



## Mains Practice Question

**Q.** What do you understand by Urban Heat Island effect? Mention the factors that give rise to this phenomenon. (250 words)

20 May, 2019 GS Paper 1 Geography

### Approach

- Define Urban Heat Island effect.
- Enlist and describe the causes of Urban Heat Island effect.
- Give conclusion.

### Introduction

- Urban Heat Island 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

- Use of construction materials like Asphalt and concrete: Asphalt and concrete, needed for the expansion of cities, absorb huge amounts of heat, increasing 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 need for planned urbanization for which we don't require only smart cities but Smart-Green cities.

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