Editorial: Connecting decarbonization and social justice in cities

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I. INTRODUCTION

Efforts to link climate action and social justice in cities have tended to focus on adaptation,[1] and the decentralization of resources and decision-making powers to cities and communities.[2] Little attention has been paid to how cities – including cities with low carbon footprints – could accelerate decarbonization and even bypass carbon-intensive trajectories of cities in the global North.[3] And even less attention has been paid to how such decarbonization processes might be accelerated while advancing social justice which, at a minimum, means reducing poverty and responding to unmet basic needs. This special issue of *Environment and Urbanization* expands the empirical research and debates on how climate change mitigation policies and practices can align with the imperative to secure social justice in cities and to support the agendas of urban social movements. Low-income and informal settlements present ample opportunities to accelerate mitigation efforts by reducing and eliminating CO_2 emissions from building and manufacturing processes, and extending the uptake of renewable energy supplies, a process widely known as decarbonization. By advancing our understanding of the scale of spatial and economic informality, and with a critical analysis of how climate action and policy can reduce poverty and inequalities and promote political inclusion, the papers in this issue contribute to debates around urban climate justice and point to opportunities to connect decarbonization

to social justice in low- and middle-income cities. We and the papers in this issue recognize that adaptation is an immediate priority, and often the starting point, for low-income and marginalized communities living on the front line of climate change. Rather than supplanting those priorities, we explore and demonstrate how decarbonization as a process of mitigation is an essential component for efforts to achieve urban climate justice and climate-resilient development.

II. RESEARCH THEMES IN THIS ISSUE

Attention to urban climate justice, which provides a framing for research and action in the global South, has expanded significantly in the past decade, and policy advocates and practitioners have strengthened evidence in this regard based on climate-resilient development. It is also a useful basis for framing the Editorial of this special issue. Links between decarbonization and social justice in cities are emerging, but there is a need for more empirical research and practical knowledge about grounding climate justice in low-income and informal settlements among grassroots organizations, planners and practitioners, policymakers and other governing actors.

Papers in this issue support three relevant lines of research and debate that respond to this gap. The first theme considers why low-income and informal communities are legitimate sites not only for adaptation-oriented climate action but also for mitigation via the process of decarbonization, looking at how low-income communities can play an active role in associated planning processes (see Ali et al. and Moretti

1. Shi et al. (2016); Yang et al. (2021).

2. Colenbrander et al. (2018).

3. Liu et al. (2022).

et al. in this issue). The second theme explores the extent to which low-carbon infrastructural initiatives can align with efforts to address structural and spatial urban inequalities (see Hermanus and Cirolia, Yang, Dias et al., and Muñoz-Chavez et al. in this issue). Finally, reflecting on normative urban climate justice framings, a third set of papers focuses on the unequal opportunities in the current climate policy and action arena for the participation of all urban stakeholders, and notably low-income and informal urban actors and women (see Alber, Herrera, and Roll et al. in this issue). These papers all, in one way or another, connect decarbonization with efforts to achieve social justice in low-income urban communities in the majority world.

a. Why focus on decarbonization in low-income urban settlements?

The impacts of rising temperatures and the consequences of failing to limit global warming to 1.5°C continue to fall most heavily on less developed countries and low-income populations.[4] These effects exacerbate the challenges faced by those living in informal settlements, who have limited adaptive capacity because of severe housing, infrastructural and basic service deficits, and low incomes.[5] Given the inverse relationship between their carbon emissions and their vulnerability, low-income communities with small carbon footprints should not bear the responsibility for decarbonization. However, their voice as urban residents and their need for improved infrastructure must be recognized. In this context, a failure to engage low-income communities in planning for investments and interventions focused on decarbonizing cities is likely to replicate existing socioeconomic and infrastructural inequalities.[6]

The global climate emergency provides an unprecedented challenge to the future of the planet. It is vital to fully consider all possible opportunities to accelerate decarbonization *and* adaptation and at the same time to respond to pervasive poverty and inequality through collective, city-wide and community action, as part of a global development approach that also seeks to redress North–South inequalities and climate reparations.[7] In the process of preparing for this journal issue it has become clear to us that more research is urgently needed on governance and planning processes that integrate decarbonization within climate-resilient upgrading for low-income informal neighbourhoods. Action to reduce and avoid future emissions must be relevant to both existing and new neighbourhoods; and low- or zero-carbon technology should benefit residents of all incomes. It is important to bear in mind that, according to estimates from the International Energy Agency, 80 per cent of urban buildings and infrastructure that will exist in sub-Saharan Africa in 2050 are yet to be built.[8]

