Heatwave Crisis

Why in news?

The recent heatwave in North and Central India has led to severe consequences, with multiple fatalities reported due to sunstroke and heatstroke.

Status of heatwave in North India
• Bihar's Aurangabad city and Odisha's Rourkela region have witnessed deaths attributed to extreme heat. • Delhi- It recorded an unprecedented high temperature of 52.9°Celsius, though this reading is under scrutiny due to potential sensor errors. • According to the India Meteorological Department (IMD), temperatures in northwestern and central India are expected to decrease gradually by 2-3° Celsius over the next 3 days. • Delhi, Haryana, Chandigarh, Rajasthan, and parts of Madhya Pradesh, Uttar Pradesh, Bihar, Jharkhand, and Odisha, ranged between 45-48°Celsius. • Other regions like western Madhya Pradesh, Chhattisgarh, and coastal Andhra Pradesh recorded temperatures between 42-45Celsius.

What is heatwave?

- **About-** According to IMD, heatwave is a period of abnormally high temperatures, more than the normal maximum temperature that occurs during the summer season in the North-Western parts of India.
- **Occurrence-**Heatwaves typically occur between March and June, and in some rare cases even extend till July.
- **Impact-**The extreme temperatures and resultant atmospheric conditions adversely affect people living in these regions as they cause physiological stress, sometimes resulting in death.
- **Qualitatively-** Heat wave is a condition of air temperature which becomes fatal to human body when exposed.
- **Quantitatively-** Heatwave is defined based on the temperature thresholds over a region in terms of actual temperature or its departure from normal.
- **Heatwave-** If the prevalent temperature is 4.5°C to 6.4°C more than normal, it is classified as a heatwave.
- **Severe heatwave**-A rise of more than 6.4°C is considered a severe heatwave. May is the peak month for heatwaves in India.

What causes heatwave in North India?

- **Influence of El Nino-** During El Nino trade winds weaken and surface temperature rise, this disrupts Indian monsoon reducing moisture flow from the Indian Ocean to the subcontinent.

El Niño refers to the warming of sea surface temperatures in the Central and Equatorial Pacific.

- **Continentality-** As an inland city, Delhi is less influenced by the moderating effects of nearby oceans, thus the city experiences intensified heat due to the movement of hot, dry air masses from arid regions like the Thar Desert.
- **Urbanization-** A recent study has revealed that urbanization alone has led to a 60% enhancement in warming in Indian cities.
- **Urban heat island effect-** Urban areas experience higher temperatures than rural surroundings due to the replacement of natural landscapes with buildings, roads, and other infrastructure which increases the temperature.
- **Reduced green spaces**- The decrease in vegetation and tree cover reduces natural cooling through shade and evapotranspiration.
- **Heat absorbing materials**- Urban materials such as concrete, asphalt, and bricks have high thermal inertia, meaning they absorb and retain heat longer than natural surfaces.
- **Energy consumption-** Increased energy usage for cooling in urban areas leads to higher emissions of greenhouse gases, further warming the environment.
- **Global warming**-The Urban Heat Island contributes to global warming, as cities grow and demand more energy, greenhouse gas production increases.
- **Night time impact**- A report by Centre for Science and Environment suggests that cities are not cooling down at nights as they used to be, denying people a chance to recover from daytime heat.
- **Loss of evapotranspiration**- Due to deforestation and changing land use pattern there is loss of trees and vegetation, it leads to less cooling through evapotranspiration, leading to higher local temperatures.
- **Policy concerns-** Delhi has a Heat Action Plan (HAP) for 2024-2025, but it needs further development and implementation to be effective, experts suggest that the plan requires proper financing, legal backing, and a focus on vulnerable populations.

What are the impacts of heatwave?

- **Heat exhaustion**- It is characterized by heavy sweating, weakness, dizziness, nausea, and fainting which occurs when the body loses excessive amounts of water and salt.
- **Heat stroke-** A severe, life-threatening condition where the body fails to regulate its temperature, leading to dry, warm skin, confusion, unconsciousness, and potential organ failure. Immediate medical intervention is critical.]
- **Health impact-** Heatwaves increase the incidence of heat-related illness such as heatstroke, dehydration, heat exhaustion and heat cramps.
- **Drought-** Prolonged heatwaves can exacerbate drought conditions by increasing evaporation rates and reducing soil moisture.
- **Water scarcity**- Reduced water availability affects both human populations and natural ecosystems.
- **Ecosystem stress**- Wildfires can destroy habitats, reduce biodiversity, and disrupt ecological balances.
- **Economic impact-**Farmers and the food industry face significant economic losses due

to reduced productivity and increased costs for irrigation and livestock care.
- **Food security**- Reduced agricultural output can lead to food shortages and increased food prices, affecting food security for populations.
- **Infrastructural damages-**Prolonged heat can damage infrastructure such as roads, railways, and power lines, further compounding the challenges during heatwave.

What lies ahead?

- The ongoing heatwave in India underscores the urgent need for effective climate adaptation strategies and robust urban planning to mitigate the adverse effects of rising temperatures.
- Addressing the heatwave requires a multifaceted approach, including climate adaptation strategies, improved urban planning, and measures to enhance green cover and reduce heat absorption in cities.

Quick facts

Delhi Heat Action Plan
• **Developed by**- Delhi Disaster Management Authority as per National Disaster Management Authority (NDMA) guidelines. • **Aim-** To provide a framework for the implementation, coordination, and evaluation of extreme heat response activities in Delhi that reduce the negative health impacts of extreme heat. • **Objective**- To alert those populations most at risk of heat-related illness that extreme heat conditions either exist or are imminent, and to take appropriate precautions. • **Role-** • Facilitate stakeholders in preparing a Heat Management plan. • Provide insight into heat-related illnesses. • Outline necessary mitigative and response actions during extreme heat events. **Strategy** • Vulnerable populations and the health risks specific to each group • General heat-health risks. • Effective strategies, agency coordination, and response planning • Process of activating heat alerts and the plan implementation. • Evaluate and update the Heat Action Plan based on new learning

References

1. The Hindu- Heatwave alert in India
2. DDMA- Delhi Heat Action Plan

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