GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. - 4025
ANSWERED ON – 07/04/2022

DEATHS DUE TO EXTREME WEATHER EVENTS

4025. SMT. PHULO DEVI NETAM:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) actions that are being taken to build resilience against extreme weather given that data from the Indian Meteorological Department reveals that the highest number of extreme weather events were recorded in the last five years;
(b) reasons for central Indian States accounting for the most number of extreme weather related deaths in 2021;
(c) number of deaths due to extreme weather events, State-wise and year-wise from 2017 till date;
(d) whether Government plans to implement immediate and long term policy changes to address the impact of climate change on weather, especially in central Indian States; and
(e) if so, the details thereof?

ANSWER
THE MINISTER OF STATE (INDEPENDENT CHARGE) OF MINSTRY OF SCIENCE AND TECHNOLOGY AND EARTH SCIENCES
(DR. JITENDRA SINGH)

(a) India Meteorological Department (IMD) issues various outlook/forecast/warning at various time and spatial scales for Public as well as Disaster Management Authorities for the preparedness of extreme weather events. India is now having one of the best dynamical prediction systems for supporting early warning. IMD has developed capability for generating real time forecasts and warnings in all spatial scales from a location to Block, district, meteorological subdivisions and homogeneous regions and temporal scales of a few hours (nowcast), 3 days (short range forecast), 4-7 days (medium range forecast) 1-4 weeks (extended range forecast) and one month to a season (long range forecast).

Recently IMD brought out "Climate Hazard & Vulnerability Atlas of India" prepared for the thirteen most hazardous meteorological events, which cause extensive damages, economic, human, and animal losses. The same can be accessed at https://imdpune.gov.in/hazardatlas/abouthazard.html. This atlas helps IMD as a reference to issue impact-based forecast for various extreme weather events.

The climate Hazard and vulnerability atlas will help state government authorities and Disaster Management Agencies for planning and taking appropriate action to tackle various extreme weather events. These information are used as reference for weather and climate services extended by the Department.

(b) Central Indian States fall in the Core Monsoon Zone where the maximum number of rainy days occur normally during the monsoon season. Also, the monsoon rain bearing systems such as low pressure area and depressions move through these states (west-northwestwards along the monsoon trough region) and provide copious rainfall, which often lead to flood like situations.

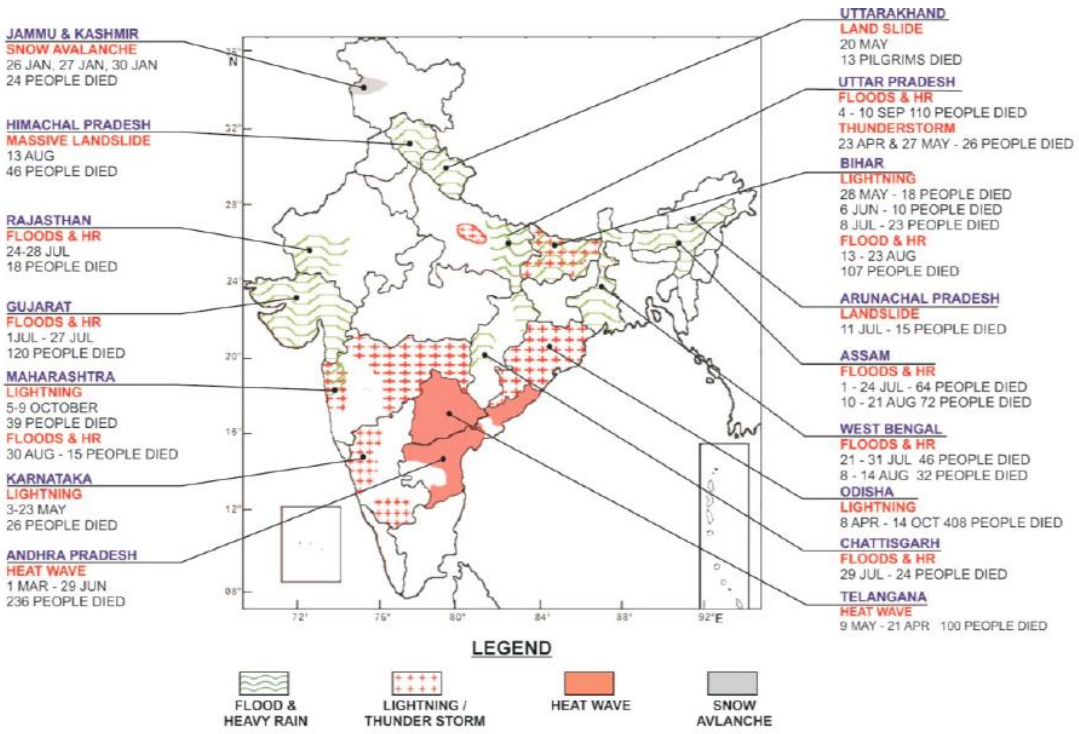
(c) Number of deaths due to extreme weather events, State-wise and year-wise from 2017 till 2021 are given in Annexure.

