Heat Index

For Prelims: India Meteorological Department (IMD), Heat Index, Urban heat Island Effect, National Disaster Management Authority (NDMA).

For Mains: Issues Related to Heat Waves in India.

Why in News?

The **India Meteorological Department (IMD)** is planning to introduce a **'heat index'** warning system in Delhi and other parts of the country.

What are Recent Studies of IMD Suggests?

- The IMD has conducted a study on the impact of meteorological factors on **heatwaves** and the **"heat wave hazard zonation"** of the country.
- According to **"Hot Weather Analysis over India,"** IMD revealed that the mechanism by which **heat impacts humans is complex;** it is a **result of the interactions between temperature, radiation, wind, and humidity.**
    - There is strong experimental evidence that **physiologic stress from high temperatures is greater if humidity is higher.**

What is the Proposed Heat Index?

- **About:**
    - Heat Index will **calculate the temperature along with the humidity levels** to provide a more **accurate measure** of what the **temperature** actually feels like.
    - In the US, the **heat index is color-coded to provide warnings** based on the impact of the heat index.
        - The **IMD is planning to introduce a similar color-coded warning system** in India.
- **Significance:**
    - Heat Index has important considerations for the human body's comfort.
        - When the body gets too hot, it **begins to perspire or sweat to cool itself off.** If the perspiration is not able to evaporate, the **body cannot regulate its temperature.** Evaporation is a cooling process. When perspiration is evaporated off the body, it effectively reduces the body's temperature.
        - When the atmospheric moisture content (i.e., relative humidity) is high, the rate of evaporation from the body decreases. The **human body feels warmer in humid conditions.** The opposite is true when the **relative humidity decreases because the rate of perspiration increases.** The body actually feels cooler in arid conditions.
    - There is **direct relationship between the air temperature and relative humidity** and the heat index, meaning as the **air temperature and relative humidity increase (decrease), the heat index increases (decreases).**

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.
- 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.**
- 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 Factors Responsible for Delhi's Higher Temperature than its Actual Value?

- **Urban Heat Island Effect:** Delhi is a highly urbanized area, with **large amounts of concrete, buildings, and asphalt.** These surfaces absorb and retain heat, creating an **urban heat island effect.** This can make the temperature feel hotter than it actually is.
- **Air Pollution:** Delhi experiences high levels of air pollution, because of stubble burning in Punjab and Haryana region**, vehicular and industrial emissions, dust from construction activities.**
  - This pollution can **trap heat and create a blanket effect, keeping the city warmer.**
  - Also, Delhi's high humidity can also exacerbate air pollution levels.
- **Lack of Water Bodies in Close Proximity:** Delhi is **not located near any large water bodies, such as a sea or a lake**. This means that there is **no source of cool air coming from the water,** which can make the air feel hotter.

Source: IE

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