

ADVANCED REVIEW

Ten years after Copenhagen: Reimagining climate change governance in urban areas

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Editor-in-Chief****Abstract**

In this review, we take stock of the last decade of research on climate change governance in urban areas since the 2009 conference in Copenhagen. Using a systematic evaluation of academic publications in the field, we argue that the current moment of research has been shaped by two recent waves of thought. The first, a wave of *urban optimism*, which started in 2011 and peaked in 2013, engaged with urban areas as alternative sites for governance in the face of the crumbling international climate regime. The second, a wave of *urban pragmatism*, which started in 2016, has sought to reimagine urban areas following the integration of the “sub-national” as a meaningful category in the international climate regime after the 2015 Paris Agreement for Climate Action. Four themes dominate the debate on climate change governance in urban areas: why there is climate action, how climate action is delivered, how it is articulated in relation to internationally reaching networks, and what implications it has to understand environmental or climate justice within urban settings. Calls to understand the impacts of climate change policy have fostered research on climate change politics, issues of power and control, conflicts, and the inherently unjust nature of much climate policy. What is largely missing from the current scholarship is a sober assessment of the mundane aspects of climate change governance on the ground and a concern with what kind of cultural and socio-economic change is taking place, beyond comparative analyses of the effectiveness of climate policies.

This article is categorized under:

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1 | INTRODUCTION

“Time of promises and good intentions has passed. Actions are needed now,” stated Katrín Jakobsdóttir, Prime Minister of Iceland, in her address at the opening of the Arctic Circle on October 19, 2018. She then proceeded to describe the massive changes taking place in the Arctic—the summer ice cap could be lost within a generation—and how they will impact on indigenous peoples, ecosystems and on the region's function as a global thermal regulator. Katrín Jakobsdóttir was speaking of the need for hope in the wake of the IPCC Report on Global Warming of 1.5°C (Intergovernmental Panel on Climate Change, 2018). A decade ago, as the international climate regime seemed to crumble in Copenhagen, some found hope in the actions in urban areas around the world (Hoffmann, 2011). However, such hope did not always seem to translate into action, as recognized in the report of the Working Group 3 of the Fifth Assessment Report of the IPCC:

Thousands of cities are undertaking climate action plans, but their aggregate impact on urban emissions is uncertain (robust evidence, high agreement) ... there has been little systematic assessment regarding the overall extent to which cities are implementing mitigation policies and emission reduction targets are being achieved, or emissions reduced (Edenhofer et al., 2014, p. 928).

At the time, Bulkeley (2010) argued that the dominant focus on how to govern climate change obscured the actual workings of governance in practice, as analyses attempted to grasp the insights of a myriad of case studies (Ahammad, 2011; Bulkeley & Betsill, 2005; Bulkeley & Kern, 2006; Dodman, Mitlin, & Co, 2010; Francesch-Huidobro, 2012; Ng, 2012; Roberts, 2008, 2010). A focus on climate change policies (what should be done) and the political drivers of climate action (why something should be done), turned attention away from the everyday realities of climate action. At the same time, calls for aggregated analyses of the impacts of climate action have fostered regional or global assessments that tend to miss the detail of actions on the ground (Dolsak & Prakash, 2017; Homsy & Warner, 2015; Hultquist, Wood, & Romsdahl, 2017; Pablo-Romero, Sánchez-Braza, & Manuel González-Limón, 2015; Romsdahl, Wood, & Hultquist, 2015; Sharp, Daley, & Lynch, 2010; Shi, Chu, & Debats, 2015; Simon Rosenthal, Rosenthal, Moore, & Smith, 2015; Zahran, Grover, Brody, & Vedlitz, 2008).

The purpose of this review is to take stock of the current literature on climate change governance in urban areas. Through a systematic review of the field, we have identified two waves in which the publication of articles on the governance of climate change in urban areas has accelerated. The first wave of *urban optimism*, which dominated the debate between 2011 and 2013, included research that represented urban areas as alternative sites for governance in the face of national disinterest and a collapsing international climate regime. The second wave of *urban pragmatism*, which took shape around 2016 and is still growing, engages with the need to reimagine urban governance to integrate the “sub-national” as a meaningful category within the framework of the 2015 Paris Agreement for Climate Action. The analysis of critical narratives emerging from the last decade of research in cities and climate change demonstrates the close relationship between international policy discourses and climate change scholarship.

We identify five key themes in these two waves. First, the research has explored motivations for action asking why local governments and other responsible institutions in cities act on climate change. Second, scholars have been concerned with how to deliver such action. Third, as calls for coordination gave the research theme an international orientation, interest grew on how to govern the city within the international climate regime. Fourth, alongside these themes, there has been a consistent concern with the question of climate justice and how climate action addresses or fosters further urban discrimination and inequality. The increasing interest in justice-related themes has fostered interest in examining the inseparable nature of climate change and politics, issues of power and control, conflicts, and the inherently unjust nature of much climate policy. Fifth, while there is some research on the delivery of policy in practice, there remains a gap in terms of having a consistent and comparative body of research that addresses the everyday realities of climate action.