The Intergovernmental Panel on Climate Change's (IPCC) sixth assessment stresses the combination of adaptation *and* mitigation actions that climate-resilient development requires, extending beyond current short-term adaptative strategies in cities.[9] For example, nature-based solutions such as green roofs, rain gardens, permeable pavements and green pergolas can enhance resilience to a range of climate hazards including flooding, heat island effects and air pollution, and can be paired with building materials and practices and renewable energy infrastructure that advance decarbonization in the city. However, if these interventions are to be relevant to the Sustainable Development Goals and social justice priorities, they require a focus on equity, ensuring that infrastructural and housing investments benefit significant numbers of low-income and marginalized communities in the city.

Many of the papers in this special issue demonstrate how and why efforts to reduce overall emissions should consider low-income settlements as sites of intervention, and dispel the myth that low-income communities have no role to play in decisions related to climate action and investments. Ali et al. outline how the knowledge and practice of low-income communities in Lagos, Nairobi and Johannesburg engaged in local infrastructural development can challenge global sustainability narratives and, in turn, contribute to a reframing of urban climate justice

4. Sealy-Huggins (2017).

5. Dodman et al. (2019).

6. Sovacool et al. (2019).

7. Gillespie and Mitlin (2023).

8. IEA (2019).

9. IPCC (2023).

predicated on access to resources and broader patterns of participation. This paper contributes to emerging debates around who benefits from infrastructural interventions, specifically those that promote decarbonization. Current sustainability narratives and framings, including that of climate justice, continue to be dominated by wealthy countries, and have legacies of colonialism and unequal development. A failure to reflect on the perspectives of low-income urban communities will further deepen existing inequalities. Climate injustices have tended to be framed at national and global levels. The authors, by contrast, demonstrate the value of considering inter- and intra-urban inequalities and how these inequalities manifest on different fronts: in local infrastructure interventions that can accelerate decarbonization, in the scope for collaboration with local government, and in the integration of community knowledge into policy and practice.

Climate narratives and interventions are often driven by elites and power holders, and consequently can exacerbate inequalities, exclusion and injustice, and can accelerate elite capture of prime land and resources.[10] Moretti et al.'s paper in this issue explores the work of social movements focused on housing occupations in São Paulo and Natal, and considers how this work can advance alternative pathways towards decarbonization. They argue that housing occupations can simultaneously reduce socioeconomic vulnerability and exclusion exacerbated by climate change, and present housing alternatives in vacant unused housing in the centre of cities (a practice also explored in a different context in the paper by Ali et al. in this issue), which thereby limits the need for transport to work and for new construction. Low-income communities are often excluded from central districts. Meanwhile there are significant numbers of empty buildings in the centre of the city (11.78 per cent of São Paulo's homes and 15.44 per cent of Natal's homes). The work of social movements in this instance highlights how vacant buildings in the centre of cities could provide an immediate alternative form of housing with a relatively low carbon footprint. This provides an entry point for strategic engagement with local government on more equitable and sustainable access to housing for marginalized communities in the city.

Using data collected by WIEGO,[11] Dias et al. (in this issue) contend that research on waste pickers' engagement with climate action, including emissions reduction, should be grounded in the knowledge and practice of waste pickers. Research on their specific needs – including the discrimination and poverty that they experience – reveals that waste pickers have a nuanced understanding of the local impacts of climate change and the implications for resilience and social justice. The authors contend that effective climate action in cities that prioritizes climate justice requires better coordination between all levels of the state, and collaboration with organized waste pickers. To secure benefits for climate mitigation, waste pickers need access to appropriate technology and financial support. For this reason, the authors argue for financial incentives for waste pickers, such as a recycling or climate bonus, to reflect the public and climate benefits of their work.

Muñoz-Chavez et al. also examine household practices of waste management in informal neighbourhoods in Santiago de Cali, Colombia and the implications for 'zero waste' municipal strategies. Noting the unequal access to waste collection services, the authors describe the many sustainable practices of low-income households regarding waste separation and reuse of organic matter. Some of these sustainable habits are rooted in traditional knowledge and practices that internally displaced women from more rural settings have maintained. The mixed quantitative and qualitative methodological approach of Muñoz-Chavez and colleagues is a valuable contribution in framing household and neighbourhood-level waste management practices as climate action and identifying opportunities for scaling up such practices for measurable contributions to greenhouse gas (GHG) reduction.

b. How infrastructural initiatives can align with efforts to promote social justice

A growing body of research examines how low-carbon and climate-resilient infrastructure and

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10. See Sovacool et al. (2019).

