

The year 2023 was by far the hottest ever according to a recent World Meteorological Organization (WMO) report. Global average temperatures reached 1.45° C higher than pre-industrial levels, almost touching the 1.5° C limit set in the Paris Agreement. Scientists predict that 2024 could be similar. With global emissions still growing, climate impacts are worsening. Heatwaves are sweeping through the Indian sub-continent. And, more hotter and longer-lasting heat waves are being predicted in the years to come.

What is the Urban Heat Island (UHI) effect?

The Urban Heat Island (UHI) effect refers to the phenomenon where urban areas are significantly warmer than their rural surroundings due to human activities.

Here are key points about the UHI effect:

- Urban areas like Chennai experience higher temperatures, by about 2° to 4°C, compared to nearby rural areas.
- Structures such as concrete buildings and tarmac roads absorb and retain heat, exacerbating the temperature rise.
- The lack of green spaces and the heat from air conditioners and vehicles add to the UHI effect.
- Night time in cities can be especially hotter, trapping heat within the urban environment.

The urban heat island effect

Refers to the **increase in temperature** in **urban environments** compared to surrounding areas.

health, increasing the risk of cardiovascular disease, heat stroke, sunstroke, dehydration and heat-related deaths Building materials such as concrete and asphalt absorb and trap heat, heating up cities

High temperatures affect

The consequences are worse for **vulnerable groups**, such as the elderly, babies or people with chronic illnesses

> Green areas around cities stay cooler

ISGlobal

What are the initiatives taken by the Government to overcome this?

- India has national, state, and district-level Heat Action Plans to reduce heatwave impacts.
- These include early warnings, staggered work hours, shaded areas, and provision of drinking water and oral rehydration salts.
- Urban Planning: The Chennai Metropolitan Development Authority (CMDA) is commissioning detailed heat maps for better planning and intervention strategies. These actions aim to mitigate heat effects and improve urban liveability while moving towards sustainable development goals.

Heat Action Plans (HAP):

- **1. Aim–** Its aim is to increase preparedness and lower the adverse impacts of extreme heat by outlining strategies and measures to prepare for, address, and recover from heatwaves.
- **2. Mapping Heat Risks-**They give an overview of each region's heat conditions, showing past heatwaves, trends in summer temperatures, land surface temperature, and more. Then, they assess vulnerability to identify areas needing urgent attention and plan a response.
- **3. Collaborative Efforts-**The National Disaster Management Authority and IMD are working with 23 States to develop HAPs. It outlines the roles and responsibilities of various line departments, such as the disaster management authority, labour department, and police.
- **4. Significance** In the wake of the rising severity and frequency of heatwaves nationwide, governments at different levels, state, district, and city have formulated heat action plans (HAPs).

What should be done to reduce UHI?

- ✤ Increase Green Cover: Expanding urban forests, parks, and green spaces, which cool the environment through evaporation and provide shade.
- Energy-Efficient Air Conditioning: Encouraging the use of energy-efficient air conditioners that produce less waste heat.
- **Improve Building Design:** Constructing buildings with materials and designs that naturally keep interiors cool.
- Reflective Surfaces: Applying reflective paint on roofs, walls, and streets to reflect sunlight and reduce heat absorption.
- Enhance Public Transport: Reducing reliance on personal vehicles by improving public transport systems, including electric buses.
- Permeable Pavements: Installing permeable pavements that absorb less heat and allow water to permeate, cooling the environment.

Expected Question for Prelims

Que. Consider the following statements with reference to Heat Action Plan:

- 1. This is an integrated plan for the whole of India by the Indian Meteorological Department.
- 2. Various departments like Disaster Management Authority, Labor Department and Police have a role in this.

Which of the statements given above is/are correct?

- (a) Only 1 (b)
- (c) Both 1 and 2 (d)
 - Answer : B

Only 2

Mains Expected Question & Format

Que.: What is the urban heat island effect? What steps should be taken to reduce the urban heat island effect in metropolitan cities? Discuss.

Answer's Point of View:

- Explain the urban heat island effect in the first part of the answer.
- In The second part discuss those steps that can be taken to reduce the urban heat island effect in metropolitan cities.
- Finally give a conclusion giving suggestions.

Note: - The question of the main examination given for practice is designed keeping in mind the upcoming UPSC mains examination. Therefore, to get an answer to this question, you can take the help of this source as well as other sources related to this topic.