next five days with an outlook for subsequent two days. The short to medium range forecast and warning at district and station level are issued by state level Meteorological Centres (MCs)/Regional Meteorological Centres (RMCs) with a validity of next five days and are updated twice a day. The short to medium range forecast is followed by very short range forecast of severe weather up to three hours (nowcast) for all the districts and 1171 cities and towns. These nowcasts are updated every three hours.

Forecast is issued for 36 meteorological sub-divisions from National Weather Forecasting Centre, IMD HQ and is updated four times a day. The forecasts and nowcasts are issued at District Level and Station Level by State Level Meteorological Centres and Regional Meteorological Centres.

IMD is implementing Impact Based Forecast (IBF) which gives details of what the weather will do rather than what the weather will be. It contains the details of impacts expected from the severe weather elements and guidelines to general public about do's and don'ts while getting exposed to severe weather. These guidelines are finalised in collaboration with National Disaster Management Authority (NDMA) and is already implemented successfully for cyclone, heat wave, thunderstorm and heavy rainfall.

While issuing the warning suitable colour code is used to bring out the impact of the severe weather expected and to signal the Disaster Management about the course of action to be taken with respect to impending disaster weather event. Green color corresponds to no warning hence no action is needed, yellow color corresponds to be watchful and get updated information, orange color to be alert and be prepared to take action whereas red color signals to take action.

The forecasts and warnings are disseminated to users including disaster managers by e-mail on regular basis. In addition to this, WhatsApp groups are created including disaster managers and IMD officials and forecast & warnings are disseminated through this facility also. The forecast & Warnings are uploaded in social media & website for reference by all concerned. The nowcasts related to Severe Weathers are disseminated through SMS also to the registered users.

In addition to this, as and when the situation arises, Press Releases are issued by IMD and the same are also disseminated by all the platforms mentioned above.

IMD has taken various initiatives in recent years for improvement in dissemination of weather forecast and warning services based on latest tools and technologies. In 2020, IMD has launched seven of its services (Current Weather, Nowcast, City Forecast, Rainfall Information, Tourism Forecast, Warnings and Cyclone) with '**UMANG**' mobile App for use by public. Moreover, in 2020, IMD had developed mobile App '**MAUSAM**' for weather forecasting, '**Meghdoot**' for Agromet advisory dissemination and '**Damini**' for lightning alert.

## Annexure-I

### Count of Natural Event during 2022

Natural Events	Number of Events	
	2021	2022
COLD WAVE	5	1
DUST STORM	5	1
GALE	1	8
HEAT WAVE	4	27
LIGHTNING	5	566
SNOWFALL	393	7
SQUALL	9	1
THUNDERSTORM	45	240

### Heavy rainfall count during monsoon season 2021 and 2022

YEAR	2021			2022		
	Heavy Rainfall (>64.4 mm &< 115.4mm )	Very Heavy Rainfall ( >115.5 mm &< 204.4mm)	Extremely Heavy Rainfall >204.4m	Heavy Rainfall (>64.4 mm &< 115.4mm )	Very Heavy Rainfall (>115.5 mm &< 204.4mm)	Extremely Heavy Rainfall >204.4mm
JUN	1295	277	35	939	237	80
JUL	2236	638	121	2843	829	131
AUG	1209	272	28	2154	577	63
SEP	1689	466	97	1326	232	22
monsoon	6429	1653	281	7262	1875	296

### Cyclonic disturbances over North Indian Ocean in last two years:

Yearly and Monthly Frequency of Cyclones and Depressions													
Period : 2020-2021													
Basin : Bay of Bengal (BOB) and Arabian Sea (AS)													
Intensity(Level) : Cyclonic Storm (CS) and Severe Cyclonic Storm (SCS)													
Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
2021	0	0	0	0	2	0	0	0	2	0	0	1	5
2022	0	0	0	0	1	0	0	0	0	1	0		2
<b>Total</b>	0	0	0	0	3	0	0	0	2	1	0	1	7

**State wise heat waves (HW) reported during 2021 and 2022**

Average No. of HW days during April to Jun for 2021-2022			
State / UT	No of stations used for study	2021	2022
Andhra Pradesh	7	4	5
Assam	2	0	0
Bihar	3	1	6
Chhattisgarh	2	1	6
Delhi	1	3	17
Gujarat	7	0	5
Haryana	2	2	24
Himachal Pradesh	1	0	0
Jharkhand	3	0	18
Karnataka	11	0	0
Madhya Pradesh	8	1	13
Maharashtra	11	0	4
Odisha	5	4	5
Punjab	2	2	24
Rajasthan	10	4	26
Tamil Nadu	5	3	3
Telangana	2	0	2
Uttar Pradesh	8	1	15
Uttarakhand	1	7	28
West Bengal	4	3	2

## Annexure-II

<b>CASUALTIES / DEATHS DUE TO DISASTROUS WEATHER EVENTS FOR THE YEAR 2009- NOV.2022</b>												
	<i>1</i>	<i>2</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>8</i>	<i>9</i>	<i>10</i>	<i>11</i>	
<i>YEAR</i>	<i>SNO W FAL L</i>	<i>CO LD WA VE</i>	<i>HEA T WAV E</i>	<i>SQ UA LL</i>	<i>GALE</i>	<i>DUS T STO RM</i>	<i>LIG HTN ING</i>	<i>THU NDE R STOR M</i>	<i>HAI L STO RM</i>	<i>FLOODS AND HEAVY RAINS</i>	<i>CYCLO NIC STORM</i>	<i>TOTAL (WHOL E YEAR)</i>
2022	37	1	30	1	10	22	907	371	0	804	0	2183
2021	12	5	0	0	4	5	640	26	1	700	172	1565
2020	22	162	11	6	12	14	270	594	0	758	115	1964
2019	65	291	505	3	6	25	415	348	2	1297	60	3017
2018	18	280	33	0	8	237	342	572	8	1099	157	2754
2017	38	51	375	15	10	5	834	287	4	1075	46	2740
2016	22	42	510	8	3	11	670	216	28	714	34	2258
2015	12	18	2081	1	5	30	498	324	39	917	94	4019
2014	62	58	547	9	3	51	352	246	35	953	46	2362
2013	30	271	1433	1	3	1	326	327	54	5528	50	8024
2012	31	139	729	5	5	5	434	190	0	395	61	1994
2011	14	722	12	0	4	21	177	331	0	654	46	1981
2010	25	450	269	0	3	41	431	373	45	1058	22	2717
2009	11	79	216	23	5	8	238	182	6	1227	100	2095

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