

GOVERNMENT OF INDIA  
MINISTRY OF EARTH SCIENCES  
**RAJYA SABHA**  
**UNSTARRED QUESTION NO. 361**  
ANSWERED ON 25/07/2024

**STUDY ON ABNORMAL HEAVY RAINS**

361. DR. KANIMOZHI NVN SOMU:  
SHRI M. MOHAMED ABDULLA:

Will the Minister of EARTH SCIENCES be pleased to state:

- (a) whether Central Government has come up with any plan to study the abnormal heavy rains in the last decade;
- (b) if so, the details thereof and if not, the reasons therefor; and
- (c) the details of annual deaths resulting from heavy rains in the country during the last five years, year-wise and State-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). The State-wise data of heavy rainfall events in terms of their frequency of occurrence for each category in the last decade are given in Annexure-1.

IMD routinely analyzed all heavy rainfall events observed nationwide in the last decade. The characteristics of all these events, associated weather systems, and causes are published weekly, monthly, and in monsoon season (southwest & northeast) end reports (<https://imdpune.gov.in/reports.php>). It is also further documented in detail within the seasonal summary and published regularly in the peer-reviewed journal "Mausam" (<https://mausamjournal.imd.gov.in/index.php/MAUSAM>). At the end of each year, the Annual Climate Summary (<https://www.imdpune.gov.in/cmpg/Product/acs.html>) summarizes all significant events.

To understand trends of total rainfall in monthly and seasonal time scales and increasing frequencies of heavy rainfall events, IMD analysed the changing rainfall pattern in the country and its extremes in the recent 30 years at different spatial scales covering 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. Reports are available on the IMD Pune website (<https://www.imdpune.gov.in/Reports/rainfall%20variability%20page/raintrend%20new.html>).

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

## Annexure-1

The State-wise number of rainfall events since 2014 is given in the tables below:

S. No.	State Name	2014			2015			2016			2017		
		HV	VH	XH	HV	VH	XH	HV	VH	XH	HV	VH	XH
1	Andhra Pradesh	852	197	46	1326	327	45	1097	179	9	846	84	1
2	Arunachal Pradesh	99	29	2	97	22	6	106	29	3	5	3	0
3	Assam	386	73	14	360	96	11	346	54	8	64	15	4
4	Bihar	1362	331	26	933	240	23	1291	177	13	1154	307	47
5	Gujarat	513	195	37	437	172	49	416	89	17	560	173	53
6	Haryana	42	7	1	105	14	2	62	10	1	95	20	1
7	Himachal Pradesh	210	36	4	223	60	4	161	48	4	190	59	0
8	Jammu & Kashmir	48	17	3	78	13	0	22	6	0	45	7	0
9	Karnataka	2783	815	111	1712	409	52	1706	401	32	2219	411	34
10	Kerala	576	94	2	360	43	1	225	23	1	360	38	2
11	Madhya Pradesh	545	160	23	640	196	44	483	141	26	254	48	4
12	Maharashtra	857	323	34	678	207	26	1298	378	53	993	333	44
13	Manipur	13	3	0	11	2	0	17	1	1	2	0	0
14	Meghalaya	121	51	68	124	73	56	94	64	48	54	20	7
15	Mizoram	79	8	0	21	4	0	23	2	0			
16	Nagaland	25	4	0	23	4	0	35	0	0	27	2	0
17	Orrisa	1651	478	109	920	259	44	1046	146	6	1118	189	19
18	Punjab	40	11	1	77	22	2	57	16	0	83	13	0
19	Rajasthan	391	93	17	425	103	22	580	145	32	387	74	28
20	Tamilnadu	763	107	9	920	216	71	432	56	9	1079	211	17
21	Tripura	107	21	3	122	11	1	107	23	0	149	32	1
22	Union Territory	28	16	4	36	17	1	34	12	2	50	18	4
23	Uttar Pradesh	166	29	3	255	55	1	372	94	5	347	80	4
24	West Bengal	501	154	20	633	189	26	587	216	32	649	197	49
25	Indian Islands	46	16	2	44	10	0	49	13	3	55	12	1
28	Sikkim	98	18	2	55	7	0	40	5	0	49	5	0
29	Jharkhand	529	101	7	576	96	9	721	133	9	594	139	16
30	Uttaranchal	167	41	8	197	29	4	185	38	9	133	35	1
31	Chhattisgarh	252	79	11	228	44	4	235	50	6	153	23	1
32	Goa	136	48	2	72	30	0	122	25	0	81	15	2
33	Delhi	6	0	0	27	2	0	6	1	0	10	0	0
34	Telangana	433	71	6	536	90	6	849	175	13	212	35	0

