Heat Extremes in India

This editorial is based on "India Needs an Emergency Plan for Heat Extremes" which was published in Hindustan Times on 22/03/2022. It talks about the impact of heat waves and suggests measures to overcome the same.

For Prelims: Heatwaves, Global Warming, Climate Change, India Meteorological Department (IMD), Lancet Countdown on Health and Climate Change report, IPCC, AR6 Report

For Mains: Heat Waves - causes and impacts, Measures to tackle extreme heat waves, Findings/Analysis of IPCC and Lancet Reports

Recently, the parts of **Antarctica** recorded maximum temperatures that are **more than 40°C** warmer than average and areas of the **Arctic more than 30°C** warmer than average.

In many parts of India too, winter switched to summer, with not even a fleeting spring in between.

Heatwaves associated with **abnormally high temperatures over certain areas,** which could also be **fatal to humans and animals,** are also on a rise across the country, while there is a **declining trend in the occurrence of cold waves**.

What are Heat Waves?

- A heat wave is a period of abnormally high temperatures, more than the normal maximum temperature that **occurs during the summer season** in the **North-Western and South Central parts of India**.
    - It is a condition of air temperature which becomes fatal to the human body when exposed.
- The **India Meteorological Department (IMD)** requires that temperatures should reach **at least 40°C in the plains** and **at least 30°C in the hilly regions,** and should reflect an increase of at least 5℃-6℃ above the normal temperature **to be classified as a heatwave**.
- The combination of **global warming and population growth** in already-warm cities in India is the primary driver of increased heat exposure.
    - The **Urban Heat Island** also elevates temperatures within cities, which will be amplified during the heatwaves.
    - UHIs occur when cities replace natural land cover with dense concentrations of pavement, buildings, and other surfaces that absorb and retain heat.

What is the Scenario of Heat Waves in India?

- **India,** along with **Bangladesh and Pakistan,** recorded the **greatest losses to work hours (295 billion hours) due to heat exposure** in 2020, according to the **Lancet Countdown on Health and Climate Change released in 2021**.

    - India has become **15% more vulnerable** to extremes of heat than in 1990.
    - Indian **senior citizens were among the most affected ones** due to heatwave exposure.
- More recently, most parts of western **Rajasthan, Maharashtra,** and parts of **Gujarat, Odisha** are reeling under **severe heat wave-like conditions,** with maximum **temperatures hovering well over 40°C**.
    - The foothills of the Western Himalayas recorded very high day and night temperatures - 7 to 10 degrees above normal.
    - Delhi recently recorded a 36.6℃, 6 degrees above normal.
- The IMD's long-term temperature trends indicate that the **climate crisis is having a pronounced impact** on increasing the frequency and severity of heatwaves in India.
    - Average temperatures across seasons have seen a **sharp upward trend in the country since 1991**.
    - The temperature rising trend is **more evenly pronounced during monsoon** (June to September) and **post-monsoon** (October to December) seasons.

What is the Impact of these Heat Waves?

- **Mortality and Morbidity:** The **Intergovernmental Panel on Climate Change (IPCC)** in the **Second Part of AR6 Report** flagged that heat extremes are causing **human deaths and morbidity**.
    - The increased heat will lead to an increase in diseases like **diabetes**, circulatory and **respiratory conditions**, as well as **mental health challenges**.
- **Crop Damage:** The fallout of these heat waves is far more complex - the concurrence of heat and drought events are causing crop production losses and tree mortality.
- **Less Food Production and High Prices:** 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**.
- **Labour Productivity Loss:** A higher urban population also implies heat-induced labour productivity loss, **resulting in economic impacts**.
    - Millions of **farmers and construction workers could have lost income** because on some days it's just too hot for them to work.
- **Wildfires and Droughts:** The Lancet report, 2021 showed that populations of **134 countries** experienced an **increase in exposure to** wildfires with droughts **becoming more widespread** than ever before.

What Steps Can Be Taken in this Regard?

- **Adopting A More Sensitive Approach:** The **impact of such excessive heat needs to be understood from the point of view of common people — daily labourers; farmers; traders; fishermen** etc.
    - Beyond numbers and graphs that capture the impact of the climate crisis, the **human experience of living in oppressive heat needs to be understood** by policymakers and measures should be taken accordingly.
- **Cooling Shelters:** The government should come out with a policy to deal with the suffering and disability caused by heat extremes in different parts of the country.
    - **Water kiosks, staggered outdoor work hours, cool roofs for buildings** and homes are certain things that should be put in place immediately.
    - A number of emergency **cooling shelters can be opened** so that people without domestic air conditioning units can escape the heat.
        - **Portable air-conditioning units,** along with fans and even ice are also useful.
- **Passive Cooling to Reduce Urban Heat Islands:** **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 IPCC report cites **ancient Indian building designs** that have used this technology, which could be adapted to modern facilities in the context of global warming.
- **Action Plans Similar to Ahmedabad:** As per the IPCC Report, Ahmedabad has shown the way to

combat heat extremes by **heat-proofing buildings**.
    - After the heat action plan was implemented in 2013 in Ahmedabad, **heat-related mortality reduced by 30% to 40%** over the years. Similar plans like that of Ahmedabad can be implemented in vulnerable regions.
- **Replacing Dark Roofs:** A big reason that cities are so much 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.

Drishti Mains Question:
"Reducing the health impacts of extreme heat is an urgent priority and should include immediate changes to infrastructure, urban environment, and individual behaviour to prevent heat-related deaths". Discuss.