11. Women in Informal Employment: Globalizing and Organizing (WIEGO) is a global network focused on empowering the working poor, especially women, in the informal economy to secure their livelihoods.

housing strategies can reproduce inequalities and foment "green gentrification".[12] Most empirical research on this front focuses on cities in the global North,[13] with some emerging from Southern cities.[14] Sovacool et al.[15] argue that low-carbon pathways – a framework of economic development meant to avert GHG emissions as low- and middle-income economies grow – are easily captured by *elite processes* and ideologies via experimental climate policies and low-emissions technologies, and by increased financialization via debt-based climate funding, as discussed by Herrera (in this issue). The result is often the displacement of low-income and climate-vulnerable populations from contested land and dispossession of their homes and property. The role of local government in these processes is not straightforward. In some cities, municipal governments and wealthy residents that are hostile to low-income, self-built settlements have long used environmental concerns and disaster "risk" as grounds to demolish informal settlements and displace their inhabitants.[16] Yang and Herrera (both in this issue) each provide examples of how local governments can disingenuously adopt green rhetoric in the form of waste management policies and municipal green bonds to advance alternative agendas that have negative implications for climate and for equity.

More research is needed in Southern cities that are pursuing more progressive projects so as to understand the potential for climate-just approaches to infrastructure for low-income communities – approaches that are sorely needed by those living in informal settlements.

Aligned with calls for more climate-resilient development[17] and for climate finance to recognize the imperative of integrated climate action,[18] there is a small but expanding evidence base on scalable climate-resilient infrastructure and housing interventions in informal settlements[19] that is led or co-led by

local government institutions. For example, nature-based solutions are being used as an entry point to shift mindsets about informal settlement upgrading intervention in Buenos Aires in a process that is being co-led by the City Housing Institute.[20] Climate-resilient development can be central to participatory upgrading with systematic cross-sectoral action spanning housing, transport, waste and energy concerns, a potential currently being explored in the Mukuru special planning area process which includes Nairobi City County and the Muungano Alliance.[21]

Several papers in this special issue consider the extent to which infrastructure investments, and specifically energy transitions towards renewables, can also respond to local development needs and reduce structural spatial inequalities. Two papers in particular (Hermanus and Cirolia; Yang) provide empirical reflections on how green infrastructural investments can fall short of the mark when they are poorly aligned with local governance structures or are used as a means of suppressing environmental protest and state resistance. Hermanus and Cirolia's paper considers the implications of efforts to improve access to decentralized urban renewable energy projects in Uganda. Undeterred by the decentralization and distribution of technologies, renewable energy governance is found to be fragmented and contested. It is dominated by international donors, agencies and private actors and there is little room for local government to effectively govern the transition or delivery of services. The authors conclude that current efforts to promote just transitions are not effective because they do not support and empower local urban governments and institutions to ground and localize energy governance.

Yang's paper in this issue considers how Guangzhou transitioned from landfill to incineration infrastructure as part of the rescaling of national Chinese environmental governance through the "low-carbon cities" initiative. The author contends that the decentralization of environmental policy was in fact an effort to respond to local state resistance and environmental activism, given widespread public resistance to incineration as a form of

12. Anguelovski et al. (2019); Blok (2020); Bouzarovski et al. (2018); Harper (2020).

13. Anguelovski et al. (2022); Cucca et al. (2023).

14. Yazar et al. (2020); Torres et al. (2022).

15. Sovacool et al. (2019).

16. Ghertner (2011); Doshi (2018); Zeiderman (2016).

17. IPCC (2023).

18. OECD (2021).

19. Núñez et al. (2020).

20. Hardoy et al. (2022).

21. Sverdlik et al. (2019).

waste management in the city. Yang sets out how incineration as a modality of energy transition does little in terms of decarbonization; instead, it was a means of responding to a growing waste management challenge resulting from rapid urbanization. The author argues that Guangzhou City government developed a series of performative governance practices around incineration that implied good governance in the context of climate change and aimed to legitimize the state in the face of ongoing social protest. He concludes that alternative forms of environmental governance linked to changes in political capacities and emerging technologies could provide relevant topics for future research.