(d)–(e) Ministry of Earth Sciences (MoES) has established a Centre for Climate Change Research (CCCR) at the Indian Institute of Tropical Meteorology (IITM), Pune. The centre is dedicated to carry out research on global and regional climate change with a particular focus on the Indian climate and the monsoons. CCCR has started the coupled climate modelling, and based on the efforts, an Indian Climate specific Earth System Model (ESM) has been developed which is contributing to the Intergovernmental Panel on Climate Change (IPCC) 6thAssessment (IPCC-AR6). Currently efforts are on going to generate the climate change scenarios.

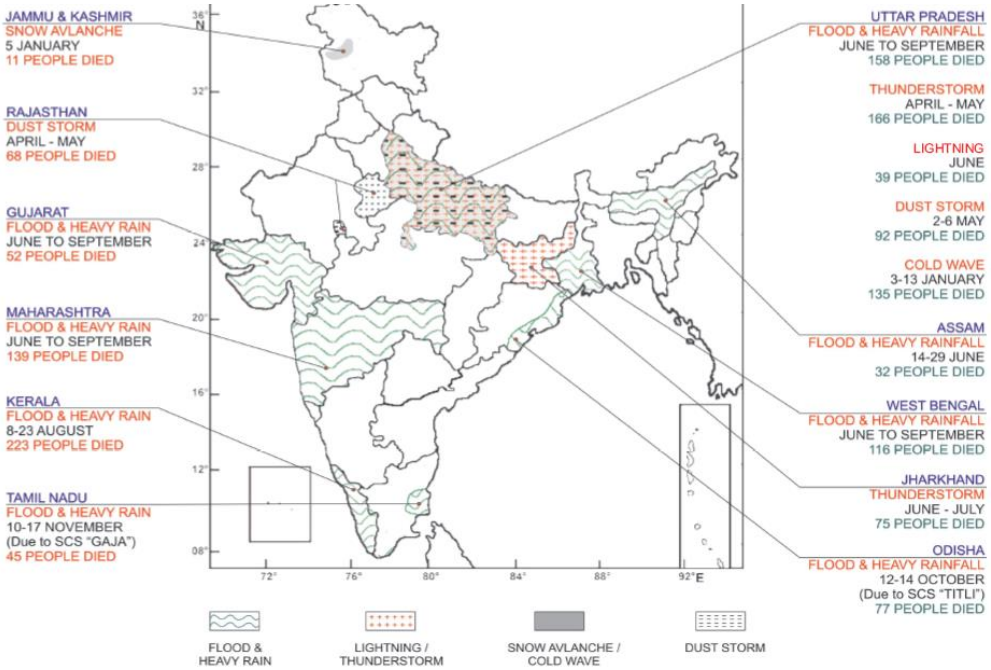
Recently, MoES has published "Assessment of Climate Change over Indian Region" recently. This report prepared by the CCCR, contains the details of observed changes in our climate system and future projections of climate change based on observations and climate model simulations. The assessment report provides a detailed overview and synthesis of the published scientific literature on climate change over India and adjoining regions. While the Intergovernmental Panel on Climate Change (IPCC) assessment reports published every 6–7 years, largely provide a global perspective on climate change, the focus on regional climate change aspects is considerably limited. Therefore, this report fills this gap by discussing the past climate and regional climate change projections over the Indian subcontinent based on the climate models. The future projections of climate change are based on different scenarios as prescribed by IPCC.