2 | TWO WAVES OF RESEARCH ON URBAN CLIMATE GOVERNANCE

We conducted a systematic literature review of 383 articles that present social sciences analyses of climate change action in urban areas.¹ The sample suggests that there has been an explosion in the number of published articles, with two moments of acceleration, the first one from 2011–2013, and the second one from 2016 onwards (Figure 1).

We used two analytical strategies to examine this set of articles. First, we read those moments of acceleration as responses to radical changes in the international climate regime, to characterize them as “waves” in the literature on climate governance. The objective was to relate developments in the academic field with policy debates on climate change.

FIGURE 1 Evolution of the number of publications related to cities and climate change

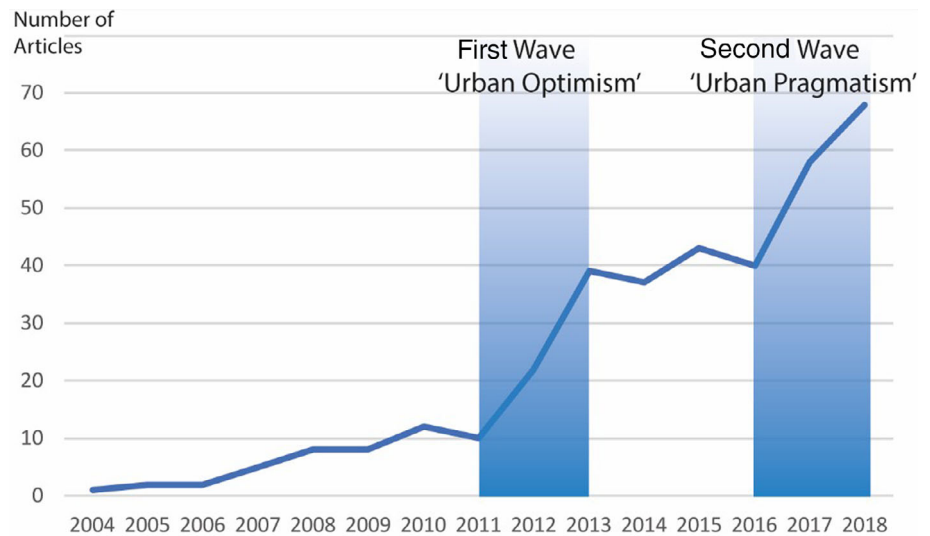


TABLE 1 Key debates within the two waves of research

	Urban optimism	Urban pragmatism
Why act on climate change?	Exploratory analyses of incentives to act in urban areas	Quantitative analyses to test the emerging hypothesis and identify drivers across contexts
How to act on climate change?	Generation of case studies about what works	Consolidation of a mixed body of qualitative and quantitative evidence and instrumentalization of key approaches (<i>this is currently the dominant perspective in the literature</i>)
Governing the city within the international climate regime	Celebration of city networks as a demonstration of the growing importance of cities in the climate regime	Deeper examination of how networked governance strategies fail in practice Shift back to examine the role of the central actors of the climate regime, for example, through the dynamics of orchestration
Environmental injustices	Critical scholars never fully embraced urban optimism, keeping a skeptical perspective on any celebration of the role of cities	In-depth analyses of urban processes under climate change with a focus on the emergence of climate urbanism and its consequences, such as climate apartheid and gentrification
Everyday realities of climate action	Calls to consider everyday life alongside urban materialities was present in early studies (Aylett, 2013; Bulkeley, 2010; Rutland & Aylett, 2008)	Everyday experiences of the urban fabric, intersectionality and its consequences, household-based approaches are long marginalized topics that never entirely took off

Second, we sought to reveal the thematic changes occurring across the two waves. Taking as reference a previous review of the field by one of the authors (Castán Broto, 2017), we coded each paper to reflect different areas of interest including the presence of keywords (mitigation, adaptation, resilience, smart cities, etc.), the kind of actions presented (community-based adaptation, planning, green infrastructure, etc.), and the methodologies used in the paper (qualitative, quantitative, mixed methods, other). The coding was iterative. Rather than fixing the coding categories on the first round we refined them over three interactions until a map of five dominant themes emerged. Those five themes, summarized in Table 1, have structured the analysis in the rest of the paper. After both analyses were completed, we conducted a further review of the papers to examine the variation on the themes between the two waves (see also Table 1).

