Heat Waves and its Impacts

Why in news?

There is a sharp rise in the urban temperature in India leading to the exposure of strong heat stress during summer season.

What is a 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.

What is the criterion for declaring heat wave?

- Heat wave is considered if maximum temperature of a station reaches at least 40 degree C or more for plains and at least 30 degree C or more for hilly regions.
- **Based on Departure from Normal**
  - **Heat Wave**: Departure from normal is 4.5^0 C to 6.4^0 C
  - **Severe Heat Wave**: Departure from normal is >6.4^0C
- **Based on Actual Maximum Temperature**
  - **Heat Wave**: When actual maximum temperature ≥ 45^0 C
  - **Severe Heat Wave**: When actual maximum temperature ≥47^0 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.
- **For coastal areas** - When maximum temperature departure is 4.5 degree C or more from normal, heat wave may be described provided actual maximum temperature is 37 degree C or more.

Warm night is considered only when maximum temperature remains 40 degree C or more.

What are the favorable conditions for Heat wave?

- 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).
- Absence of moisture in the upper atmosphere (As the presence of moisture restricts the temperature rise).
- The sky should be practically cloudless (To allow maximum insulation over the region).

- Large amplitude anti-cyclonic flow over the area.
- It is occurring mainly during March to June and in some rare cases even in July but peak month of the heat wave over India is May.

What are the impacts of heat wave?

- Loss of human life
- Decreased work productivity
- Increased out of pocket health expenditure
- Agricultural crop losses
- Prone to heat-related illness such as Heart disease, Mental illness, Poor circulation and Sunburn

How to mitigate extreme heat wave events?

- **Increasing green cover** - Greening could help mitigate heat waves and urban forest should also need to be increased.
- **Wetlands** - The wetlands needs to expanded and restored.
- **Water bodies** - Restoring dead and decaying ponds/lakes should be given utmost importance.
- **Urban heat effect** – Reducing the Urban heat island effect by reducing the use of preamble materials in the civic infrastructure and residential construction.
- Enhancing natural landscapes in urban areas will also address the effect.
- **Urban building standards** - It should be upgraded to avoid usage of heat absorbent galvanized iron and metal roof sheets.
- **Cleaner cooking fuels** - Use of it will reduce indoor air pollution, which may also help reduce urban heat.
- **Natural vegetation** - Can be increased in the streets with the low ventilation.
- **Public transportation** - This can reduce the pollution and mitigate the extreme heat.
- **Landfill management** - A push for waste segregation, along with solid waste management at source can reduce the landfills fires which may contain methane.
- **Forecasting ability** – It should be widened to include the impacts of extreme heat in the food production.

References

1. The Hindu | Extreme Heat
2. CDC | Health Impacts

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