There are emerging examples of decarbonizing infrastructural initiatives that can improve inclusive governance and respond to basic needs. The Energy Justice Program, developed by Slum/Shack Dwellers international (SDI), promotes decentralized solar energy as a means of providing pro-poor disaggregated energy to informal urban communities across 12 sub-Saharan countries. The entry point is energy and more equitable access, but the means is predominantly based on low-carbon energy systems. Communities have played an active role in the transition process, accelerating the adoption of new technologies, and alternatives to grid-based electricity.[22] In addition, the Society for the Promotion of Area Resource Centers (SPARC), SDI and the Global Resilience Partnership, in collaboration with the UN Climate Change High-Level Champions, have together recently launched a campaign that aims to deliver resilient, affordable, low-carbon homes for 2 billion people by 2050. At the core of this campaign is an effort to align social justice with resilience and decarbonization for marginalized urban communities.[23]

c. Urban climate justice: enhancing equity in participation

As previously outlined, this special issue draws on framings of urban climate justice in order to connect decarbonization and social justice in cities. Analysis of global, national and local climate policy debates using a normative justice lens[24] has emerged alongside literature focused on urban planning and design for equity in the context of climate change[25] to lay the foundations for urban climate justice framings. Building on this, critical urban theory has been used to analyse neoliberal climate urbanism in order to understand and critique how climate strategies and action are presented as apolitical and technocratic yet are fundamentally shaped by free market ideology and reproduce uneven and unjust urbanization.[26]

Climate justice debates across spatial scales often begin by acknowledging an injustice – the unequal and unfair distribution of harm caused by climate change. As previously stated, the urban poor are more likely to experience the negative consequences of global warming and are less capable of bouncing back.[27] Further research underscores how race, gender, sexuality, migration status, age and (dis)ability intersect with poverty and make minority and oppressed identity groups disproportionately vulnerable to climate change.[28] It follows that research has prioritized the understanding of and adaptation to the climate risks faced and the harms experienced by those living in poverty. This issue seeks to understand how decarbonization technology and practices can be integrated into climate action in low-income and informal neighbourhoods in such a way that responds to poverty and promotes political inclusion.

Some papers in this issue build on existing calls for expanded research on the practical application of urban climate justice beyond conceptual analysis, critical theory or frameworks and principles.[29] Cohen[30] argues that the new social movements that have coalesced around "the right to the city" provide the best opportunity of achieving wide social appeal

22. Sheridan et al. (2019).

23. Owen-Burge (2022).

24. Bulkeley et al. (2013); Castán Broto and Bulkeley (2013); Granberg and Glover (2021).

25. Steele et al. (2012); Shi et al. (2016); Fuentealba et al. (2020); Rice et al. (2020).

26. Long and Rice (2020); Castán Broto and Robin (2021); Ranganathan and Bratman (2021).

27. UN Human Settlements Programme (2011); Dodman and Satterthwaite (2008); Hardoy and Pandiella (2009); Douglas et al. (2008).

28. Ranganathan and Bratman (2021); Schell et al. (2020); Khosla and Masaud (2010); Kilpatrick et al. (2023).

29. Hughes and Hoffmann (2020); Rice et al. (2023); Castán Broto et al. (2023).

30. Cohen (2018).

for long-term urban sustainability. Similarly, Wagle and Philip, writing in this journal, argue that climate adaptation strategies in Mumbai threaten to reproduce inequalities unless they centre "voices from below". These authors call on *"climate-oriented planners [to] learn from the rich history of the struggles of Mumbai's informally housed, religiously diverse, creative but embattled working populations"*.[31]

While the field of climate action in cities has expanded significantly both in policy and practice and in academic study, notions of justice and equity are often sidelined as too political or too social. Sirigotis et al.[32] argue that most municipalities fail to effectively integrate equity and justice into climate action planning. While climate planning (mostly in the North) shows a correlation between increased climate ambitions and a greater concern with inclusion and justice, equity is rarely a priority for cities committed to net zero emissions.[33] Relatedly, municipal actors struggle to integrate gender equality into their climate policies and plans, as noted by Alber (in this issue). In a Field Note the author reports on a translational project that developed and piloted the first gender-responsive climate mitigation and adaptation policy tool for city governments in the global South. The assessment tool (GAMMA) supports gender inclusion and calls attention to climate action that reproduces inequalities, such as subsidies to male-dominated professions while ignoring feminized labour and caregiving. However, a key learning is that municipal governments and local women-led civil society organizations rarely have climate policy experts who also have gender expertise and vice versa. Even with accessible and context-relevant policy tools like GAMMA, Alber underscores the importance of multistakeholder collaboration. Barriers to participating in climate decision-making and silos between climate action advocates and established urban social movements might indirectly de-prioritize equity and justice in municipal climate planning and action. Urban social movements and federations of the urban poor have not been included as equal partners in climate agendas and global policy arenas,

which have historically been shaped by national actors, global and national data sets and policy debates.

