



## SUMMARY: CitiesIPCC Scientific Steering Committee Commissioned Papers

*Note: These papers represent the views of the authors and do not represent the official position of CitiesIPCC.*

### [Towards a Novel Assessment Framework for Cities and Climate Change](#)

*William Solecki, Cynthia Rosenzweig, Debra Roberts, Seth Schultz*

- Many major climate assessments have been conducted in recent years at global, national, and regional scales. Some of these focus on a wide range of topics, while others focus on a particular area such as oceans or biodiversity.
- This paper analyses these assessments and provides recommendations on ‘moving forward on novel urban assessments.’ The paper suggests that to ensure the necessary knowledge base for climate action is available to all cities, it is essential to tailor research to multiple sets of stakeholders and their needs, and, additionally, strengthening ‘science-policy linkages and the role of city science partnerships’ by creating a continual dialogue.

### [Responding to climate change in cities and in their informal settlements and economies](#)

*David Satterthwaite, Diane Archer, Sarah Colenbrander, David Dodman, Jorgelina Hardoy and Sheela Patel*

- One of the greatest challenges for climate change adaptation is how to build resilience for the billion urban dwellers who are estimated to live in what are termed “informal settlements” – sites chosen by their residents because they are less likely to be evicted as the land is unattractive to developers. Many informal settlements are on land sites at high risk from flooding and landslides.
- A major challenge for climate adaptation in these informal settlements include the many ways in which these settlements break laws and contravene regulations, complicated by the fact that in many nations, local governments ignore those living in informal settlements or evict them. If urban governments do commit to building resilience they can be hampered by limited technical capacity, lack of funding and political constraints.
- This paper examines the vulnerability of informal settlements and economies, and describes how lessons from upgrading informal sectors and linking informal and formal economies can help to ensure that these become more resilient and contribute (as appropriate) to lower greenhouse gas emissions in the coming decades.

## **Financing Low-Carbon, Climate-Resilient Cities**

*Sarah Colenbrander, Michael Lindfield, Joseph Lufkin and Nastassja Quijano*

- In many parts of the world, urban development is becoming more inefficient, unsustainable, and carbon-intensive. Urban spatial expansion is outstripping urban population growth and the share of urban trips by private vehicles is increasing in all developing regions. Meanwhile, millions of urban residents lack access to risk-reducing infrastructure and services, such as sewers, piped water, drains, waste collection or healthcare.
- A transition to low-carbon, climate-resilient cities will require both a substantial increase in the total quantity of urban infrastructure investment, and a shift in financing. There is a need for innovation, learning and scaling of financing instruments, financial architecture and governance structures.
- This paper outlines how cities and countries can enhance fundamental financial capabilities and systemically mainstream climate commitments into financial decision-making.

## **Urban Climate Change Science, Impacts and Vulnerabilities: State-of-the-Art Findings and Key Research Gaps**

*Cynthia Rosenzweig, William Solecki, Patricia Romero-Lankao, Shagun Mehrotra, Shobhakar Dhakal, Somayya Ali Ibrahim*

- A climate change signal is now embedded in the everyday weather of cities and their long-term climate trends. A central question is what are the interactions between climate change, urban climate, and urban areas, e.g. local precipitation patterns, heat waves and more complex interactions with urban heat islands?
- Urban systems are highly interconnected, and increasing climate extremes can lead to cascading failures.
- Climate change interacts with ongoing and often pervasive environmental stresses and threats found in urban environments, most significantly between ongoing air quality challenges in urban and climate change contexts.
- Vulnerability reflects exposure and adaptive capacity when facing extreme events and climate disasters and risks, as well as more systemic risk contexts where climate vulnerabilities intersect with ongoing social and economic inequities. Topics related to key climate change vulnerabilities are disasters and risk, equity and environmental justice, and the health of urban populations.
- The research-practitioner community has entered into a period of rapid data availability and needs growth as well as data and information translation and application needs.

## **Upscaling Urban Data Science for Global Climate Solutions**

*Felix Creutzig, Steffen Lohrey, Xuemei Bai, Richard Dawson, Shobhakar Dhakal, William Lamb, Timon McPhearson, Jan Minx, Esteban Munoz, Brenna Walsh*

- Cities have an increasingly integral role in addressing climate change and maintaining quality of life. To understand solutions, we require adequate urban area data related to GHG emissions, climate threats and socio-economic contexts.

- This paper outlines three routes for upscaling urban data science for global climate solutions: 1) Mainstreaming and harmonizing data collection in cities worldwide; 2) Exploiting big data to build scalable solutions while maintaining privacy; 3) Using high-resolution remote sensing data to automatize computation of first-order climate effects and solutions.
- Even without crucial background data, cities should share their knowledge and experiences on climate solution strategies. Collaborative efforts towards a joint data platform would provide the quantitative foundations of an emerging global urban sustainability science.

**Notes:**

**For Information about the CitiesIPCC Cities and Climate Change Science Conference visit:**  
<https://citiesipcc.org/>