GOVERNMENT OF INDIA
MINISTRY OF EARTH SCIENCES
RAJYA SABHA
UNSTARRED QUESTION NO. 353
ANSWERED ON 06/02/2025

IMPACT OF FREQUENT HEATWAVES

353. SHRI DEBASHISH SAMANTARAY:

Will the Minister of **EARTH SCIENCES** be pleased to state:

(a) whether Odisha ranks among the States in the country experiencing prolonged heatwaves, particularly for five consecutive days or more, in the last five years, and the reasons for such occurrences;
(b) whether Government has assessed the impact of frequent heatwaves on public health, agriculture and the environment; and
(c) the measures taken by Government to mitigate long-term temperature rise and reduce the frequency of heatwaves in the country?

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

(a) Yes. During the last five years, Odisha has ranked among the States in India that have experienced prolonged heatwaves, particularly for five consecutive days or more. The details are provided in the Annexure-1. The heatwave incidents were mainly observed in June 2023 and April, May & June months of 2024. The main reasons for the persistent heatwaves are:

- The persistence of anticyclonic circulation over the State with dry North Northwesterly/Westerly winds causes heat advection over the area.

- The delayed setting up of sea breeze over coastal regions due to prevailing dry low-level Northwesterly/Westerly winds. On many occasions, besides the delayed onset of sea breeze, the weakening of sea breeze is also noted due to the impact of such westerly warmer continental winds.

(b) In general, there is an increasing trend in the frequency of heatwaves in the heat core zone covering northern plains and central India, as per the analysis done by the India Meteorological Department (IMD). Recently, IMD published a monograph on heatwaves that provides comprehensive information on heatwaves over India (https://mausam.imd.gov.in/responsive/met2.php).

IMD has recently brought out a web-based online "Climate Hazard & Vulnerability Atlas of India" prepared for the thirteen most hazardous meteorological events, which cause extensive damages and economic, human, and animal losses. The climate hazard and vulnerability atlas will help State Government authorities and disaster management agencies plan and take appropriate action to tackle various extreme weather events, including heatwaves.

Studies have been conducted case-to-case for different scenarios by different academic and research institutions. It has the following impact on human health:

- During severe heatwave spells, very high likelihood of developing heat illness and heat stroke in all ages. Extreme care is needed for vulnerable people.
- High temperature & increased likelihood of heat illness symptoms in people who are either exposed to sun for a prolonged period or doing heavy work.
- High health concern for vulnerable people, e.g., infants, elderly, people with chronic diseases.
- Moderate temperature & heat are tolerable for the general Public, but moderate health concerns are likely for vulnerable people, e.g., infants, the elderly, and people with chronic diseases.

Further, heatwaves adversely affected crop output in the previous year, especially certain vegetables in various regions, which put pressure on food inflation. The Government took timely steps to bring relief to the common man. These, inter alia, include strengthening of buffer stock of essential food items and periodic open market releases, subsidised retail sale of items like rice, wheat flour, and pulses in specified outlets, easing imports of essential food items through rationalisation of duties, prevention of hoarding through imposition/revision and monitoring of stock limits. The Pradhan Mantri Garib Kalyan Anna Yojana largely protects the vulnerable sections from price pressures in food grains.

Also, the Ministry of Earth Sciences (MoES) has published a Climate Change report titled "Assessment of Climate Change over the Indian Region". The report has assessed the impact of climate change across the country, covering all aspects of regional climate change, including the climatic extremes across India.

(c) Due to climate change, annual temperature is increasing globally, and the impact of the same is reflected in the rising frequency and intensity of heatwaves in various parts of the globe, including India. Intergovernmental Panel on Climate Change (IPCC)-Sixth Assessment Report also reflects the same (https://www.ipcc.ch/report/ar6/syr/downloads/report/IPCC_AR6_SYR_SPM.pdf). Addressing the root causes of global climate change is essential to mitigate the impact of heat waves. This involves international cooperation to reduce carbon emissions, transition to renewable energy sources, and implement sustainable practices across all sectors. Various initiatives have been undertaken by the Government of India with the help of States to reduce the causes of heatwaves in the coming years. National Action Plan on Climate Change (NAPCC) and State Action Plan on Climate Change (SAPCC) is one of the major initiatives in this direction. Additionally, India has taken a proactive role in fostering international collaborations through initiatives such as the International Solar Alliance and the Coalition for Disaster-Resilient Infrastructure. India is committed to pursuing low-carbon strategies for development and is actively pursuing them, as per national circumstances.

The India Meteorological Department, in coordination with various research centers across the country, has taken multiple steps to improve monitoring and early warning systems, which helped minimize loss of life and property during extreme weather events, including heat waves. These include:

- Issuing seasonal and monthly outlooks, followed by extended-range forecasts of temperature and heatwave conditions. The early warning and forecast information are also disseminated through various social media for timely public outreach.
- District-wise heatwave vulnerability Atlas over India to help State Government authorities and disaster management agencies in planning
- The hot weather hazard analysis map over India that includes daily temperature, winds, and humidity condition
- Heat Action Plans (HAPs) in 23 States that are prone to heatwave conditions jointly implemented by the National Disaster Management Authority (NDMA) in collaboration with the State Governments
- A series of National and State-level heatwave preparedness meetings are conducted much before the start of the summer season, with regular review meetings from time to time during the season.

IMD has launched seven of its services (Current Weather, Nowcast, City Forecast, Rainfall Information, Tourism Forecast, Warnings, and Cyclone) with the 'UMANG' Mobile App for use by the Public. Moreover, IMD developed a mobile App, 'MAUSAM' for weather forecasting, 'Meghdoot' for Agromet advisory dissemination, and 'Damini' for lightning alerts. The common Alert Protocol (CAP) developed by the NDMA is also being implemented to disseminate warnings by the IMD.

Annexure-1

Year	No. of heatwave days (length of longest spell)	No. of heatwave spells of >= 5 days
2020	-	-
2021	5 (3)	-
2022	1 (1)	-
2023	20 (14)	2
2024	37 (18)	3

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