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Heat Wave and its impact

Published On: 18-04-2023

Heat Wave and its impact

Why in News: Around 350 million Indians were exposed to strong heat stress between April and May 2022. Between 1990 and 2019, summer temperatures on average rose by 0.5-0.9°C across districts in Punjab, Haryana, Uttar Pradesh, Bihar and Rajasthan; about 54% of India's districts have also seen a similar rise in winter temperatures.

About Heat Wave

Heat wave is a condition of air temperature which becomes fatal to human body when exposed

Quantitatively, it is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal. In certain countries it is defined in term of the heat index based on temperature and humidity or based on extreme percentile of the temperatures.

Heat wave is considered if maximum temperature of a station reaches at least 40°C or more for Plains and at least 30°C or more for Hilly regions

a)Based on Departure from Normal Heat Wave:

Departure from normal is 4.5°C to 6.4°C

Severe Heat Wave: Departure from normal is >6.4°C

b)Based on Actual Maximum Temperature

Heat Wave: When actual maximum temperature ? 45°C

Severe Heat Wave: When actual maximum temperature ?47°C

If above criteria met at least in 2 stations in a Meteorological sub-division for at least two consecutive days and it declared on the second day.

Favourable conditions for Heat wave

a)Transportation / Prevalence of hot dry air over a region (There should be a region of warm dry air and appropriate flow pattern for transporting hot air over the region).

b)Absence of moisture in the upper atmosphere (As the presence of moisture restricts the temperature rise).

c)The sky should be practically cloudless (To allow maximum insulation over the region).

d)Large amplitude anti-cyclonic flow over the area.

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IMD Colour code for Heat waves

India Meteorological Department issues following colour code impact based heat warning jointly with National Disaster Management Authority.

Colour Code	Alert	Warning	Impact
Green (No action)	Normal Day	Maximum temperatures are near normal	Comfortable temperature. No cautionary action required.
Yellow Alert (Be updated)	Heat Alert	Heat wave conditions at isolated pockets persists on 2 days	Moderate temperature. Heat is tolerable for general public but moderate health concern for vulnerable people e. infants, elderly, people with chronic diseases
Orange Alert (Be prepared)	Severe Heat Alert for the day	(i) Severe heat wave conditions persists for 2 days (ii) Through not severe, but heat wave persists for 4 days or more	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.

Impact of Heat waves

The impact of heat waves on human health is significant. Heat-related illnesses, such as heat exhaustion and heatstroke, are becoming more common, particularly among vulnerable groups such as the elderly, children, and outdoor workers.

In addition, heat waves can exacerbate existing health problems, such as respiratory and cardiovascular diseases.

The impact of rising temperatures also has an impact on the environment. One of the biggest problems is the depletion of water resources. Water sources are drying up as temperatures rise, leading to crises in many parts of the country. This, in turn, leads to agricultural problems, with crops failing and farmers struggling to make a living.

Given that around 40 per cent of India's population is engaged in agriculture, this is a significant concern. Reports are already coming from Punjab and Western Uttar Pradesh that the early heatwave has affected the growth of wheat crops and is expected to negatively affect the crop to the tune of 20 per cent.

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Another problem caused by rising temperatures is air pollution. As people try to keep cool, they use more air conditioning, increasing electricity use. This leads to an increase in the use of fossil fuels, which significantly contributes to air pollution. The combination of high temperatures and air pollution can be hazardous for people with respiratory problems.

The healthcare costs associated with heat-related illnesses can be significant, particularly for vulnerable groups who may not have access to affordable healthcare. In addition, heat waves can lead to a decrease in worker productivity, which can impact economic growth.

The Way Ahead

One solution is to increase public awareness. People need to be educated about the impact of rising temperatures on their health, the environment, and the economy. This can be done through public campaigns, schools, and the media.

Another solution is to increase the use of renewable energy. India has already made significant progress in this area. The country registered the highest year-on-year growth in renewable energy, of nearly 10 per cent, in 2022.

However, much remains to be done. The government could incentivise individuals and businesses to invest in renewable energy, such as solar panels. This would help reduce the impact of rising temperatures, create new jobs, and stimulate economic growth.

Improving water management is also essential. This could include introducing more efficient irrigation systems, better rainwater harvesting, and using recycled water for non-potable purposes. This would help to conserve water resources and reduce the impact of rising temperatures on agriculture.

Finally, investing in infrastructure that can cope with extreme temperatures is essential. This could include the construction of roads and buildings that are designed to withstand high temperatures, as well as the development of more efficient cooling systems that use less energy.

The Way Ahead

The rising heat wave in India is a serious concern that needs to be addressed urgently. The impacts of rising temperatures on human health, the environment, and the economy are significant. However, with the right strategies in place, it is possible to mitigate the impact of rising temperatures and ensure a sustainable future for the country.

Red Alert (Take Action)	Extreme Heat Alert for the day	(i) Severe heat wave persists for more than 2 days. (ii) Total number of heat/severe heat wave days exceeding 6 days.	Very high likelihood of developing heat illness and heat stroke in all ages.
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