These two periods of acceleration correspond to two waves in the literature of climate change governance: the first wave of *urban optimism* and the second wave of *urban pragmatism*. The first wave coincides with the rise of “urban optimism” in global sustainable development agendas (Barnett & Parnell, 2016) that led to the publication of major policy reports that sought to mobilize cities and urban areas in international events and high policy forums (Atkins, 2013; Hoornweg, Freire, Lee, Bhada-Tata, & Yuen, 2011; UN-Habitat, 2011). This wave followed changes in mainstream thought about climate action. Until the mid-2000s, debates on climate change and cities focused on the reduction of

carbon emissions. Around 2006, interest in climate change adaptation led to an increase in climate change adaptation studies that explicitly incorporated considerations of justice, equity, informality, poverty, and gender as embedded in risk, vulnerability, and resilience agendas (Dodman & Satterthwaite, 2008; Kovats & Akhtar, 2008; Satterthwaite, 2007). These pioneering adaptation scholars, who mostly conducted their research in rapidly growing urban areas in the Global South, were concerned with the structural drivers of vulnerability as a means to develop their theoretical inquiry (defining vulnerability and resilience), and frameworks for urgently needed action. Scholars focused on mitigation tended to study large cities in the North with significant carbon footprints, focused on assessments of policy instruments, effective management, and drivers of action (Betsill & Bulkeley, 2006; Bulkeley & Kern, 2006). A concern was that growing interest in mitigation deviated attention from adaptation or vice versa (Davoudi, Crawford, & Mehmood, 2009). During the first wave of *urban optimism* these two approaches came together. Our analysis shows that rather than turn attention away from each other, the cross-fertilization of work across the adaptation and mitigation divide led to a diversification of research topics and the expansion of the authorship-base. Cross-cutting topics, such as urban informality, nature-based approaches, and community-based, collaborative, and participatory approaches supported the accelerated growth of scholarship, leading to calls for more research on practical outcomes. This process led to the emergence of new concerns that eventually consolidated into a second wave of *urban pragmatism*.

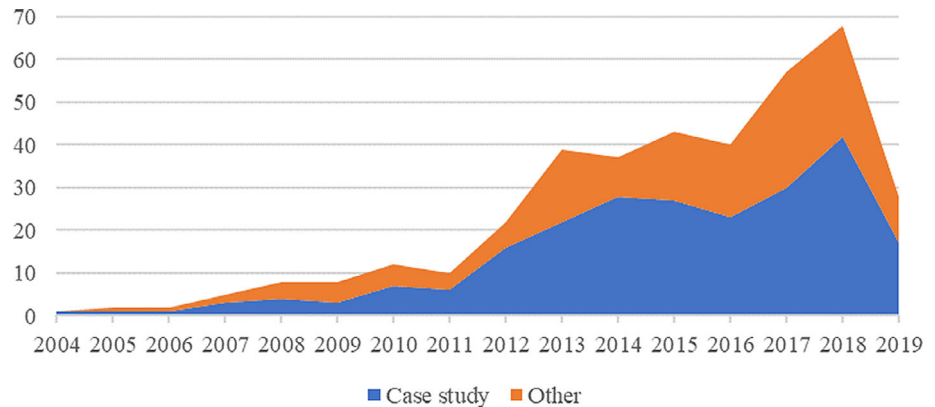
In the years that preceded the 2015 Paris Agreement, scholars often presented the research based on cities as an alternative to the international climate regime. The Paris Agreement helped to formalize the integration of sub-national actors in the current global framework for climate action. The second wave emerged when the topic of cities and climate change engaged a broader group of interdisciplinary scholars beyond the original disciplines that originated the field (urban studies and planning, development studies and human geography, and political science) that sought to respond to the demands of national and international policymakers in practical, more pragmatic ways.

For example, the 383 papers reviewed were published in 76 different journals, but the majority (63%) appeared in only 11 journals. The first wave was dominated by interventions in journals such as *Urban Studies* and *Environment and Urbanization* (which published 32 and 49 papers, respectively), in dialogue with other journals in critical urban studies (e.g., *International Journal of Urban and Regional Research*) and development studies (e.g., *Habitat International*). This work most often adopted a critical angle and emphasized cross-cutting themes, such as urban informality and vulnerability. Following the second wave we have seen a shift towards journals with a focus on providing workable alternatives beyond the critique, such as *Cities* and the *Journal of Environmental Policy and Planning*, while at the same time, the variety of outlets for cities and climate change work has diversified into fields as varied as environmental economics, spatial planning, and environmental law.

Two other observations provide a context to understand the nature of the field and why it has evolved in this particular way. First, the field of research on climate change governance in urban areas is sensitive and responsive to policy debates. International political crises and agreements have supported the development of the field. Scholars have remained wedded to terminology developed in policy discussions, despite ongoing criticisms from some sectors within academia. For example, the language of “adaptation” and “mitigation,” which structures the delivery of the IPCC reports, remains consistently used in the papers reviewed. Despite their visibility, alternative conceptualizations of urban action (low carbon, resilient, smart) have been confined to disciplinary debates and appear much less frequently than the more generally accepted concepts of adaptation and mitigation.

