

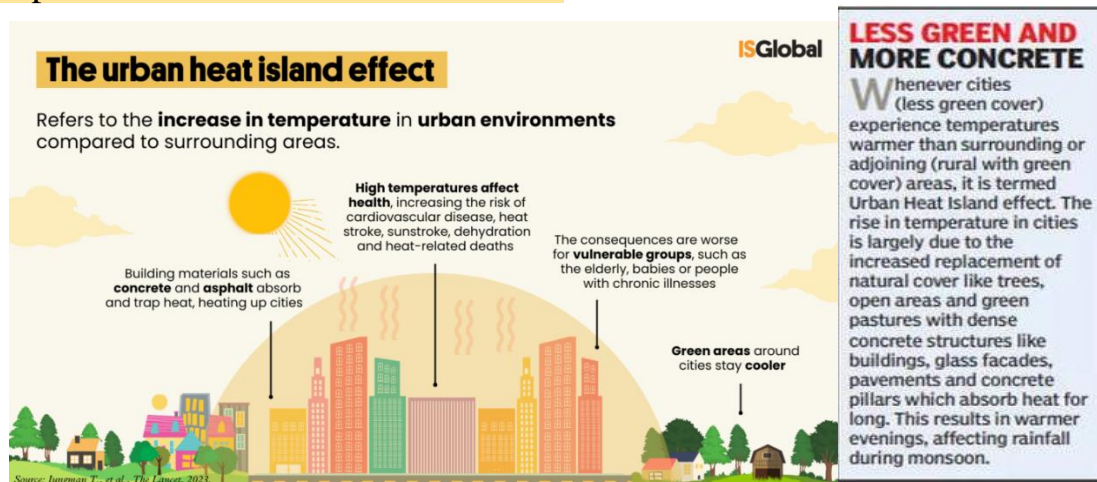
Heat-baked Chennai can set an example for India

News context

- 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.
- With global emissions still growing, climate impacts are worsening. Scientist predict that 2024 could be similar.

The reality of the urban heat island

- Temperatures in large, crowded urban settings can be several degrees higher than in surrounding rural areas and even hotter at night.
- Concrete structures and tarmac roads retain heat which stays trapped inside this urban bubble along with air pollutants.
- A lack of green spaces and waste heat from air conditioners and other machinery add to the UHI.
- In India, a heatwave is officially declared in coastal areas when the maximum temperatures are over 37° C and 4.5° C above normal.



Heat Action Plans

- India has national, State and even some district-level Heat Action Plans (HAP) to reduce morbidity and mortality, especially among vulnerable poor, infants, elderly.
- The National Disaster Management Authority (NDMA) Guidelines, outline measures to deal with heatwaves including early warning bulletins, - and staggered work hours at outdoor construction sites, with shaded areas etc.
- Besides such post facto responses to heatwaves, longer term measures are needed to deal with UHI and reduce urban heat.
- For instance, the Chennai Climate Action Plan (CCAP) offers several meaningful suggestions including those discussed here, albeit scattered under different sections.

A study and findings

- Increasing green cover. Green areas such as urban forests, large greens and parks, avenue and other trees, release moisture which evaporates and cools the environs.
- Well-distributed green areas also influence local micro-climate, reduce air pollution, and promote health and well-being.

- Tree-lined and shaded walkways and tracks provide pedestrians, cyclists and itinerant workers shelter from blazing sun, and encourage non-motorised transportation.
- Sustainable urban development by UN Habitat, recommends that green spaces be available for all citizens within 400 metres from their residence.
- The area under the urban cities is greener, with promising initiatives such as “miyawaki forests”, although questions remain about the species planted.

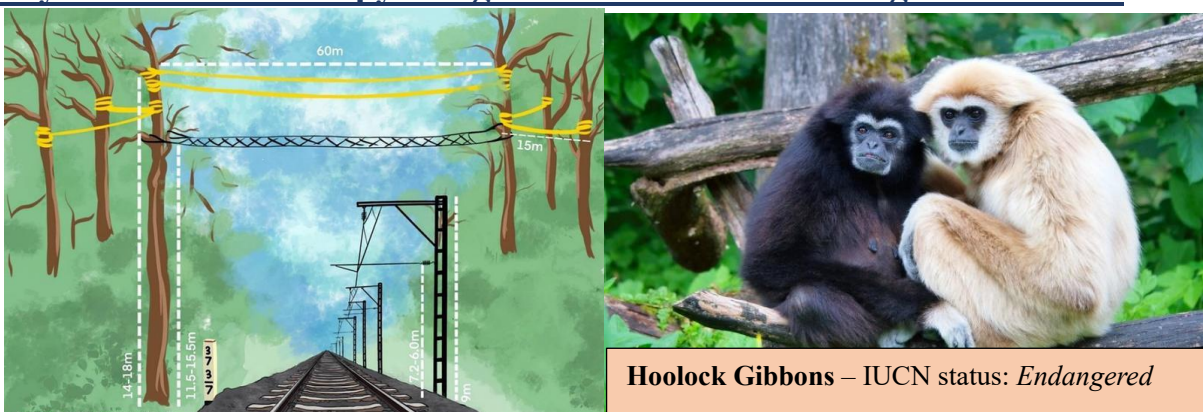
On the use of air-conditioners, energy saving