Annexure

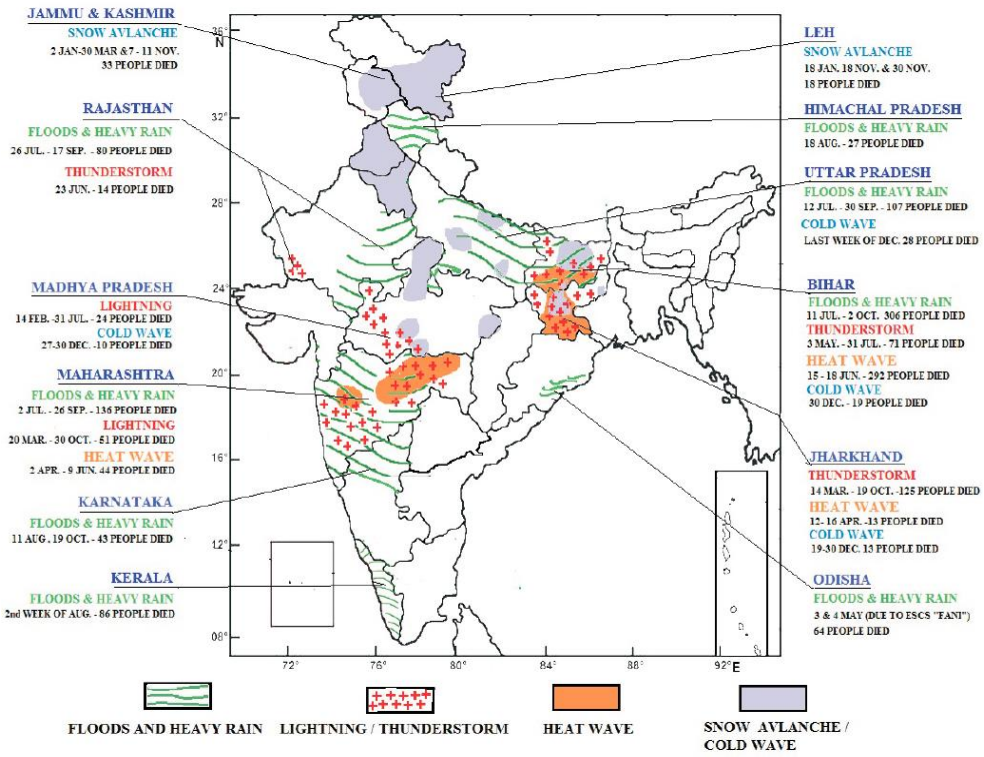
Number of deaths due to extreme weather events, State-wise and year-wise from 2017-21



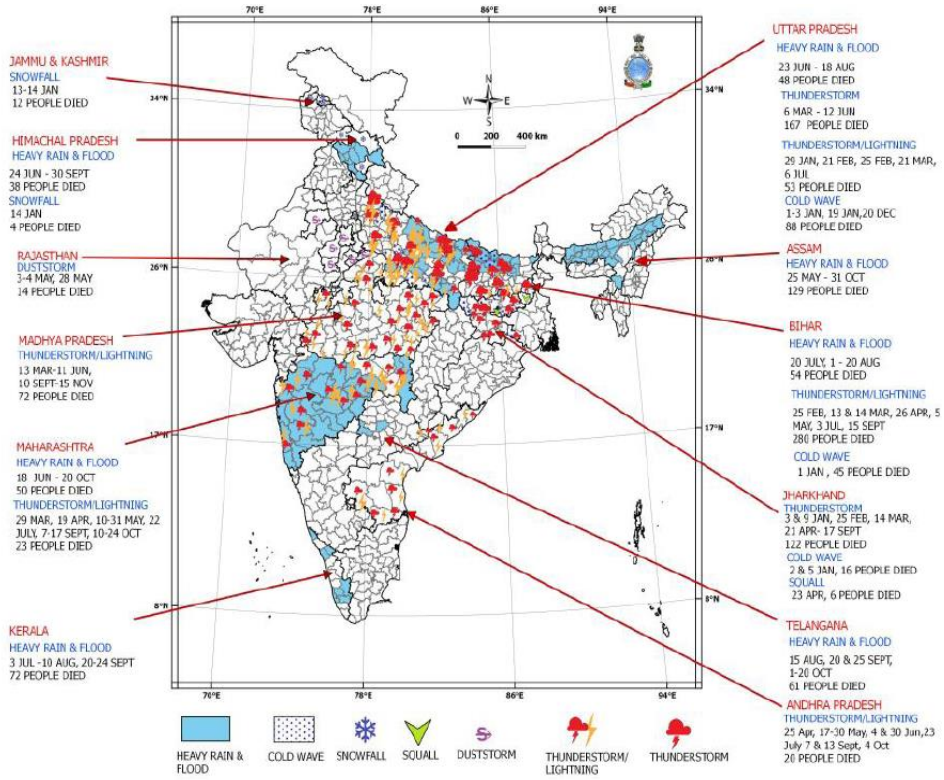
For the year 2017



For the year 2018



For the year 2019



For the year 2020

Table 1: Extreme Weather Events during 2021 along with associated loss of humanLives