Second, the central preoccupation of this research community is linking theoretical analyses to action on the ground, from allocating responsibilities to developing evaluation means. For example, while both waves are characterized by a combination of a variety of methods, from case studies to quantitative and comparative analyses (Figure 2), they differ in their research objectives. In the first wave, quantitative analyses supported the development of frameworks to quantify and measure indicators relevant in adaptation research. This quantification focused, for example, on mapping vulnerabilities alongside climate risk (De Sherbinin, Schiller, & Pulsipher, 2007; Douglas et al., 2008; Hardoy & Pandiella, 2009; McGranahan, Balk, & Anderson, 2007; Muller, 2007; Revi, 2008; Romero Lankao, 2010; Romero-Lankao et al., 2014), grounding indicator systems for assessing adaptation options (Chandra & Gaganis, 2016; Chang & Huang, 2015; Chelleri, Waters, Olazabal, & Minucci, 2015; Haque, Grafakos, & Huijsman, 2012; Jabareen, 2013; Malakar & Mishra, 2017; Restemeyer, Woltjer, & van den Brink, 2015; Tyler & Moench, 2012) and supporting adaptation planning (Albers & Deppisch, 2013; Johnson & Blackburn, 2014; Lu & Stead, 2013; Spaans & Waterhout, 2017). In contrast, in the second wave, quantitative analysis has been developed following a growing interest in comparison of actions across regions and cities, which goes beyond the traditional focus of the discipline in case study research (but see a contrasting analysis in van der Heijden, 2019). The shift between the two waves represents a move from exploring the “hows” and “whys” of climate action to engage with the “so what” aspects that interrogate both the

FIGURE 2 Dominant methods in the study of cities and climate change (note: “other” refers to a variety of methods ranging from quantitative analysis to comparative research, but not case study)



efficacy and impact of climate action in urban areas. From a perspective of science as a theory-testing enterprise, this shift appears as a sign of maturation of the field, as it gradually moves from theory building to theory testing and attempts to establish a shared basis for actionable ideas. However, we see this change as the product of the coevolution between scientific analyses and policy discourses, in the context of a policy-responsive field of research.

Our preoccupation is that some of the most complex questions about the governance of climate change in urban areas, particularly those related to bridging the divide between policy prescriptions and everyday experience, have been progressively abandoned.

Table 1 provides an overview of the five dominant themes in the literature and how they have been expressed in each of the two waves of *urban optimism* and *urban pragmatism*. Each of these themes is explored in-depth in the remaining five sections of the paper, mapping the different contributions of the papers reviewed.

3 | KEY DEBATES IN THE LITERATURE

3.1 | Why act on climate change—Fostering urban climate change action

Research on the incentives to act on climate change shifted between the two waves of research on climate change governance in urban areas. During the first wave of *urban optimism*, the primary focus of most of the research was to understand why city mayors, local leaders, and officials were voluntarily choosing to pick up the responsibility for climate mitigation and adaptation within their domain of operation. This body of academic work explored political motivations for climate action at the city level, often with reference to opportunities for co-benefits (Heinrichs, Krellenberg, & Fragkias, 2013; Koehn, 2008), bundled development possibilities (Aggarwal, 2013), the presence of political leadership (champions, policy entrepreneurs) (Bassett & Shandas, 2010; Carmin, Anguelovski, & Roberts, 2012; Lassa & Nugraha, 2015; Pasquini, Ziervogel, Cowling, & Shearing, 2015), and the potential for broader political buy-in (Pasquini & Shearing, 2014).

In contrast, the wave of *urban pragmatism* has been marked by an interest in the quantitative evaluation of drivers for action for climate change governance, including large n-studies, such as Reckien, Flacke, Olazabal, and Heidrich (2015). This body of research includes complex modeling exercises that attempt to explain why cities adopt climate to mitigation or adaptation plans or policies, or why they join climate networks (Cruz, 2018; Dolsak & Prakash, 2017; Homsy & Warner, 2015; Hughes, Runfola, & Cormier, 2018; Hultquist et al., 2017; Kalafatis, 2018a, 2018b; Krause, 2011; Lee, 2012; Lee & Koski, 2012; Pablo-Romero et al., 2015; Romsdahl et al., 2015; Sharp et al., 2010; Shi et al., 2015; Simon Rosenthal et al., 2015; Wang, 2012; Wood, Hultquist, & Romsdahl, 2014; Zahran et al., 2008) (or why they abandon them, Krause, Yi, & Feiock, 2016). The field assumes that mitigation and adaptation outcomes depend on a combination of exogenous and endogenous variables, including economic factors, city demographics, political leadership, institutional structures, issue proximity, presence of civil society and environmental activism, and severity of environmental deterioration and risk. Impediments to the adoption and implementation of climate agendas feature prominently within this research agenda. For example, multiple studies explore the disconnection of cities from global debates, the lack of financial capital, limited knowledge, and conflicting priorities, such as the perceived incompatibility of climate objectives with economic progress (Faling, Tempelhoff, & van Niekerk, 2012; Kalafatis, 2018b; Lo, 2014; Picketts, Déry, & Curry, 2014; Sharma & Tomar, 2010).

3.2 | How to act on climate change—Governing effectively, inclusively, equitably

The second area of research revolves around ideas of “good governance” and normative models of climate action (Castán Broto, 2017). The broad consensus developed around the 2030 United Nations Sustainable Development Agenda and the Sustainable Development Goals has contributed to the deliberate adoption of normative values—resilience, inclusiveness, equity—that inform scholarship on climate change governance in urban areas. This line of research currently dominates the literature on urban climate governance—more than half of the journal papers reviewed in this study (201 articles) focused on delivering a normative ideal of good governance.

