Heat Waves in India

This editorial is based on **"A Robust Plan to Tackle Heightened Heat Stress"** which was published in Hindustan Times on 20/07/2022. It talks about the heatwaves in India and related challenges.

For Prelims: Heat Waves, National Disaster Management Authority, Greenhouse gases, Aerosols, Sendai Framework for Disaster Risk Reduction, National Action Plan for Climate Change, Nature based solutions, Passive cooling technology

For Mains: Criteria for Heatwaves, Strategies to Mitigate the Impacts of Heat Waves in India

The advent of **heatwaves** has adversely affected the whole world and India is no outlier in this context. According to a report by Lancet, **India's vulnerability to extreme heat increased 15%** from 1990 to 2019. The **five warmest years** ever recorded in India have **all been in the last decade.**

In May 2022, the **European Space Agency** recorded land surface temperatures nearing 55°C over many parts of northwest India, crossing **60°C** in some pockets. The **five warmest years ever recorded in India** have **all been in the last decade.**

Moreover, humidity, scant rain, and high temperatures have pushed up discomfort levels, making the lives of those without cooling facilities even tougher. **Heat stress should no longer come as a surprise. It demands a comprehensive response.**

What is a Heatwave?

- **A heatwave is a period of abnormally high temperatures,** a common phenomenon in India during the months of **May-June and in** some **rare cases even extends till July.**
- India Meteorological Department **(IMD)** classifies heat waves according to regions and their temperature ranges.As per **IMD**, the number of heatwave days in India has increased from 413 over 1981-1990 to 600 over 2011-2020.
    - This **sharp rise in the number of heatwave days** has resulted **due to the increasing impact of climate change.**

What is the Criteria for Declaring a Heatwave?

- The Heatwave is considered when the maximum temperature of a station reaches at least **40°C for Plains** and at least **30°C for Hilly regions.**
- If the **normal maximum temperature of a station is less than or equal to 40°C,** then an **increase of 5°C to 6°C** from the normal temperature is **considered to be heat wave condition.**
    - Further, an **increase of 7°C or more from the normal temperature** is considered a **severe heat wave condition.**

- If the **normal maximum temperature of a station is more than 40°C,** then an **increase of 4°C to 5°C** from the normal temperature is considered to be heat wave condition. Further, an increase of 6°C or more is **considered a severe heat wave condition.**
    - Additionally, if the **actual maximum temperature remains 45°C** or more **irrespective of normal maximum temperature, a heat wave is declared**.
- **In 2016**, the National Disaster Management Authority **(NDMA)** issued comprehensive guidelines to prepare national level key strategies for mitigating the impact of heatwaves.

What are the Impacts of Heat Waves In India?

- **Economic Impacts:** The frequent occurrence of heat waves also adversely affects different sectors of the economy.
    - For instance, **the livelihood of poor and marginal farmers is negatively impacted due to the loss of working days**.
    - Heatwaves also have an adverse impact on daily wage workers' productivity, impacting the economy.
- **Impact on Agriculture Sector:** Crop yields **suffer when temperatures exceed the ideal range.**
    - Farmers in **Haryana, Punjab and Uttar Pradesh** have **reported losses in their wheat crop** in the past rabi season. Across India, **wheat production could be down 6-7% due to heat waves.**
    - **Livestock is also vulnerable to heatwaves.**
        - Researchers at Cornell University estimate that, **by 2100, milk yields in India could drop by 25%** (against 2005 levels) in **arid** and **semi-arid** dairy farming due to increased heat stress.
- **Impact on Electricity Usage:** Naturally, heatwaves impact power load.
    - In the **North India,** the **average daily peak demand in April** was **13% higher than 2021** and **30% higher in May.**
- **Human Mortality: Mortality** due to heat waves occurs because of rising temperature, **lack of public awareness programmes**, and **inadequate long-term mitigation measures.**
    - According to a 2019 report of the Tata Centre for Development and the University of Chicago, by 2100, **annually, more than 1.5 million people will be likely to die due to extreme heat caused by climate change.**
    - The increased heat will lead to an increase in diseases like **diabetes**, **circulatory** and **respiratory conditions,** as well as **mental health challenges.**
- **Food Insecurity:** The **concurrence of heat and drought events are causing crop production losses** and **tree mortality.**
    - **The risks to health and food production** will be made more severe from the sudden food production losses exacerbated by heat-induced labour productivity losses.
        - **These interacting impacts will increase food prices,** reduce household incomes, and lead to malnutrition and climate-related deaths, especially in tropical regions.
- **Impact on Workers:** Workers in sectors like **agriculture** and **construction** will be severely impacted in 2030 because **India's large population depends on these sectors** for their livelihoods.
- **Weaker Sections to be Specifically Affected:** The climate science community has reported overwhelming evidence that extreme events such as heatwaves are likely to become more intense, more frequent and of longer duration in future unless **emissions of** greenhouse gases and **aerosols** are significantly cut globally.
    - It is important to remember that heatwaves in India, such as the current event, have the **potential to influence thousands of vulnerable and poor people** who **contributed very little to the** climate crisis.

