GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION No. - 974
ANSWERED ON 15/12/2022

RISE IN HEAT WAVES

974. SHRI N.R. ELANGO:

Will the Minister of EARTH SCIENCES be pleased to state:

(a) whether Government has taken note that a sharp rise in the number of heat waves in the country is due to the increasing impact of climate change; and
(b) if so, the details of the preventive steps taken/proposed to be taken by Government keeping in view the fact that the number of people killed due to heat waves has increased from 5457 over 1981-1990 to 11555 over 2011-2020?

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

(a) Yes Sir. The trend in heatwave over the country during summer season based on the data for the period from 1961 to 2021 is given in Annexure-I. The details of state-wise average number of Severe Heatwave/heatwave days in the country in the last 10 years is given Annexure-II.

(b) Heat wave is one of the severe weather phenomena for which IMD issues early warning. In the country, appreciable rise in maximum temperatures as well as heat waves are found to be more in the months of April, May & June. As an initiative IMD is issuing Seasonal Outlook for temperatures for the months of April, May & June in the last week of March for planning purpose, since 2016.This outlook bring out the expected scenario of heat waves also during the period.

The seasonal outlook is followed by Extended Range Outlook issued on every Thursday for next two weeks. In addition to this, the forecast and the colour coded warnings for severe weather including heat wave warning are issued on daily basis for next five days with outlook for another two days.

IMD has started Forecast Demonstration Project (FDP) on heat waves under which a detailed daily report including realized data of heat waves, weather systems leading to the occurrence of heat waves, diagnosis on the basis of Numerical Model outputs and forecast and warnings for five days is prepared. This bulletin is disseminated to all concerned including health departments. IMD started issuing an additional bulletin on heat wave in the morning (8 a.m.) valid for 24 hours for supporting the planning of activities for the day and this bulletin is also disseminated to all concerned. All these bulletins are posted to IMD website also, on a special page created for Heatwaves.

As an adaptive measure, IMD in collaboration with local health departments have started heat action plan in many parts of the country to forewarn about the heat waves and also advising action to be taken during such occasions. Heat action plan became operational since 2013.

The Heat Action Plan is a comprehensive early warning system and preparedness plan for extreme heat events. The plan presents immediate as well as longer-term actions to increase preparedness, information-sharing, and response coordination to reduce the health impacts of extreme heat on vulnerable populations. NDMA and IMD are working with 23 states prone to high temperatures leading to heat-wave conditions to develop heat action plans.

Recent advancement made in Heat wave forecast and warning follow:-

- Heat Wave Monitoring and Forecasting Information on GIS
- Issue special heat wave & its impact bulletin (March to June) at 1600 hrs IST by including impact of Minimum Temperature, humidity and wind.
- Heat Wave hazard analysis for entire country for four hot weather months (MARCH, APRIL, MAY & JUNE) considering the Maximum Temperature, Minimum Temperature, Humidity, Wind and Duration is completed. This will lead to identification of hazard scores based on different meteorological parameters aggravating impact of Heat Waves. These scores could in future be utilized as threshold to generate Heat Wave impact based alerts for the specific locations.

The link for Heat Wave information web-page is
https://internal.imd.gov.in/pages/heatwave_mausam.php

Recently IMD brought out web based online "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**. 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.