Within this area of research, a division between different themes of research in the first and the second waves of research cannot be neatly drawn. To some extent, research conducted during the wave of *urban optimism* prioritized the identification of parameters to explain successful urban climate governance, which resulted in recommendations for collaboration (Pitt & Bassett, 2013), integration across sectors (Kithiia & Dowling, 2010; Puppim de Oliveira, 2009; Yung & Chan, 2012), cooperation across levels of government (Jones, 2012; Leck & Simon, 2013) and the establishment of long-term goals and regulative frameworks (Wheeler, 2008). During the wave of *urban pragmatism*, these ideas have consolidated into consensus regarding the need for urban climate governance to be participatory, attuned to bottom-up dynamics, strengthened in terms of monitoring and extended time-frames, holistic, and integrated across sectors, scales, administrative boundaries and realms of knowledge (Barton, 2013; Chu, Schenk, & Patterson, 2018; Dulal & Akbar, 2013; Echebarria, Barrutia, Eletxigerra, Hartmann, & Apaolaza, 2018; Gouldson et al., 2016; Hardoy, Hernández, Pacheco, & Sierra, 2014; Hardoy & Velásquez Barrero, 2014; Nguyen, Davidson, & Gleeson, 2018; Rosendo, Celliers, & Mechisso, 2018; Serrao-Neumann, Renouf, Kenway, & Low Choy, 2017; Swart et al., 2014; Torabi, Dedekorkut-Howes, & Howes, 2017; Tu, 2018; Yasmin, Farrelly, & Rogers, 2018). Interest has grown on identifying effective mechanisms for policy management, such as, for example, delivering flexible policies (Danieri, Drummond, NaRanong, & Tran, 2016; Radhakrishnan, Pathirana, Ashley, Gersonius, & Zevenbergen, 2018; Torabi, Dedekorkut-Howes, & Howes, 2018) and mainstreaming climate concerns into other policy sectors (Di Giulio, Bedran-Martins, Vasconcellos, Ribeiro, & Lemos, 2018; Koch, 2018; Sharma & Singh, 2016) (although an argument for the need to deliver policies with narrow scope has been made recently, Lyles, Berke, & Overstreet, 2018). The consolidation around these terms goes hand in hand with the entrenchment of a discourse of efficiency and integration, which ran through the two waves and that, to some extent, leads to the instrumentalization of these indicators for good governance.

The new wave of *urban pragmatism* has also involved an intensification of attempts to evaluate policy instruments available for mitigation and adaptation, including control-and-demand approaches (Guan & Delman, 2017; Lee & Kim, 2018; Li, 2013; Li & Song, 2016), regulation (Castello, 2011; Kocabas, 2013; Leibowicz, 2017), plans (Millard-Ball, 2012), economic instruments and voluntary programs for innovation (Huang-Lachmann & Lovett, 2016; Iwata & Managi, 2016), or new participatory tools, such as collaborative visioning (Bailey et al., 2012) and social media-based methods (Napawan, Simpson, & Snyder, 2017). We also find attempts to measure and quantify the impacts of plans, discrete policy tools or political leadership, most often in terms of emission reductions (Krause, 2012; Lee & Koski, 2012; Leibowicz, 2017; Millard-Ball, 2012; Park & Page, 2017; Simon Rosenthal et al., 2015; Wang, 2012). Attention, however, tends to concentrate on specific policies evaluated on their own, and analyses of policy interaction across different spheres of action are rare. Assessments of effectiveness in adaptation are also beginning to emerge (Olazabal, de Gopegui, Tompkins, Venner, & Smith, 2019).

Three themes of research have consolidated during the second wave: urban informality, nature-based solutions, and experimentation as a climate change governance approach. The emphasis on urban informality is most often associated with research on community-based action in the Global South, highlighting the inextricable links between climate-related risk, poverty, and marginalization. Empirical work demonstrates opportunities to work alongside communities most affected by climate disaster and collaboratively build their adaptive capacity, especially in the absence of government action (Ahhammad, 2011; Kumar, 2013). Actions directed towards addressing contexts of urban informality need to combine climate adaptation action with poverty-alleviation agendas (Brown & McGranahan, 2016), addressing livelihoods (Simatele, Binns, & Simatele, 2012), tenure (Roy, Hulme, & Jahan, 2013), local infrastructure (Kiunsi, 2013), sanitation (Heath, Parker, & Weatherhead, 2012), and mobility (Milan & Creutzig, 2017). This work is closely linked to studies that use participatory and coproduction approaches to deliver shared learning and communicating local needs (Archer et al., 2014; McEvoy et al., 2014), in actions that address marginalization (Dobson, Nyamweru, & Dodman, 2015; Roy et al., 2013; Stein & Moser, 2014), build recognition of local knowledge and skills (Haque, Dodman, & Hossain, 2014; Odemerho, 2014; Wamsler & Brink, 2014), and tackle technocratic impulses (Castán Broto, 2014). Some research gaps relate to the need to understand the unintended impacts of climate action on the ground, and the need to

increase attention to social groups excluded from urban governance, such as migrants (Adri & Simon, 2018; Martin et al., 2017; Santha et al., 2016).