What Long-Term Strategies does India need to Adopt to Mitigate the Impacts of Heat Waves?

- **A Heat Waves Action Plan:** The adverse impacts of heat waves indicate that **effective disaster adaptation strategies and more robust** disaster management **policies are required in**

heatwave zones to lessen the impact of heatwaves.
    - As **deaths due to heatwaves are preventable**, the **government must prioritise preparing a long-term action plan to safeguard human lives, livestock, and wildlife.**
    - Effective implementation of the Sendai Framework for Disaster Risk Reduction **2015-30** with the State playing a leading role and sharing responsibility with other stakeholders is now the need of the hour.
- **Public Awareness and Early Warning Systems:** Disseminating **public awareness through print, electronic and** social media, providing **heat-proof shelter facilities in heatwave prone areas** during summer, easing access to public drinking water, and afforestation programmes **in urban and rural areas** would help mitigate heat wave fatalities.
    - Death from heat waves can be prevented by installing **improved early warning systems** that communicate heatwave threats, recommend different preventative measures, and constrain disaster impacts.
- **Implementing Climate Action Plans:** National Action Plan for Climate Change **(NAPCC)** should be implemented in true spirit for inclusive growth and **ecological sustainability.**
    - **Nature-based solutions** should be taken into account, **not just for tackling climate change** but also doing it in a way that is **ethical** and promoting **intergenerational justice.**
- **Recognition of Heat Waves as a Natural Disaster:** Recognising heat waves as a major disaster is long due. India still has a long way to go in building public awareness, particularly on how individuals and local communities can take care of themselves.
    - Declaring heat waves as a natural disaster would help the state and district administration prepare a **heatwave action plan at the regional level.**
    - Also, there needs to be **clear guidelines regarding when to shut schools or how long one should stay outdoors if that's unavoidable.**
- **Sustainable Cooling:** Passive cooling technology**,** a widely-used strategy to create **naturally ventilated buildings, can be a vital alternative to address the urban heat island** for residential and commercial buildings.
    - The Intergovernmental Panel on Climate Change **(IPCC)** in the third part of its AR6 stated that ancient **Indian building designs** that have used this technology, can be **adapted to modern facilities in the context of global warming.**
- **Replacing Dark Roofs:** A big reason that **cities are hotter than rural areas is that they are covered by** dark roofs, roads and parking lots that absorb and retain heat.
    - One of the long term solutions can be **replacing the dark surfaces with lighter and more reflective materials**, it will result in a comparatively cooler environment.
- **Climate-Resilient Crops:** A dynamic understanding of risks is needed to evaluate whether the crops we have relied on so far will also be the ones to provide food and nutrition security in future.
    - Provisions will have to be made for **insurance against crop loss** and **mixed cropping** should be promoted.

Drishti Mains Question

Explain why heat waves are confined to North-Western and South Central parts of India. Discuss the strategies that India needs to adopt to mitigate the impacts of heat waves.

UPSC Civil Services Examination, Previous Year Question (PYQ)

Q. What are the possible limitations of India in mitigating global warming at present and in the immediate future? (2010)

1. Appropriate alternate technologies are not sufficiently available.
2. India cannot invest huge funds in research and development.
3. Many developed countries have already set up their polluting industries in India.

Which of the statements given above is/are correct?

(a) 1 and 2 only

(b) 2 only
(c) 1 and 3 only
(d) 1, 2 and 3

Ans: (a)
