GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
LOK SABHA
UNSTARRED QUESTION NO. 2554
TO BE ANSWERED ON WEDNESDAY, 7TH AUGUST, 2024

UNUSUAL HEAVY RAINFALL

†2554. SHRI SATPAL BRAHAMCHARI:

Will the Minister of EARTH SCIENCES be pleased to state:

(a)   whether the Government has proposed/is proposing to conduct a study on unusual heavy rainfall during the last five years;

(b)   if so, the details thereof and if not, the reasons therefor;

(c)   the details of the deaths caused by heavy rainfall in the country during each of the last five years, year, State and district-wise; and

(d)   whether the emerging technologies like Artificial Intelligence (AI) is used/being used to improve weather forecasting in the country at present, if so, the details thereof, State/district-wise?

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

(a)   Yes.

(b)   The India Meteorological Department (IMD) has classified heavy rainfall events into three major categories (heavy rainfall: 64.5 mm to 115.5 mm, very heavy rainfall: 115.6 mm to 204.4 mm, extremely heavy rainfall: 204.5 mm and above).

IMD routinely analyzed all heavy rainfall events observed nationwide, and the causes are published as the weekly, monthly, and monsoon season end reports (https://imdpune.gov.in/reports.php). At the end of each year, the Annual Climate Summary (https://www.imdpune.gov.in/cmpg/Product/acs.html) summarizes all significant events.

Also, IMD analysed the changing rainfall pattern in the country and extremes in the recent 30 years at different spatial scales (States and Districts). A total of 29 reports on "Observed Rainfall Variability and Changes" for various States/UTs were published by IMD in January 2020, and it is available at the following (https://www.imdpune.gov.in/Reports/rainfall%20variability%20page/raintrend%20new.html).

(c)	The latest details are given in Annexure-1 as per the National Crime Record Bureau (NCRB), Ministry of Home Affairs (MHA).

(d)	Yes. Artificial intelligence (AI) is being used to improve weather, climate, and ocean forecasting skills for the entire country, at various institutes under the ministry. Some of these works include:

- Improvement of the short-range precipitation forecast in 1-day, 2-day, and 3-day lead times with a reduction in bias
- Development of high-resolution (300 meters) urban gridded meteorological datasets for temperature and precipitation
- Development of the time-varying Normalized Difference Urbanization Index with a spatial resolution of 30 meters from 1992-2023
- Development of very high-resolution precipitation datasets for verification purposes

Deaths due to Heavy Rains during 2018-2022:

S. No.	State/UT	2018	2019	2020	2021	2022
	Torrential Rains					
1	ANDHRA PRADESH	0	0	7	0	0
2	ARUNACHAL PRADESH	0	0	0	0	0
3	ASSAM	0	0	1	0	1
4	BIHAR	59	13	1	5	0
5	CHHATTISGARH	0	0	0	0	3
6	GOA	0	0	0	1	0
7	GUJARAT	0	1	0	0	2
8	HARYANA	0	0	0	0	0
9	HIMACHAL PRADESH	16	1	0	0	2
10	JAMMU & KASHMIR	0	0			
11	JHARKHAND	8	3	10	12	1
12	KARNATAKA	3	6	2	10	12
13	KERALA	5	2	0	0	0
14	MADHYA PRADESH	1	1	1	0	2
15	MAHARASHTRA	3	5	5	8	2
16	MANIPUR	0	0	0	0	0
17	MEGHALAYA	0	0	6	0	0
18	MIZORAM	0	0	0	0	0
19	NAGALAND	0	0	0	0	0
20	ODISHA	0	0	0	0	0
21	PUNJAB	0	0	0	0	0
22	RAJASTHAN	0	3	3	9	3
23	SIKKIM	0	0	0	0	1
24	TAMIL NADU	0	5	1	2	0
25	TELANGANA	0	0	0	0	0
26	TRIPURA	0	4	0	0	0
27	UTTAR PRADESH	3	17	0	0	31
28	UTTARAKHAND	3	7	0	16	14
29	WEST BENGAL	0	1	0	0	0
	TOTAL (STATES)	101	69	37	63	74
	UNION TERRITORIES					
30	A & N ISLANDS	0	0	0	0	0

31	CHANDIGARH	0	0	0	0	0
32	D & N HAVELI	0	0	5	0	0
33	DAMAN & DIU	0	0	1	0	0
34	DELHI (UT)	0	0	0	0	15
35	JAMMU & KASHMIR			0	0	0
36	LAKSHADWEEP	0	0	0	0	0
37	PUDUCHERRY	0	0	0	0	0
	TOTAL (UTs)	0	0	6	0	15
	TOTAL (ALL INDIA)	101	69	43	63	89

Source: National Crime Record Bureau (NCRB), Ministry of Home Affairs (MHA)

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