- A less understood factor behind UHI is waste heat from air-conditioning.
- In Chennai, as in other Indian metros, roughly 50% of electricity consumption during summer is for air-conditioning alone, which vent heat out.
- It is estimated that moving towards more energy-efficient (EE) air-conditioning, through a combination of mandates for the purchase of five-star or
 - split EE air-conditioners and incentives for the exchange of older air-conditioners for new EE units could reduce UHI by as much as 1.5° C.
- Cities such as Shanghai and Seoul have reported a significant reduction in UHI through such strategies.

Way forward

- Greater consciousness about climate change would help but savings of roughly 25% on electricity charges, would also act as a powerful driver of change.
- If buildings are better insulated and ventilated, and constructed using appropriate designs and materials according to green building codes,
 - they would require less air-conditioning and generate less waste heat.
- Having permeable paving and walkways, increased shrubbery along sidewalks, berms and dividers, and reflective paint on roofs, walls and streets can help.
- A sharp reduction in personal vehicles, through a rapid scaling-up of effective public transport with electric buses, would be another major contribution.

Railways to construct canopy bridges across track in Assam gibbon habitat



Hoolock gibbons and conservation

- The Northeast Frontier Railway (NFR) has earmarked funds to construct canopy bridges for India’s only ape to move across a railway track in eastern Assam.
- A 1.65-km-long track set to be doubled and electrified divides the 2,098.62-hectare Hollongapar Gibbon Sanctuary in Jorhat district.

- The sanctuary has the largest concentration of the Hoolock gibbon, one of 20 species of apes on earth.
- The gibbon, known for its vocalisation, spends much of its time on the upper canopy of tall trees, mostly the hollong (*Dipterocarpus macrocarpus*).

Canopy bridges

- The fragmentation of the forest along the track has disturbed the arboreal nature of the ape, putting it at risk while crossing the track.
- These canopy bridges are designed by the WII in consultation with the NFR, at identified points to facilitate easy movement of the arboreal species.
- As a fail-safe mechanism, safety nets will be installed below the main twin-rope bridge to save the species accidentally falling off the bridges.
- The canopy rope bridges will be installed in such a way that lianas and creepers can be guided along them to make the bridges look as natural as possible.

April core sector output rises 6.2% as electricity, steel buoy

- India's infrastructure (core sector) output in April rose 6.2% y-o-y, quickening from a revised 6% growth in March, backed by strong electricity and steel output.
- Infrastructure output, which accounts for 40% of industrial production, measures activity in eight sectors, including refinery products and electricity.
- Coal production grew 7.5%, while electricity generation rose 9.4%. Steel production grew 7.1% and natural gas output registered a growth of 8.6% in April.
- Cement production rose 0.6% in April year-on-year, and Crude-oil production rose 1.6% in April.
- All sectors but fertilizers grew. Fertilizer production registered a fall of 0.8% in April, while refinery products rose 3.9%, against a 1.5%.

Splash back

News context

- A start-up named Agnikul Cosmos successfully conducted the first test flight of its rocket 'Agnibaan' in a mission called 'Suborbital Tech Demonstrator' (SOrTeD).
- The flight was Agnikul's fifth attempt after the first four were called off owing to suboptimal launch conditions.

Agnibaan – a look

- 'Agnibaan' is a two-stage, 14-tonne launch vehicle designed to lift small satellites to low-earth orbits. Both stages are powered by bespoke semi-cryogenic engines.
- Its success will expand India's commercial launch services offering in keeping with the expanding market for small satellites and the services they can provide.
- The roster is currently dominated by the Polar Satellite Launch Vehicle (PSLV) and will soon be by the Small Satellite Launch Vehicle, both of ISRO.



Way in advancements and forefront

- One blip Agnikul will have to address is the subpar communication of the parameters of the test flight.
- Likewise, these startups are poised now to light the way for ISRO and others, potentially accelerating innovation in the sector.
 - For example, ISRO has been testing a semi-cryogenic engine of its own that could draw from lessons learnt at Agnikul.
- ISRO said it had developed engine nozzles made of a carbon-carbon composite to replace the Columbian alloy nozzles on the PSLV's fourth stage.
- The government must ensure that the corresponding bureaucratic and legal frameworks encourage the free flow of knowledge.