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Hixon Center for Urban Sustainability

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Cities in Action: Expert Conversations for Urban Heat Solutions

Speakers:

Prathijna Poonacha Kodira
Indian Institute for Human Settlements

Narasimha Rao
Yale School of the Environment

Moderator:

Katharine Mach
University of Miami

Problem Setting

As cities continue to grow, the combined loss of cooling green spaces and expansion of heat-absorbing infrastructure are intensifying the impacts of climate change. An estimated 1.7 billion people globally are exposed to extreme heat, resulting in more deaths than any other weather-related hazard. While the challenges are immense, so are the opportunities. Innovative strategies for mitigating and adapting to urban heat, such as nature-based solutions and built-environment interventions, can create cooler cities. Prathijna Poonacha Kodira and Narasimha Rao provided insights to this discussion, with moderation from Katharine Mach.

Key Takeaways

1. Urban heat remains an invisible killer

Urban heat remains an unseen and often unaddressed hazard, ranging from intense heat waves to prolonged seasonal exposure. Yet, as Mach explained, policy responses rarely reflect this full spectrum. Exposure differs across communities based on time spent in public spaces, on the job, at home, or in the built environment. Existing vulnerabilities can be compounded, driving up health risks. There is a crucial need to tailor interventions that recognise these different levels and types of exposure.

2. Heatwaves lead to cascading impacts

Understanding morbidity from heat impacts is critical, Kodira shared. These health burdens can set off a chain reaction that reduces productivity. The urban heat island effect exacerbates these risks by making some neighborhoods significantly hotter than others. Poor building quality and insufficient availability of air conditioning worsen these inequalities, Rao added. As a result, low-income households face additional risks, such as temperatures that are higher indoors than outdoors, with limited resources to adapt.

3. Heat action planning saves lives

Addressing heat risks necessitates fundamental structural changes in city planning and design. Preparing data-driven, comprehensive guiding documents is a crucial step in transforming urban landscapes. According to Kodira, heat action plans are critical lifelines for reducing vulnerability, but their effectiveness depends on localised adaptation. She further asserted that these plans must be developed through collaboration with municipal agencies, community leaders, and vulnerable populations. This can ensure that interventions are aligned with on-the-ground realities.

4. A multi-pronged approach can tip the balance toward urban transformation

Both incremental and transformative approaches may be necessary for creating cooler and more resilient urban spaces. Incremental actions offer more immediate relief. Examples include adjusting work and school hours and applying reflective coatings to roofs. However, these strategies are insufficient for creating structural change. Rao enumerated more transformative approaches, like legal protections for green and blue spaces and amendments to building codes to require passive cooling.

Extreme heat can exacerbate household energy burdens

Informal settlement upgrading in Odisha, India

Implementation Examples

Residential Extreme Heat

Many households face disproportionate challenges in reducing indoor heat while managing energy costs. Recent research by Mach underscores the complex interplay between residential heat and energy burdens, revealing how their combined effects can pose significant risks to households. In hot cities, these risks are unequally distributed and shaped by socioeconomic factors.

Priority Action:
Integrate mitigation & adaptation

Transformative change demands the integration of heat adaptation and mitigation strategies into mainstream development efforts. Currently, mitigation tends to be addressed at the international level, while adaptation remains a local concern—often with limited coordination across different levels of governance. To save lives in rapidly growing cities, it is essential to break down institutional silos and prioritised solutions that also advance poverty reduction. These include rethinking building design to support passive cooling through the use of local materials, increased greenery, and smarter decisions around urban density.

JAGA Mission in India

The Odisha Liveable Habitat Mission ("JAGA Mission") was began as a slum titling project in 2017 and has evolved into India's largest informal settlement upgrading initiative. The Mission has formalised land rights for over a million urban poor. It provides informal settlements with access to essential social services and resources. It also supports the relocation of high-risk informal settlements through a participatory process.

Kodira explained how the initiative addresses urban heat through upgrading strategies that combine infrastructure innovation and community-led design. It incorporates heat-resistant urban features into roads, stormwater drainage, and green open spaces. These improvements are critical for lowering surface temperatures and mitigating extreme heat events.

Further Resources

- Watch the full conference panel discussion here
- Follow Indian Institute for Human Settlements (IIHS) on Instagram, LinkedIn, Facebook, and X (Twitter), and the Hixon Center for Sustainability on LinkedIn, for more conversations like this.
- Learn more about Prathijna Poonacha Kodira's work here.
- Check out the Hixon Practitioner Toolbox for more resources like this

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