Several papers in this special issue focus on the inequalities of opportunity in the current climate policy and action arenas that are dominated by mitigation and low-carbon development strategies. There have been high aspirations surrounding municipal green bonds (MGBs) as a means of providing resources to cities – particularly in the majority world – to tackle climate change, but very limited examples of their implementation. Herrera (in this issue) analyses the implementation and impact of MGBs in San Francisco, Mexico City and Cape Town using the established framework of procedural, recognition and distribution justice, and sets out how subnational "green" debt can produce climate injustices. The author contends that the green-labelled funding in these cases did little to advance climate justice and instead was used by local government to fund ongoing infrastructural priorities. Climate and social injustices continued and were even exacerbated in each city. The author calls for more transparency at local government level about the extent to which MGBs can simultaneously respond to climate change and inequality; furthermore, additional research on this issue could inform broader efforts to integrate climate justice into debates around the role of climate finance in cities.

Roll et al.'s paper considers urban labs as an alternative governance arrangement that could provide innovative solutions to non-linear urban challenges such as climate change. Urban labs present a collaborative space for a range of public, private and civil society actors to co-produce and test scalable interventions. The authors focus on the formation of urban labs in five cities in Argentina, Brazil and Mexico premised on establishing transformative urban coalitions that aim to accelerate net zero pathways while promoting social justice. In Buenos Aires, for example, the urban lab focused on developing decarbonizing interventions as part of an existing informal settlement upgrading scheme. The lab included participation from the local community and the city's Housing Institute alongside others. The paper examines the lab formation process rather than the practical and strategic impact of urban

31. Wagle and Philip (2022), page 333.

32. Sirigotis et al. (2022).

33. Della Valle et al. (2023).

labs. In doing so it demonstrates the importance of developing broad goals that extend beyond technocratic interventions to include social and economic priorities. Meaningful inclusion of local communities and paying close attention to urban governance arrangements are central to this process. Secondly, reflecting on the formation of Latin American urban labs compared to European urban labs, the authors underscore the importance of understanding and sustained engagement with local context as opposed to global and regional differences.

The discussion in this issue of *Environment and Urbanization* builds on earlier contributions to this journal, grounding climate (in)justice in various empirical contexts of urban poverty and informality. Previous issues of the journal have documented the disproportionate climate-linked harm experienced by those living in urban poverty.[34] More recently, authors began explicitly engaging with the issue of climate justice. Chu and Michael in 2019[35] examined the exclusion of migrants in Indian cities and argued for a greater emphasis on the "recognition" dimension of urban climate justice. Participation in climate decision-making spaces has been discussed as a key factor of just outcomes, for example in transnational municipal networks[36] and in participatory budgeting.[37] Most examples of this kind of engagement have focused on risk, adaptation and resilience, aligning with the emphasis on adaptation within global and urban climate justice discourse and, more recently, addressing loss and damage. This special issue builds on and complements these debates with the aim of exploring how mitigation via decarbonization can align with social justice agendas in cities.[38]

III. FEEDBACK

We have only one Feedback paper in this issue, the account by Pryor Placino and Napong Tao Rugkhapan on the role of concrete in the modernization of Asian cities. The paper touches closely on this special issue's concern with both decarbonization and justice. Concrete, the authors point out, is the most heavily consumed substance in the world after water, and its production is among the very top carbon emitters. Its widespread use has led to a host of ecological issues, from the imperviousness and heat retention of urban surfaces to the environmental degradation that accompanies the extraction of its raw materials. The damage is not only environmental. The authors argue that the benefits of concrete have also been accompanied by a less well-documented hardening of social inequalities and injustices. The authors focus specifically on Metro Manila, tracing the history of concrete use in transforming its built environment, and going on to consider the current implications and socioecological *"entanglements"* of its production. They build on Val Plumwood's concept of *"shadow places"*[39] to explore the hidden underbelly of the concrete economy – the unregulated mining quarries where marginalized workers eke out a meagre living, and the communities suffering from cement dust pollution and inhalation – documenting not only the hardships but also the creative resistance of those penalized by the industry. Through recognizing and making visible these shadow places and actions, the authors see the possibility of moving towards the *"environmental justice principle of place"* advocated by Plumwood.[40]

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34. E.g. Huq et al. (2007); Satterthwaite (2011); Satterthwaite and Bartlett (2017).

35. Chu and Michael (2019).

36. Geldin (2019).

37. Cabannes (2021).

38. Cociña et al. (2022); Levy et al. (2023).

39. Plumwood (2008).

40. Plumwood (2008), page 147.

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