Annexure-I

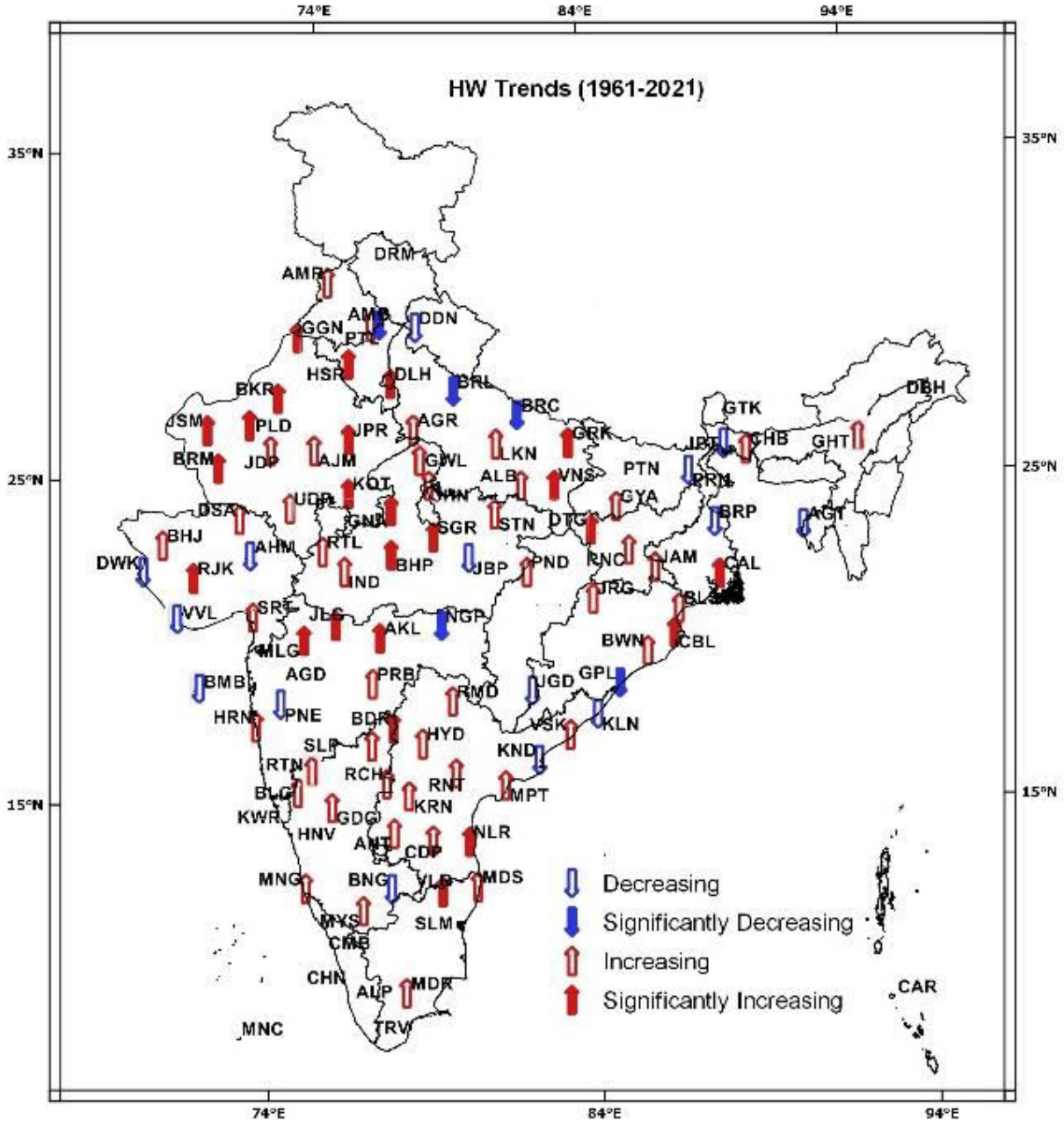

Figure. Trend in the Heat Wave (HW) days of 103 stations during April, May and June for the period 1961–2021. Red rising (blue falling) arrows represent the increasing (decreasing) trends. Filled arrows represent the trends significant at 5% level. Nonparametric Mann–Kendall test was used to test the significance of the trends.

Annexure-II

State-wise Average number of Heat Wave days reported in the recent 10 years.

S. No.	State / UT	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
1	Andhra Pradesh	8	16	11	16	7	10	10	8	13	3	4
2	Assam	0	0	0	0	0	0	0	0	0	0	0
3	Bihar	1	20	1	9	5	11	3	6	12	1	1
4	Chhattisgarh	1	6	3	6	1	2	3	0	3	0	1
5	Delhi	1	11	7	7	3	2	9	6	8	4	3
6	Gujarat	1	1	1	3	2	3	4	3	4	2	0
7	Haryana	3	8	8	9	4	10	13	9	8	3	2
8	Himachal Pradesh	0	0	0	0	0	0	0	0	0	0	0
9	Jharkhand	1	19	5	7	9	16	10	3	10	1	0
10	Karnataka	0	2	1	1	2	3	0	0	2	4	0
11	Kerala	-	-	-	-	-	-	-	-	-	-	-
12	Madhya Pradesh	2	4	5	10	4	10	7	7	13	2	1
13	Maharashtra	1	3	8	5	5	8	6	8	15	5	0
14	Mizoram	-	-	-	-	-	-	-	-	-	-	-
15	Odisha	2	18	9	17	11	19	9	4	8	2	4
16	Punjab	6	17	11	12	3	5	12	4	8	1	2
17	Rajasthan	7	7	9	11	9	15	14	17	20	6	4
18	Tamil Nadu	3	10	4	5	3	3	8	2	11	4	3
19	Telangana	0	9	6	2	7	14	5	0	10	2	0
20	Uttar Pradesh	2	17	6	9	8	5	4	6	13	2	1
21	Uttarakhand	0	27	2	3	2	9	4	5	13	0	7
22	West Bengal	1	6	3	12	1	5	2	2	3	0	3

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