Urban Heat Island (UHI)

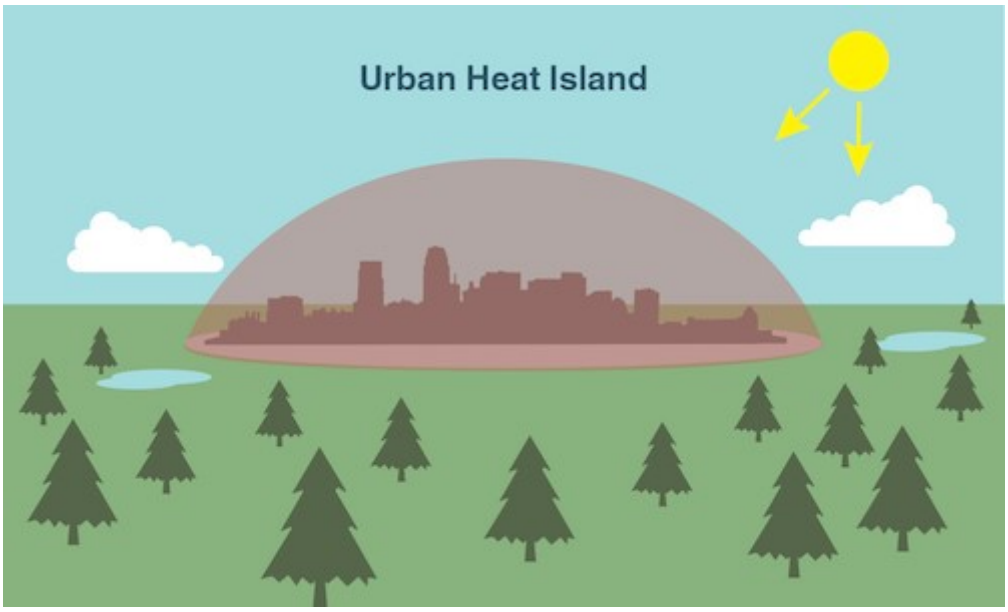
Prelims (GS I) – *Current events of national and international importance| General issues on Environmental ecology, Bio-diversity and Climate Change.*

Mains (GS I) – *Conservation*

Why in news?

A recent study published in Nature Climate Change provides a global perspective on how UHI impacts both heat and cold related mortality.

- **Urban heat island (UHI)** – A phenomenon that occurs when a city experiences much warmer ambient temperatures than nearby rural areas.



- **Causes** – Existence of Concrete buildings, asphalt roads and reduced vegetation in cities that lead to trap and absorb heat, limiting dissipation of heat.
- Lack of green spaces and high energy use (e.g., air conditioning), that further elevate temperatures.
- **Temperature variation** – Urban areas can be 3–5°C warmer than rural surroundings, sometimes more during heatwaves.
- **Impacts** – Increased energy consumption, air pollution, heat-related health issues and stress on nearby ecosystems.

Implications of UHI

- **Dual impact of UHI on mortality** – While heat islands increase heat-related deaths *in hot seasons*, they can reduce cold-related deaths in cooler conditions
- **Heat-related mortality** – UHI *increases temperatures in hotter* seasons, leading to

higher heat exposure and subsequent deaths, particularly in summer.

- **Cold-related mortality** – In cooler seasons, the warmer urban temperatures *reduce cold-related deaths* by mitigating extreme cold exposure.
- Globally, in 2018, the reduction in cold-related mortality was 4.4 times greater than the increase in heat-related mortality due to UHI.
- **Regional and seasonal variations** – Cities at high latitudes experience a greater reduction in cold-related deaths.
- For instance, Moscow saw an 11.5 times greater reduction in cold-related mortality compared to heat-related mortality.
- **Poor air and water quality** – Urban heat islands can have worse air and water quality than their rural neighbours.

Way forward

- The Common strategies such as *urban forests, green roofs and reflective buildings* that mitigate the urban heat island could be avoided, since they potentially ***increase cold-related deaths*** more than they decrease the heat-related deaths.
- Cities need *region and season specific strategies* to balance UHI mitigation with health outcomes, avoiding unintended increases in cold-related deaths.
- *Take a seasonal approach to heat island mitigation* is crucial for effective urban planning in the context of climate change and urbanization.
- Using lighter-coloured materials on buildings helps to reduce the heat of the surrounding areas.

Reference

1. The Hindu| Urban Heat Islands
2. National geographic