The emphasis on nature-based solutions relates to emerging ideas of green urbanism, greenspace planning and ecosystem-based adaptation. The literature is vast, and so interconnected with studies on urban ecology that their full assessment goes beyond this review. However, the influence of this terminology is clearly visible in the propagation of concepts such as soft engineering (Kitha & Lyth, 2011), bio-infrastructure (Roberts et al., 2011), biophilic services (el-Baghdadi & Desha, 2017), green infrastructure (Carter, Handley, Butlin, & Gill, 2018; du Toit et al., 2018; Matthews, Lo, & Byrne, 2015), biodiversity and ecosystem service management (Dobbs et al., 2019; Shih & Mabon, 2018; Zinia & McShane, 2018), strategic greenspace use (Mahon & Shih, 2018), or ecosystem restoration (Burger, O'Neill, Handel, Hensold, & Ford, 2017; Sousa & Rios-Touma, 2018). Green infrastructure is thought to provide a radical alternative to conventional mitigation and adaptation responses, which acknowledges, directly, equity concerns (Nesbitt, Meitner, Girling, Sheppard, & Lu, 2019).

Third, a growing strand of research has examined urban climate governance through experimentation (Boyd & Juhola, 2015; Bulkeley & Castán Broto, 2013; Castán Broto & Bulkeley, 2013b; Reed et al., 2015). Experimentation may be an avenue through which civic groups and activists gain access to political processes and build legitimacy for alternative environmental narratives (Cloutier, Papin, & Bizier, 2018). There is also an interest in the mechanisms through which social or technical experiments diffuse or institutionalize and translate into mechanisms of transformation. In particular, concerns about the possibilities of scaling-up or scaling-out, where horizontal replication through networks so far has been most common (Smeds & Acuto, 2018). The embedding of experiments requires the configuration of new actor relations and networks, contestation of hegemonic logics, and the parallel construction of new rationalities (Bulkeley, Castán Broto, & Maassen, 2014; Bulkeley, Luque-Ayala, & Silver, 2014). It has, however, been shown that experiments may reinforce current structures of power and function as non-inclusive mechanisms of knowledge production (Evans & Karvonen, 2014) or support the creation of exclusive elite spaces (Marvin & Rutherford, 2018). In any case, a superficial evaluation of experiments is likely to lead to misunderstandings about what is a desirable outcome and how it is achieved. Castán Broto and Bulkeley (2013a) point to the importance of maintaining experiments through time, which highlights an understanding of climate change governance as a process and foster skepticism about the possibility to evaluate results at a single point of time.

In recent years, this area of research has experienced a resurgence through a growing interest in transformations. Recent work points towards an increased interest in the social learning required to transform urban systems (Wolfram, van der Heijden, Juhola, & Patterson, 2019), which will require the interaction of multiple elements, such as local leadership, empowered communities, and trusted boundary-spanning organizations (Wolfram, 2019). Intermediary organizations may play an essential role in building trust, creating networks, and contributing to facilitate shared construction of meaning in the process of institutionalization (Horne & Moloney, 2019). Yet, higher-order (e.g., triple loop) social learning in urban governance processes is so far modest (Fink, 2019; Shefer, 2019), and it has proven difficult to overcome self-reinforcing mechanisms of existing logics and build legitimacy for new routines (Uittenbroek, 2016). De-institutionalization of incumbent regimes appears similarly challenging to attain (Parks, 2019) and experiments may often fail to deliver institutional change (Madsen & Hansen, 2019). Nagorny-Koring (2019) argues that the so-called “best practice” solutions are characterized by sticky and place-bound dimensions that prevent their diffusion. In terms of governance, this emphasis on “best practice,” she argues, overemphasizes generalizable rather than experiential knowledge, and thus removes attention from the contextual conditions that facilitate deep learning. In spite of the growing recognition that the governance of climate change requires multiple forms of learning—especially institutional learning—some analyses of current experiences suggest that learning-oriented organizations, such as the C40, continue to advocate measures that either lead to incremental change or reproduce the status quo (Heikkinen, Yla-Anttila, & Juhola, 2019).

3.3 | Governing the city within the international climate regime

The political tension between the operation of global political regimes and the impacts in specific locales of action has been a prominent feature of analyses of urban governance, dominated by networked governance theories (Bulkeley, 2010). This tension features as a central theme in a relatively large body of literature (10% of the 383 articles reviewed) which relates directly or indirectly to the concept of multilevel governance to examine the blurring of authority and the proliferation of diverse forms of coordination across government levels and between governments and society.

