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Chennai's mega carbon footprint

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CUT DOWN EMISSIONS by adopting sustainable construction methods and switching to renewable power sources.

Chennai emerges as India's No. 1 greenhouse gas emitter in a study done among seven major cities. Poor city and building design is the main culprit.

Chennai has another first to its credit. This time, for all the wrong reasons. A recent study in *Renewable and Sustainable Energy Reviews* by the Indian Institute of Science (IISC) reveals that the city tops in per capita greenhouse gas (GHG) emissions among seven cities — Delhi, Hyderabad, Bangalore, Ahmedabad, Kolkata and Mumbai.

Dr. T.V. Ramachandra of the Centre for Ecological Sciences, who headed the study, says various factors contribute to GHG emissions in a city, leading to global warming. "Due to poor public transport, our cities rely on private vehicles and this contributes to high emissions. Other factors include relying on thermal power, waste mismanagement and poor architectural practices," he says. High rises with glass facades that don't suit India's tropical climate are common today. This has increased electricity consumption. "In a zone with minimal high rise structures, the per capita/per year electricity consumption is about 1,300-1,500 units (kWh), while in zones with higher density, the per capita/per year consumption is as high as 14,000-17,500 units. This mirrors flawed architecture adopted by our builders," adds Dr. Ramachandra.

Ajit Kumar Chordia, president, CREDAI Chennai, says high volume of vehicle traffic, the presence of power plants in the vicinity, and the many industrial belts have led to high emissions. "Old buildings with poor fenestration and insulation, poorly maintained air conditioning and lighting systems without IBMS (Integrated Building Management System) are power guzzlers. We need to retrofit technologies in old and existing buildings and ensure they consume less power." Dr. R. Kumar, managing director, Navin Housing and Properties, says poor city planning can contribute in a major way towards GHG emissions. "We need to reduce our travel needs and encourage the walk-to-work concept. Mass transportation should be given priority."

The choice of construction material is crucial to determine the carbon footprint of a building. The focus should be on using efficient, cost-effective material that will increase the lifecycle of the building and result in lower emissions.

Chennai is also a top contributor to industrial pollution due to its fertilizer and petrochemical industries, which result in huge volume of GHG emissions, says A. Shankar, national director, JLL. "We need to identify small and mid-scale polluting industries, especially within the city, and follow up with policy-level decisions for their appropriate relocation."

How can one ensure that projects have a low carbon footprint? "Aligning construction and building operations to a certified green rating system will ensure minimum use of passive design techniques. Sourcing material locally will also reduce carbon footprint," says Shankar. Kumar adds, "Manufacturing industries must upgrade their technology to minimise use of fossil fuels. Also, the chemicals used in some of the processes have to be fuel-efficient. Developers must use eco-friendly material. For instance, green buildings advocate the use of certain kinds

of paints and refrigerants.”

Dr. Ramachandra says a green rating helps, provided it is based on the life cycle assessment of a product or environment auditing . “Current practices are misleading. For example, platinum ratings by LEED/ GBCI for high rises with glass facades reflect the ignorance of the agency on key environment issues.” Chordia adds, “Green rating is one of the tools that sensitises developers to aspects of sustainability and they consciously choose material that produce lower emissions. The focus should later shift to reducing embedded carbon in projects.”

It is essential to first strengthen GHG emission mitigation strategies at the national and city levels. Shankar says governments across the world use incentives such as capital subsidy, grants, subsidised loans and rebates to encourage building owners and occupants to invest in energy-efficient measures and equipment. “On an individual level, increased awareness is required to highlight the benefit of energy-efficient household appliances. In India, the green rating system isn’t very helpful, as most systems are far from the local context. We need to go beyond these rating systems to truly make the project sustainable and meaningful,” he says.

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