

The urban impacts of climate change: introduction

Simon Goldhill and Georgie Fitzgibbon

Abstract: Climate change is a global phenomenon that significantly impacts urban life. Rising global temperature causes sea levels to rise, increases the number of extreme weather events such as floods, droughts, and storms, and increases the spread of tropical diseases. All these have costly impacts on cities' basic services, infrastructure, housing, human livelihoods, and health. At the same time, cities are a key contributor to climate change, as urban activities are major sources of greenhouse gas emissions. This special edition explores a range of climate change impacts in urban areas, the possibilities of adaptation and mitigation in different contexts, and the development of public participation and climate action.

Keywords: Climate change, urban, cities, adaptation, mitigation, informality, vulnerability.

Notes on the authors:

Simon Goldhill is Professor of Greek at the University of Cambridge, and a Fellow of King's College, Cambridge. He was elected a Fellow of the British Academy in 2016, and currently serves as Foreign Secretary & Vice-President of the British Academy.

Dr Georgie Fitzgibbon is International Policy Adviser at the British Academy.

As the UN Environment Programme (UNEP) states, climate change is a global phenomenon that significantly impacts urban life. Rising global temperature causes sea levels to rise, increases the number of extreme weather events such as floods, droughts, and storms, and increases the spread of tropical diseases. All these have costly impacts on cities' basic services, infrastructure, housing, human livelihoods, and health. At the same time, cities are a key contributor to climate change, as urban activities are major sources of greenhouse gas emissions. Estimates suggest that cities are responsible for 75 per cent of global CO₂ emissions, with transport and buildings being among the largest contributors.¹

The built environment is fundamental to many of the themes of COP26. It has a critical role to play in mitigating climate change, responsible for 39 per cent of energy-related CO₂ emissions. It is also central to building resilience against climatic extremes too late to avoid, through nature-based solutions. It is key, also, to the aspiration of building back better after COVID.

This special issue explores a range of climate change impacts in urban areas, the possibilities of adaptation and mitigation in different contexts, and the development of public participation and climate action.

In the first article Soledad Garcia Ferrari *et al.* (2021) consider strategies oriented to co-production which have contributed to providing solutions in low-income, vulnerable urban areas to meet some of the basic unmet needs, mostly in relation to providing infrastructure and services. However, such strategies have not been comprehensively explored in relation to needs exposed to climate change risks, such as flooding and droughts. This article draws on experiences in growing, vulnerable urban areas in two Latin American cities, Medellin in Colombia and Puebla in Mexico, which are experiencing increasing climate-change-driven risks. This research provides insights into the opportunities generated by co-produced strategies for climate change risk mitigation and adaptation in two different low-income, urban contexts. The article explores how addressing the relationship between power and knowledge created at a range of geographical scales and including different actors in low-income and vulnerable urban areas, can provide a useful framework to identify and implement solutions aimed at mitigating climate change risks.

Next, Xavier Lemaire (2021) focuses on cities in sub-Saharan Africa which are on the front line of climate destabilisation and migration. These cities have to deal with more intense flash floods, land degradation and erosion, droughts, and heatwaves affecting in particular the poor living in informal settlements. Strategies on how to adapt and move to more resilient cities are being designed. But the question is how

¹UNEP, Cities and Climate Change: <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/cities/cities-and-climate-change>

this transition can be achieved while municipalities in sub-Saharan Africa are facing such difficulties in coping with demographic growth, budget scarcity, and poor governance. Most local authorities in sub-Saharan Africa have constantly failed to address the fundamental basic needs of communities, even before the current acute environmental crisis. This article analyses the persistent urban planning bias preventing transition to sustainability, and considers emerging alternative strategic options promoting resilience and inclusivity while moving toward low-carbon cities, and how the discourse on post-COVID cities is relevant to the context of urban Africa.

Minna Sunikka-Blank *et al.* (2021) also explore African cities. Like many countries of rapid urbanisation, Ethiopia has an acute low-income housing shortage. Ethiopia's Integrated Housing Development Programme (IHDP) can be seen as an attempt to innovate low-income housing provision. Over 200,000 IHDP units have been built since 2005. Drawing from a Post Occupancy Evaluation (POE) survey in Amhara region, this article asks how the transition to high-rise has affected household practices and energy use. The POE survey shows low satisfaction among residents, despite energy access and sanitary facilities. The new built environment compromises and contradicts established cultural practices, reducing the residents' well-being compared to previous living in more informal settlements where the dwelling had direct access to outdoor space and community. This means that the residents tend to view IHDP housing as transitional, disincentivising improvements in the environment or social networks. Further, the loss of ground connection causes domestic and cultural practices to move indoors, increasing energy demand and reliance on appliances. This article argues that high-rise as the only typology for mass housing should not go unchallenged. If it is the only option, design standards should not be left open to interpretation by the developer and regulations should ensure adequate design, including dual aspect, flexibility and privacy in floor plans, and design and designation of outdoor spaces. The findings question the idea of modernisation of housing as a linear process and challenge the literature on the compact city model as *the* paradigm for sustainable cities in Southern urban practice.

