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**EDITORIAL ANALYSIS**

# Built Against Cold, Not Heat: Redesigning Buildings for a Warming World

 **DOWN TO EARTH**

5 July 2026

**ENVIRONMENT****GS3****GS1**

CURATED &amp; WRITTEN BY

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# Built Against Cold, Not Heat: Redesigning Buildings for a Warming World

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**GS3**
**GS1**

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## THE LIFT LINE

We spend most of our lives indoors, yet our buildings are frozen in the climate of the year they were designed for; a house built to hold warmth becomes an oven when the world heats up, and much of the planet's building stock, India's included, is now fighting the wrong war.

## WHY THIS EDITORIAL MATTERS FOR YOUR EXAM

This editorial turns climate adaptation into a concrete, buildable policy question, exactly the applied angle UPSC prefers over abstract warnings. It links the physics of heat to codes, urban design and energy demand, spanning GS3 and GS1.

**GS Paper 3:** Conservation, environment and climate change; energy and its conservation; infrastructure. The Energy Conservation Building Code and cooling policy are directly examinable.

**GS Paper 1:** Geography, climatology and the built environment; important geophysical phenomena; urbanisation and its problems.

## BACKGROUND AND CONTEXT

Building design is climate-specific. Cooler regions, historically temperate Europe, hill states, high-latitude cities, evolved buildings that **trap and retain heat**: dark roofs, heavy insulation to hold warmth, small windows, limited ventilation, and until recently little air-conditioning. That logic served a cold-dominated risk.

Climate change has inverted the risk. Successive record heatwaves have baked exactly these regions, and homes built to keep warmth in now cannot shed it. The result is dangerous indoor overheating, a surge in retrofit air-conditioning (which worsens the urban heat-island and emissions loop), and heat mortality among

the elderly and poor who lack cooling.

India's own building stock is split. Traditional vernacular architecture, thick walls, courtyards, jaalis, shading, was heat-smart, but modern concrete-and-glass construction often ignores it, and hill and temperate zones design mainly against cold. India's principal tool is the **Energy Conservation Building Code (ECBC)**, launched in 2007 and updated in 2017, administered by the Bureau of Energy Efficiency. It sets standards for large commercial buildings across five climate zones and includes cool-roof reflectance norms, shading and passive-design provisions, with ECBC, ECBC Plus and Super ECBC tiers (roughly 25, 35 and 50 per cent-plus energy savings). A residential code (Eco Niwas Samhita) extends the logic to homes.

## THE CORE ARGUMENT / ISSUE

The central argument: **a warming climate demands heat-adaptive building design, and codes must shift from cold-era and energy-only thinking to thermal-safety-first design.**

### Passive before active

The cheapest, cleanest cooling is the heat you never let in. Passive strategies, orientation, shading, cross-ventilation, thermal mass, reflective (cool) roofs and cool walls, courtyards and insulation tuned to keep heat out, can cut indoor temperatures by several degrees before a single air-conditioner switches on. Active cooling should be the last layer, not the first.

### The cool-roof lever

A cool roof reflects sunlight and re-radiates heat, lowering roof-surface and indoor temperatures markedly; at scale it also cools the surrounding city. It is among the lowest-cost, highest-impact interventions, and India has begun mandating cool roofs in several state heat action plans and cities.

DESIGN LAYER	COLD-ERA LOGIC	HEAT-ADAPTIVE LOGIC
Roof	Dark, heat-absorbing	Cool, high-reflectance
Insulation	Trap warmth in	Keep heat out; night-flush ventilation
Windows	Small, sealed	Shaded, operable, cross-ventilated
Cooling	Passive heating	Passive cooling first, AC last
Urban form	Compact, wind-sheltered	Green cover, reflective surfaces, airflow

### The gaps

ECBC is powerful but binds mainly large commercial buildings; enforcement rests with states and municipal bye-laws, which adopt and inspect unevenly. Small buildings, homes and the vast informal stock, where the poor face the worst indoor heat, are largely outside effective code. And traditionally cool regions have the

weakest heat-design culture precisely as they warm fastest.

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## HOW TO THINK ABOUT THIS (ANALYTICAL FRAME)

The frame is **path dependence in the built environment**. Buildings last 50 to 100 years; they lock in the climate assumptions of their design date long after the climate has moved on. This is “adaptation lag”: the world warms in years, but the building stock turns over in decades. The sharp move is to intervene at the two low-cost moments, at the design of new buildings (through codes) and at renovation (through retrofits and cool-roof programmes), because retrofitting a badly-designed building later is far costlier than designing it right once. Ask of any long-lived infrastructure: for which climate was it built, and is that climate still coming?

## THE DIAGRAM IN WORDS

Historic climate (cold-dominated) -> buildings designed to trap heat (dark roofs, heavy insulation, sealed windows) -> climate warms, heatwaves intensify -> heat-trapping buildings overheat -> retrofit AC surge -> higher emissions + urban heat island + heat mortality -> intervene at design (heat-adaptive codes, ECBC/Eco Niwas) + retrofit (cool roofs, shading, passive cooling) -> lower indoor heat, less AC, cooler cities -> climate-resilient building stock.

## WAY FORWARD

- ① **Make heat-safety a code objective.** Evolve ECBC and Eco Niwas Samhita from energy-only toward explicit indoor thermal-comfort and heat-safety standards, and widen coverage to homes and smaller buildings.
- ② **Scale cool roofs.** Mandate (<https://ujjiyari.com/vocab/mandate/>) high-reflectance roofs in city bye-laws and heat action plans, with subsidised cool-roof programmes for low-income housing.
- ③ **Revive climate-responsive vernacular.** Codify (<https://ujjiyari.com/vocab/codify/>) passive design, orientation, shading, ventilation, thermal mass, courtyards, into mainstream construction, not just heritage.
- ④ **Enforce at the municipal last mile.** Build state and city capacity to adopt, inspect and certify code compliance, the weak link today.
- ⑤ **Retrofit the existing stock.** Fund heat retrofits for public buildings, schools and hospitals, and the poorest housing, where overheating is deadliest.

## PYO LINKAGE AND PRACTICE

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UPSC has asked on urban heat islands, on heatwaves as a disaster-management and public-health challenge, and on energy efficiency in buildings. The current angle, building design as climate adaptation, connects the physics of heat to codes and urban form.

**Practice Mains question (GS3, 250 words, 15 marks):** “Much of our building stock is designed for a climate that no longer exists.” Discuss the need for heat-adaptive building design and codes in a warming India, and evaluate the role of passive cooling, cool roofs and the Energy Conservation Building Code in reducing indoor heat and cooling energy demand.

*Sources: Down To Earth (<https://www.downtoearth.org.in>)*

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