City Actions to Tackle Extreme Heat

BEBRIT
Extreme Heat Risk Project

BUILDINGS

Ancient Terracotta Air Coolers

In **India**'s record-breaking heat, ancient terracotta air coolers are making a comeback. Cookbook author Nandita Iyer uses a matka, a traditional terracotta pot, to keep water cool. This technique dates back over 3,000 years to the Harappan civilization. Modern adaptations, like those by architect Monish Siripurapu, use terracotta for cooling buildings by pumping recycled water over it. This ancient practice is now vital for combating extreme heat in India.

CoolAnt's 'Beehive' design is based on the principles of evaporative cooling and natural ventilation – Source: Ant Studio

Cooling Home Innovations

Drawing inspiration from Morocco and southern Europe offers practical solutions. Moroccan **riads, with their courtyards and water features**, effectively cool surrounding areas, while strategic use of shade and ventilation mitigates solar gain. **External shutters, overhangs, and light-coloured walls** reduce heat absorption. Shutters alone can reduce heat mortality by 38% to 73%. **Iranian traditional windcatchers** draw in fresh air for natural cooling, a technique that can be replicated. **Ivy-covered buildings** in Italy provide cooling benefits through shade and evapotranspiration, reducing UHI effect. Ivy and other climbing plants offer natural insulation, cooling in summer and retaining warmth in winter. Integrating these elements into northern homes can manage heat effectively.

Cooling Systems

Munich is taking significant strides in its climate commitment through the expansion of district cooling systems, which are designed to **replace individual air conditioning units**. This initiative, spearheaded by Stadtwerke München (SWM), focuses on reducing energy consumption by **utilizing groundwater and city streams for cooling**. By shifting from individual systems to a centralized approach, Munich aims to enhance energy efficiency and support its broader environmental goals.

Traditional Architectural Renaissance

For centuries, **India**'s architecture featured intricate lattice structures. Now, as modern architects search for better ways to keep buildings cool, these designs are making a comeback. The Microsoft office in Noida, India, exemplifies this revival with its jaali-inspired architecture. These perforated lattice screens, reminiscent of the Taj Mahal, blend aesthetic appeal with functionality, allowing natural light while reducing heat. By employing jaali, architects achieve energy efficiency and reduce the carbon footprint, earning sustainability certifications like the LEED platinum rating. This approach signifies a return to passive cooling techniques, crucial for addressing the modern climate crisis and reducing reliance on energy-intensive air conditioning.

In their search for sustainable cooling solutions, architects are reviving jaali design, which dates back to the 16th Century
Source: Getty Images

Simple Cooling Solutions

Source: Mitul Kajaria

Extreme heat impacts **Indian** slums, where temperatures can reach 47.8°C. Women like Pinky, a member of the Bhil tribe, combat this by applying white solar reflective paint to their roofs. This simple solution, promoted by the Mahila Housing Trust (MHT), effectively cools homes, improving health and productivity.

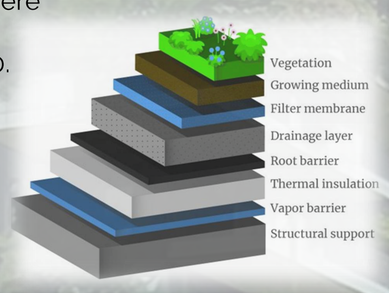
The Cooling Charm of Skywells

In pre-air-conditioning eras, skywells in **southern China** cooled homes naturally. Ru Ling, fond of these airy, cool courtyards, lived in a century-old house in Anhui from 2014 to 2021, appreciating the refreshing, zen vibe. Studies show skywells can lower temperatures by up to 4.3°C. As urbanization grows, interest in traditional architecture, including skywells, is reviving, inspiring low-carbon, cooling designs for modern buildings.

Wuyuan Skywells Hotel

Estimating the Environmental Effects of Green Roofs

The EPA's case study on **Kansas City's green roofs** highlights their substantial environmental benefits. With over 700,000 ft² of green roofs installed from 1999-2020, emissions of nitrogen oxide, sulfur dioxide, and carbon dioxide were notably reduced, leading to **health benefits** valued at $35,500–$80,500.

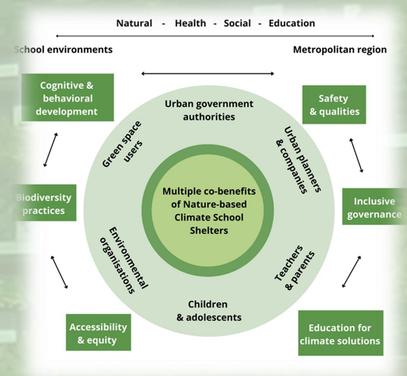


Sustainable Building Materials that Help Keep Buildings Cool

Bamboo: A renewable resource with natural insulating properties.
Hempcrete: Made from hemp fibres and lime, it offers excellent thermal insulation.
Cork: Sustainable, renewable, and provides excellent thermal and acoustic insulation.
Straw Bales: Highly insulative and made from an agricultural byproduct.
Rammed Earth: Uses natural earth materials, providing high thermal mass.
Wool Insulation: Natural, renewable, and effective at regulating temperature.
Recycled Wood: Repurposed wood that provides good insulation and reduces waste.
Adobe: Made from natural clay and straw, offering high thermal mass.
Living Walls: Vegetated walls that provide natural cooling through evapotranspiration.

COOLSCHOOLS Nature-Based Solutions

The COOLSCHOOLS project (March 2022-February 2025) explores nature-based **climate shelters in schools**, focusing on how these solutions enhance community health and well-being. By integrating the needs of children and youth, COOLSCHOOLS aims to transform urban environments through nature-based solutions, studying their impact on social justice, biodiversity, and public health. It builds on European initiatives, with **Brussels**' school greening project serving as a key testing ground for innovative, participatory approaches.



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