



ENERGY INEFFICIENCY IN CONSTRUCTION SECTOR - GS III MAINS

Q. India's booming construction sector presents both economic prospects and enhanced living conditions, yet it also presents notable environmental hurdles. Critically analyse (15 marks, 250 words)

News: *On sustainable building materials | Explained*

What's in the news?

- India's booming construction sector presents both economic prospects and enhanced living conditions, yet it also presents notable environmental hurdles. In this context, tackling energy inefficiency in residential buildings becomes imperative.

Importance of Addressing Energy Inefficiency in India's Construction Sector:

1. Rising Energy Demand and Urbanization:

- India's economic growth and urbanization have led to a surge in energy and cooling demand.
- Increased urbanization, coupled with the phenomenon of heat islands, exacerbates the need for energy-efficient buildings.

2. Environmental Impact:

- The construction sector is a significant contributor to energy consumption and greenhouse gas emissions.
- Addressing energy inefficiency is essential to mitigate environmental degradation and combat climate change.

3. Thermal Comfort and Well-being:

- Energy-efficient buildings offer improved indoor air quality, thermal comfort, and natural lighting.
- Enhancing occupant well-being and comfort is crucial for sustainable urban development.

Initiatives Regarding Energy Efficiency in the Construction Sector:

1. Eco-Niwas Samhita (ENS):

- Introduced by the Ministry of Power, ENS promotes energy efficiency in residential buildings through the Energy Conservation Building Code for Residential Buildings (ECBC-R).
- Focuses on optimizing building design and construction to reduce energy consumption and environmental impact.

2. Energy Conservation Building Code (ECBC):

- Set by the Bureau of Energy Efficiency, ECBC establishes minimum energy standards for commercial buildings.
- Aims to achieve significant energy savings and promote renewable energy integration in building design and operation.



3. Energy Conservation (Amendment) Act, 2022:

- Transitioning ECBC into the Energy Conservation and Sustainability Building Code to incorporate measures for sustainability and clean energy deployment.
- Mandates compliance with ECO Niwas Samhita for residential building energy efficiency.

4. NEERMAN Awards:

- Recognizes buildings compliant with ECBC standards, encouraging energy-efficient construction practices.
- Part of the 'Azadi Ka Amrit Mahotsav' initiative to promote sustainable development.

5. BEE Star Rating for Buildings:

- Evaluates energy efficiency in commercial buildings through a star rating system.
- Encourages building owners to adopt energy-efficient practices and technologies.

6. Green Rating for Integrated Habitat Assessment (GRIHA):

- National rating system for green buildings adopted by the Ministry of New and Renewable Energy.
- Promotes sustainable building design and construction practices to minimize environmental impact.

7. Indian Green Building Council (IGBC):

- Facilitates sustainable built environment initiatives in collaboration with the Confederation of Indian Industry.
- Aims to position India as a global leader in sustainable construction by 2025.

Way Forward:

1. Utilization of Autoclaved Aerated Concrete (AAC) Blocks:

- AAC blocks offer superior thermal efficiency compared to traditional materials like red bricks and monolithic concrete.
- Promoting the use of AAC blocks can enhance energy efficiency and reduce cooling demand in buildings.

2. Exploration of Innovative Building Materials:

- Collaboration with sustainability experts to explore and adopt innovative building materials.
- Emphasis on materials with low embodied energy and high thermal performance for sustainable construction.

3. Addressing Sustainability Concerns:

- Awareness and action on high embodied carbon materials like monolithic concrete.
- Encouragement for manufacturers to develop sustainable and resilient building solutions.



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4. Promotion of Sustainable Practices:

- Adoption of cost-effective and durable building materials to improve energy efficiency and environmental sustainability.
- Cultivation of a culture of sustainability in the construction industry.

5. Adoption of Smart Building Systems:

- Integration of smart building systems, artificial intelligence, and IoT technologies to optimize energy consumption.
- Deployment of intelligent HVAC systems and 3D printing for energy-efficient building components.