Sum of Deaths	Extreme Weather Events and loss of Lives				
State / UT	**Cyclones**	**FLOODS, HEAVY RAINS & Land Slides**	**LIGTNING & THUNDERSTORM**	**OTHER EVENTS**	**STATEWISE TOTAL**
Andhra Pradesh	4 (CS GULAB-24 to 28 Sep.)	46 (6 Sep.; 8 to 21 Nov.)			**50**
Assam		14			**14**
Bihar	1 (VSCS YAAS-23 to 28 May)	12	89 (12 May ; 23 to 28 Jun.; 30 Jul.; 7 Aug.; 2, 27 Sep.; 1, 2, 17, 19 Oct.)		**102**
Chhattisgarh			3		**3**
Goa	3 (ESCS TAUKTAE-14 to 19 May)				**3**
Gujarat	79 (ESCS TAUKTAE-14 to 19 May)	7	6		**92**
Haryana			1		**1**
Himachal Pradesh		55 (12, 25, 27 Jul.; 11 Aug.)		4	**59**
Jammu & Kashmir		21	4	7	**32**
Jharkhand	3 (VSCS YAAS-23 to 28 May)		54 (9, 20, 26, 31 May; 1, 2 Jun.; 2, 11, 19 Jul.; 2, 7, 29 Aug.)		**57**
Karnataka	8 (ESCS TAUKTAE-14 to 19 May)	33	4		**45**
Kerala	9 (ESCS TAUKTAE-14 to 19 May)	53 (23 to 25 May; 14 & 15 Jul.; 11 to 19 Oct.; 10 to 15 Nov.)	5		**67**
Madhya Pradesh		34	156 (2, 3 Jan.; 16, 18 Feb.; 12 to 23 Mar.;10, 11 Apr.; 2 to 30 May; 5, 6 Jun.; 11 to 13, 23, 24 Jul.;2, 17, 18, 22 to 31 Aug.; 4 to 29 Sep.; 1, 2, 3, 17, 18 Oct.)	1	**191**
Maharashtra	45 + 11 = 56 (ESCS TAUKTAE-14 to 19 May) (CS GULAB-24 to 28 Sep.)	215 (3, 9 Jun.; 9 to 31 Jul.; 29 to 31 Aug.; 1, 6, 7, 20, 21, 28 Sep., 6 & 9 Oct.)	76 (18 Feb.; 20 Mar.; 10, 11 Apr.;2 to 9, 18, 29, 30, 31 May;3 to 9, 28 Jun.; 7, 9. 11, 22 Jul.; 10, 20, 21, 27 Sep.; 1, 5, 6, 7, 9 Oct.)	3	**350**
Odisha	3 + 1 = 4 (VSCS YAAS-23 to 28 May) (CS GULAB-24 to 28 Sep.)	3	213 (12 Jan.; 4 to 29 Apr.; 4 to 31 May; 1 to 30, Jun.; 1 to 25 Jul.; 2 to 31 Aug.; 1 to 29 Sep.)	3	**223**
Rajasthan		14	48 (12, 22, 23 Mar. ; 11, 13, 14 Jul.; 31 Aug.; 2, 6, 7, 21, 22, 28 Sep.; 18 Oct.)		**62**
Sikkim		2			**2**
Tamil Nadu		20	14		**34**
Telangana	3 (CS GULAB-24 to 28 Sep.)	15	7		**25**
New Delhi		4		3	**7**
Uttar Pradesh		42	49 (21 Apr.; 11 Jul.; 14 & 22 Sep.)	7	**98**
Uttarkhand		143 (7 Feb. 2021; 23 Apr.; 11 Jul.; 29 Aug.; 16 to 19 Oct.)		4	**147**
West Bengal	2 (VSCS YAAS-23 to 28 May)	26	58 (11, 25, 27 May; 5, 7, 8, 10, 13 Jun.; 2, 7 Aug.; 26 Sep.)		**86**
Total	**172**	**759**	**787**	**32**	**1750**

- **Other Events: COLD WAVE + DUST STORM + GALE + HAILSTORM + SNOWFALL**

- **CS: Cyclonic Storm, SCS: Severe Cyclonic Storm, VSCS: Very Severe Cyclonic Storm, ESCS: Extremely Severe Cyclonic Storm**

For the year 2021

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