During the wave of *urban optimism*, this line of research emerged through attempts to, on the one hand, explain the distribution of authority across multiple sectors and levels of government in governing the climate, and, on the other hand, support a celebration of cities in international networks as a new form of transnational governance. Within the former theme, Bulkeley and Kern's (2006) study on modes of governance drew attention to the need for local governments to draw on capacities and resources of other actors to realize emission reductions, in a context of limited reliance on regulatory instruments and an increasing use of "enabling" approaches (an insight that was again highlighted a decade later by Elofsson, Smedby, Larsson, and Nassen (2018)). Multilevel governance research within this theme has focused on understanding collaboration and institutional partnerships between government departments (Roberts, 2010), local government and private sector actors (Lund, 2018), with societal actors (Barton, Krellenberg, & Harris, 2015; Vella, Butler, Sipe, Chapin, & Murley, 2016), or with boundary-spanning organizations (Hodson, Marvin, & Bulkeley, 2013). The underlying assumption is that multilevel governance mechanisms enhance the ability of municipal government to formulate and implement climate plans and supports institutional learning (Benz, Kemmerzell, Knodt, & Tews, 2015; Lee, 2019).

Within the second theme of transnational municipal networks (TMNs), the key concern has been how these organizations move beyond traditional regimes in global climate governance. Bulkeley and Betsill analyzed how municipalities used transnational networks as a means to exercise agency and authority on multiple levels (Betsill & Bulkeley, 2006; Bulkeley, 2005; Bulkeley & Betsill, 2005). This led to new theorizations of scale in climate politics and a reimagining of the role of the "local" in global regimes, creating a platform for further research on how cities shape international relations. Further contributions included recognition of cities in exercising norm entrepreneurship in global discourses (Toly, 2008), new forms of authority produced through consensus building across scales (Bulkeley & Schroeder, 2012), and the rise of the urban as a center of power in global politics (Acuto, 2013, 2016; Acuto & Rayner, 2016).

This body of work also led to an increasing understanding of the dynamic interrelationship between global and local policymaking, and the possibilities of mutual adjustment, complementarily, and cross-scale fertilization of initiatives (Andonova, Hale, & Roger, 2017; Bechtel & Urpelainen, 2015). Betsill and Bulkeley (2004) observed that learning takes place through discursive struggles and that resources supplied by networks primarily include norm generation. Kern and Bulkeley (2009) demonstrated that networks exercise numerous governance functions in the context of the multilevel governance system of the European Union. During the second wave of *urban pragmatism*, such studies fostered interest on the ability of TMNs to facilitate diffusion and adoption of climate policies (Hakelberg, 2014) and their role in capacity-building (Roger, Hale, & Andonova, 2017) and learning (Bellinson & Chu, 2019; Lee, 2019).

Throughout both waves of research, these ideas have been marred by an engagement with the practical aspects of the operation of institutions that enable climate change action. Regardless of how networked they are, municipal authorities are constrained by bounded autonomy which determines their ability to raise resources and make decisions (Romero-Lankao, 2012). Entrenched administrative rationalities and identities inhibit collaboration across government units (Aylett, 2013). Despite the best of intentions, communication, resource sharing, and learning across or between government levels may be weak (Antonson & Carlson, 2018; Araos, Ford, Berrang-Ford, Biesbroek, & Moser, 2017; Jaglin, 2014; Leck & Simon, 2013). Depending on the institutional arrangements across different levels of government (national, regional, local) cities may be overlooked by higher-level authorities (Jones, 2012). Multiple authority-building practices occur outside the sphere of activity of the public sector but may fail to build the legitimacy required for broad institutionalization (Francesch-Huidobro, 2012) or provide secure mechanisms of accountability and monitoring (Bache, Bartle, Flinders, & Marsden, 2014; Butterfield & Low, 2017; Zengerling, 2018).

In their now-classic analysis of climate change governance in four municipal governments in the Gothenburg region, Sweden, Lundqvist and von Borgstede (2008) argued that planning officials resort to established scalar arrangements for collaboration, which may cement existing assemblages of power and lock planning trajectories into pre-defined agendas of growth and development. Similarly, the local capacity to operate in a multilevel context is conditioned by historical-political events, which influences how action is recognized, while also shaping relations and resource interdependencies over time (Eckersley, 2017, 2018). The devolution of power to lower-level authorities does not guarantee more effective climate action (Rumbach, 2016). At the bottom of the theoretical and practical problems of the multilevel governance literature is an ongoing theoretical challenge related to how to insert urban areas within the institutional landscape of nation states or the global climate regime.

