EXPLAINED CLIMATE

Bracing for extended heatwaves

IMD has said this summer will be extremely warm, and have above-normal heatwave days, which can have severe impacts. Although several states have heat action plans, their implementation is inadequate

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THIS SUMMER is likely to be extremely warm. In its latest forecast for the coming months, the India Meteorological Department (IMD) has predicted an "above-normal number of heatwave days" over most parts of the country.

The forecast is in line with the general trend of summer heat becoming more intense, and heatwaves occurring with greater frequency. This has implications for people's health, particularly that of poor and vulnerable groups, and has economic impacts, including income loss.

Unlike some other consequences of climate change, the impacts of heatwaves can be largely managed, if timely actions are initiated. Several states, and cities, have prepared heat action plans to deal with heatwaves and soften their impact on the people. However, several reports have pointed out in recent years that their implementation has not been adequate.

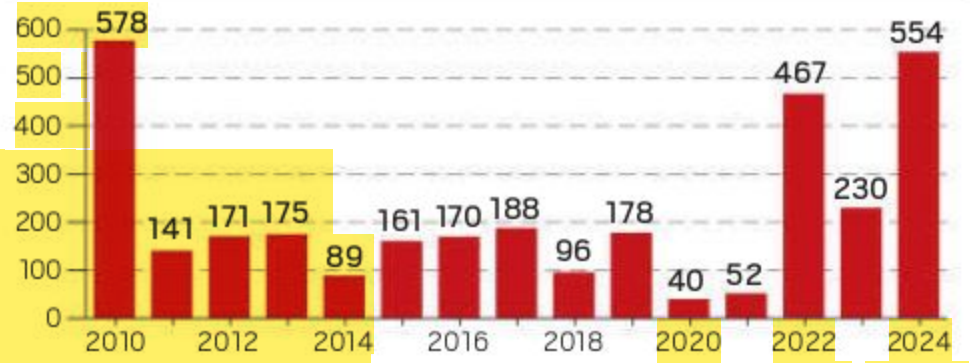
The forecast

The IMD has said during the April to June summer season, "above normal" heatwave days are expected in practically the entire northern, central and eastern India. The extreme south, the northeastern region, Jammu & Kashmir, and Himachal Pradesh are the only regions that might escape exceptional heat this summer.

The 'normal' number of heatwave days varies from state to state. Rajasthan, for example, is expected to have eight to 12 heatwave days during the summer season in a normal year. However, in 2024, eastern Rajasthan experienced 23 heatwave days, while western Rajasthan had 29. Similarly, Uttar Pradesh is expected to get 10-12 days of heatwaves but had 32 last year.

The year 2024 was particularly bad. Every state in the country, except Nagaland, Manipur, Mizoram, and Tripura, experienced a heatwave. Even Kerala recorded six days of heatwave conditions during the summer season. The year saw a total of 554 heatwave days across the country — a sum of heatwave days in all the states — which was the highest in the last 15 years. The year 2010 had recorded 578 heatwave days.

NUMBER OF HEATWAVE DAYS IN INDIA*



Source: IMD

**Total of heatwave days in every state*

Incidentally, 2024 was the warmest year on record, both for the world and for India as well. However, there is no direct correlation between the number of heatwave days during a season and the average annual temperature. Heatwaves are concentrated periods of abnormally high temperatures, usually over relatively smaller areas. The annual temperature is the average of temperatures over the entire country or region over the year.

For example, 2023 was the second warmest for India on record, but it had only 230 heatwave days. The year 2022 was relatively cool as a whole, but still recorded 467 heatwave days in the country.

Increasing trend

The likely number of heatwave days in the coming season cannot be predicted with much confidence, but the fact that the frequency and intensity of heatwaves in India are rising has been established by several studies.

One recent study, 'Heat waves in India: patterns, associations, and sub-seasonal prediction skills' by Raju Mandal and colleagues at the Indian Institute of Tropical Meteorology in Pune, has mapped the heatwave trends over the country in the last seven decades.

Published in the journal *Climate Dynamics*, the study found that instances of heatwaves in central, northwest and southeast regions of the country had been growing at the rate of about three heatwave days per decade since 2000. The increase was more pronounced, in relative terms, in the southeastern coastal region that includes Odisha, and parts of Andhra Pradesh, Telangana and Chhattisgarh.

It also showed that there was a steady rise in long-duration heatwaves, those that extended for seven days at a stretch or more. The study said long-duration heatwaves had become more prevalent in the northwest, central and southeastern regions, "which may have more significant adverse impacts on ecosystems, agriculture and public health".

The study also noted instances of heatwaves occurring outside the summer months. In 2023, for example, heatwave-like conditions existed in several parts of India in February.

Heat action plans

The IMD puts out fairly accurate forecasts, alerting states, and districts, five to seven days in advance about an impending heatwave. Unlike extreme rainfall which are highly localised events, heatwaves are spread over relatively large areas and are easily captured in weather models, leading to better forecasts.

However, improved forecasts have not necessarily translated into more effective response measures to tackle heatwaves. At least 23 states, and many more districts, have developed their localised heat action plans, which list out the steps to be taken to minimise the disruption caused by heatwaves, and prevent heat-related deaths. Many of these are low-cost and relatively easy interventions, such as the creation of shades in public places, arrangements for availability of water, distribution of oral rehydration solutions among vulnerable groups, or shifting of school, college and office timings. Such measures have been very effective in reducing exposure to heat, and containing heat-related illnesses.

However, several recent assessments have shown that the implementation of heat action plans has not been adequate. A recent study by Sustainable Futures Collaborative, a Delhi-based research organisation, for example, found that the administration was more likely to implement short-term measures, such as making provision for drinking water in public places, creating cool shades for workers, or preparing hospitals for dealing with heat-related illnesses. However, longer-term interventions, like the greening of the cities, rejuvenation of water bodies, or creation of parks or open spaces which can provide long-lasting contributions towards bringing down the local temperature, were getting ignored.

In effect, the governments were only reacting to a heatwave event when it occurred, and not doing enough to deal with the problem in a more comprehensive manner. Currently, heat action plans are triggered when a forecast or an alert comes in. Instead, they need to be integrated into the overall developmental initiatives of the government as an essential measure to adapt to climate change.