The contribution by Cristian Silva (2021) outlines an approach to the analysis of interstitial spaces of urban sprawl. Such spaces are the outlying geography of metropolitan regions existing in-between developed or urbanised areas. As such, they constitute an eclectic mix of open spaces, natural areas, obsolete infrastructure, geographical restrictions, farming land, and other topographies that in their own way contribute to the city's environmental and functional performance. Despite being identified in the literature, there has been little recognition of interstitial spaces as part of the environmental sustainability of urban systems, and how they support cities in improving their resilience and adaptation capacities. Using the case of Santiago de Chile, this article highlights an environmental approach to studying the interstices

and the need to examine such spaces at different scales linked to their respective environmental potentials.

Moving to Blue-Green Infrastructure, O'Donnell *et al.* (2021) argue that swales, green roofs, and wetlands play an important role in reducing vulnerability to climate change risks such as flooding, heat stress, and water shortages, while enhancing urban environments and quality of life for citizens. Understanding the perceptions that professional stakeholders have of BGI is fundamental in addressing barriers to implementation. A novel application of the Implicit Association Test (IAT) is developed to investigate and compare implicit (unconscious) perceptions of blue-green and grey infrastructure with explicit (conscious) attitudes. This is the first time an IAT about BGI has focused on professional stakeholders. Blue-green and grey infrastructure are perceived positively by the sample population. Overall, respondents implicitly and explicitly prefer BGI, and regard it as safer, tidier, more attractive, useful, valuable, and necessary. The individual positive explicit perceptions of grey infrastructure, nonetheless, suggest that integrated blue-green and grey systems may be preferable for professional stakeholders to incorporate into urban water management and climate change adaptation strategies.

In the penultimate article, Hannah Knox (2021) shows how everyday engagement with digital energy data in the face of climate change is remaking forms of public participation, in ways that are often overlooked in policy discussions about climate change and how to tackle it. This article presents the findings of ethnographic research in the UK with a network of engineers, activists, and citizens involved in developing smart energy monitoring systems and community smart grids. The article explores how everyday uses of data, material evidence, and sensory information on material and thermodynamic processes that appear in such projects, are opening up new spaces for public participation in climate change politics. Here, familiar discursive and deliberative forms of democratic participation are supplemented by what are termed *material diagnostics*—a practice of public-participation that revolves around a collective effort to unpack and rethink infrastructures as sites of climate action. Building on these findings, the article suggests that everyday digitally informed experiments with urban infrastructures have the potential to extend the kinds of political subjectivities and participatory politics that are possible, as governments seek to transition to a net-zero future.

Finally, Vanesa Castan Broto *et al.* (2021) ask what it means to look for reparative innovation for climate change adaptation. Scholars of climate urbanism have raised the conundrum that action to address the ongoing challenges of climate change in cities have distributional impacts, deepening existing inequalities. Climate change adaptation poses risks to the delivery of sustainable but also just resilience transformations. This challenge is related in part to ideas about urban innovation that

dominate climate responses. In particular, disruptive innovations are directed towards the rupture of existing systems of knowledge, seeking to create new ways of looking at the problem. The emerging scholarship on climate urbanism suggests that measures to adapt to climate change in urban environments heeding a disruptive narrative have uneven impacts and too often disadvantage the most vulnerable communities. Reparative thought has influenced different debates on climate change adaptation and other issues related to social justice, from dealing with the aftermath of conflicts to engaging in reparative experiences to deal with trauma. Critical theory has also looked into reparation as a means to engage with reparative understandings of cultural objects and heritage. We argue for a focus on reparative innovation to open up alternative innovation frameworks that acknowledge existing material urban histories and engage with the multiple forms of knowledge that permeate the urban experience.

Together these articles highlight the range of impacts climate change has/will have in urban areas, and being to suggest ways forwards. This issue forms part of the British Academy's COP26 series, which aims to raise awareness of the importance of the humanities and the social sciences in understanding the complex human and social dimensions to environmental challenges and their solutions. The authors are drawn from a range of Academy programmes, including *Mid-Career Fellowships*, *Urban Infrastructures of Wellbeing*, which aims to support interdisciplinary research that explores how formal and informal infrastructures interact to affect the well-being of people in cities across the Global South, the *Sustainable Development Programme*, which funds researchers working on the UN's Sustainable Development Goals, and *Knowledge Frontiers*, which aims to enable different communities of knowledge and practice to illustrate the unique added value of international and interdisciplinary collaboration.

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