S. No.	State Name	2018			2019			2020			2021		
		HV	VH	XH	HV	VH	XH	HV	VH	XH	HV	VH	XH
1	Andhra Pradesh	807	112	11	327	70	5	520	122	5	478	87	9
2	Arunachal Pradesh	67	8	0	99	22	0	111	35	5	83	14	0
3	Assam	319	71	5	387	98	12	445	115	16	286	41	2
4	Bihar	831	170	10	1508	497	81	1802	383	31	2045	391	41
5	Gujarat	440	162	34	806	276	75	835	197	42	634	174	18
6	Haryana	90	20	1	45	14	0	81	13	0	149	41	4
7	Himachal Pradesh	259	101	12	213	41	10	129	24	2	145	28	3
8	Jammu & Kashmir	36	11	0				38	8	0	35	7	1
9	Karnataka	788	227	43	908	300	60	925	274	41	873	188	23
10	Kerala	607	163	32	528	117	33	484	110	8	567	113	11
11	Madhya Pradesh	359	85	10	1062	244	25	368	105	26	533	115	22
12	Maharashtra	879	334	38	1405	516	110	1017	269	27	1138	401	87
13	Manipur	4	0	0	3	1	0	12	1	0	8	0	0
14	Meghalaya	69	26	20	142	80	54	180	121	113	156	54	44
15	Mizoram	22	2	1	21	2	1	17	2	0	21	2	0
16	Nagaland	35	4	0	25	2	0	22	1	0	22	1	1
17	Orrisa	1844	530	142	1836	541	73	1473	466	44	1088	310	109
18	Punjab	117	29	4	95	25	5	52	9	0	82	21	0
19	Rajasthan	394	80	4	711	169	18	363	69	10	461	119	13
20	Tamilnadu	907	200	26	1045	204	38	1183	246	51	1579	311	37
21	Tripura	105	24	8	118	25	3	105	21	0	77	18	0
22	Union Territory	36	15	1	36	27	11	51	11	4	58	20	8
23	Uttar Pradesh	437	109	15	489	125	16	358	80	9	689	169	28
24	West Bengal	443	143	31	412	123	30	552	151	41	516	179	37
25	Indian Islands	47	8	2	74	17	4	32	14	0	67	15	1
28	Sikkim	61	7	3	40	7	3	64	6	2	54	11	0
29	Jharkhand	331	34	2	454	51	7	379	27	2	613	162	29
30	Uttaranchal	179	39	5	147	25	2	178	26	2	239	77	17
31	Chhattisgarh	213	48	4	283	65	8	411	106	18	317	28	0
32	Goa	76	21	2	191	65	9	206	70	1	134	67	3
33	Delhi	15	3	0	2	0	0	22	4	0	64	12	0
34	Telangana	292	52	10	406	50	3	710	144	10	760	177	19

S. No.	State Name	2022			2023		
		HV	VH	XH	HV	VH	XH
1	Andhra Pradesh	399	52	5	300	70	13
2	Arunachal Pradesh	140	27	7	92	9	1
3	Assam	504	136	32	353	82	9
4	Bihar	778	109	4	952	260	43
5	Gujarat	663	204	54	635	264	49
6	Haryana	123	26	1	122	30	10
7	Himachal Pradesh	195	27	6	292	130	12
8	Jammu & Kashmir	59	12	0	37	5	3
9	Karnataka	1217	286	19	539	157	18
10	Kerala	449	69	5	419	79	3
11	Madhya Pradesh	921	239	27	653	197	43
12	Maharashtra	1245	368	28	1073	301	25
13	Manipur	24	2	0	4	1	0
14	Meghalaya	218	127	101	187	97	38
15	Mizoram	11	2	0	36	2	0
16	Nagaland	45	3	0	50	6	0
17	Orrisa	1364	268	24	1169	246	38
18	Punjab	117	17	0	88	32	7
19	Rajasthan	518	107	12	360	74	37
20	Tamilnadu	813	141	14	703	147	42
21	Tripura	57	12	0	64	15	1
22	Union Territory	69	29	8	62	26	9
23	Uttar Pradesh	458	127	25	435	107	22
24	West Bengal	411	119	16	530	153	22
25	Indian Islands	60	16	0	51	17	4
28	Sikkim	58	12	0	45	7	2
29	Jharkhand	346	45	1	166	25	0
30	Uttaranchal	283	66	4	198	41	8
31	Chhattisgarh	338	82	5	322	57	3
32	Goa	127	37	3	151	49	0
33	Delhi	27	1	0	25	6	0
34	Telangana	770	211	37	641	146	37

Heavy Rainfall (HV) = 64.5 mm to 115.5 mm  
Very Heavy Rainfall (VH) = 115.6 mm to 204.4 mm  
Extremely Heavy Rainfall (XH)= 204.5 mm and above

## Deaths due to Heavy Rains during 2018-2022:

Torrential Rain						
S. No.	State/UT	2018	2019	2020	2021	2022
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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