Be Mains Ready

"Anthropogenic forcings are exacerbating the phenomenon of urban heat islands in India". Discuss the factors that give rise to Urban heat islands. (150 words)

06 Nov 2020 | GS Paper 1 | Geography

Approach / Explaination / Answer

- Briefly describe the phenomenon of Urban Heat Island effect.
- Discuss the major anthropogenic activities that cause the formation of urban heat islands in India.
- Give a suitable conclusion.

Introduction

- Urban Heat Island(UHI) effect is defined as the presence of significantly higher temperatures in urban areas compared to the temperatures in surrounding rural zones mainly due to human factors.
- Usually urban heat islands have a mean temperature **8 to 10 degrees more** than the surrounding rural areas.
- These can affect communities by increasing summertime peak energy demand, air conditioning costs, air pollution and greenhouse gas emissions, heat-related illness and mortality.

Body

Causes of Urban Heat Island effect

- **Manifold increase in construction activities:** For building simple urban dwellings to complex infrastructures, carbon absorbing material like asphalt and concrete is needed for the expansion of cities. They trap huge amounts of heat which increases the mean surface temperatures of urban areas.

- **Dark surfaces:** Many buildings found in urban areas have dark surfaces, thereby decreasing albedo and increased absorption of heat.
- **Air conditioning:** Buildings with dark surfaces heat up more rapidly and require more cooling from air conditioning, which requires more energy from power plants, which causes more pollution. Also air conditioners exchange heat with atmospheric air, causing further local heating. Thus there is a cascade effect that contributes to the expansion of urban heat islands.
- **Urban Architecture:** Tall buildings, and often, accompanying narrow streets, hinder the circulation of air, reduce the wind speed, and thus reduce any natural cooling effects. This is called the **Urban Canyon Effect.**
- **Need for mass transportation system:** Transportation systems and the unimpeded use of fossil fuels also add warmth to urban areas.
- **Lack of Trees and green areas:** which impedes evapotranspiration, shade and removal of carbon dioxide, all the processes that help to cool the surrounding air.

Conclusion

Thus the increased use of manmade materials and increased anthropogenic heat production are the main causes of the UHI. To reduce UHI there is a need for planned urbanization for which we don't require only smart cities but Smart-Green cities.