The second wave has also fostered in-depth critiques of the role of TMNs. Local autonomy may paradoxically be limited by transnational authority, and thus, there is interest in how global networks reinforce hegemonic structures of power (Chu, 2018a). Other scholars have been skeptical of the ability of TMNs to facilitate action. For example,

participation in TMNs may have little effect on actual greenhouse emission reductions (Bansard, Pattberg, & Widerberg, 2017; Krause, 2012) or on national politics (Gore, 2010), and participation in these networks continues to be skewed towards the Global North (Bansard et al., 2017). While TMNs offer opportunities for introducing new planning rationales at the local level (Davidson & Gleeson, 2015), the ability of global dynamics to change local administrative logics may be limited (Hickmann, Fuhr, Hohne, Lederer, & Stehle, 2017). It is also not clear how cities can be held accountable in transnational regimes (Gordon, 2016). Warnings emphasize the lack of international climate funding on the one hand (Ayers, 2009), and the negative consequences of the involvement of cities in international institutions on the other (Cohen, 2014; Fraundorfer, 2017; Lefèvre, 2012). A return to theories of centralized forms of steering has ensued: the notion of orchestration purports to close the gap between the fragmentation caused by transnational governance and the coordination required to meet emission reduction targets (Chan, Ellinger, & Widerberg, 2018; Gordon & Johnson, 2017; Hale & Roger, 2014).

3.4 | The relationship between climate action and environmental injustice

Turning attention to the deployment of action on the ground has meant that scholars have found themselves moving away from the question of effectiveness while grappling instead with questions of conflict, securitization and control, and the possibility to deliver climate justice in urban areas. Critical urban scholars never fully embraced the wave of *urban optimism*. Instead, they always pointed to the inherently political nature of urban climate governance. These concerns have grown during the second wave of *urban pragmatism* as the impacts of climate action on the urban fabric have become tangible.

Climate change has become an issue in electoral politics and the politics of planning, which has turned attention to how power relations shape these processes, and the presence of conflicts and trade-offs. For example, studies of the integration of climate concerns into conventional party politics highlight how issues surrounding risk, political resistance, and economic benefits are balanced and framed by elected politicians (Foss, 2018; Mullin & Rubado, 2017). As Aylett (2010) observed, conflict and protest are both critical elements in the formulation of political priorities. There are no neutral pathways in the pursuit of complex objectives like urban resilience, and trade-offs are inherent to any prioritization process (Bahadur & Tanner, 2014; Brown, Dayal, & Rumbaitis Del Rio, 2012; Chu, 2018b; Muller, 2016; Reed et al., 2015; Weinstein, Rumbach, & Sinha, 2019). Trade-offs are better tackled through negotiation, shared learning, and deliberative decision-making processes. However, such inclusive processes rarely overcome underlying tensions, which can only be addressed through deep restructuring of political economies (Chu, Anguelovski, & Roberts, 2017). Moreover, there is a need to deliver empirical work that recognizes the formidable barriers to climate planning and action posed by vested interests (Francesch-Huidobro, 2012), the impact of perceptions of economic and political gains (Storbjörk & Hjerpe, 2014), the interference of private companies in planning processes (Hrelja, Hjerpe, & Storbjörk, 2015), conflicting interests across government levels and departments (Cousins, 2017; Jaglin, 2014), elite capture (Berquist, Daniere, & Drummond, 2015) and corruption (Chirisa, Bandauko, Mazhindu, Kwangwama, & Chikowore, 2016).

Climate change can act as a transformative force that reshapes political structures (Dodman & Mitlin, 2015) and creates new political roles for municipal authorities (McGuirk, Dowling, & Bulkeley, 2014). As Chu (2018b) describes, climate adaptation politics in cities in India has produced processes through which state-society relations are renegotiated, where communities gain new recognition as sources of agency and knowledge. However, such processes of institutional negotiation need to be situated in wider contexts of economic restructuring. For example, the shift of authority to private sector actors, alongside the contractual arrangements that have made it possible, constrains the ability of municipalities to control emissions (Monstadt, 2007; Peterson & Hughes, 2017).

For that reason, much critical research has concentrated on the reproduction of logics of control in climate change politics at the urban level. Hodson and Marvin's (2009) notion of urban ecological security has been followed by studies that characterize security as an urban issue Simon and Leck (2010) and, more recently, by studies that aim to define anticipatory action as a means to respond to economic and environmental threats (White, 2016). Carbon control emerges as a powerful discourse in this context, encapsulating an array of new mechanisms of accounting and standardization to produce appropriate rationalities for climate change governance (Gesing, 2018). Climate change becomes a political issue that allows for actors to gain authority over new policy domains, such as housing (Cauvain, Karvonen, & Petrova, 2018; Edwards & Bulkeley, 2017). Attempts to map interconnections within the urban fabric, such as studies of the water–energy–food nexus, reveal similar logics of control (Artioli, Acuto, & McArthur, 2017).

The underlying concern is that urban climate politics is dominated by economic interests and investment opportunities closely linked to a perpetuation of neoliberal logics. Whitehead (2013) distinguishes parallels between climate adaptation agendas and neoliberal interests, in terms of efforts to protect and build (global) capital investment and means of production. Hodson and Marvin (2012) demonstrate how economic stakeholders dominated the formulation of a low-carbon vision for Greater Manchester, which perpetuated the focus on economic growth rather than opening up for socio-environmental change. Ahmed, Nahiduzzaman, and Hasan (2018) argues that adaptation planning in Asian and African cities is based on neoliberal fantasies of a Singaporean development model that ignore the realities of most urban inhabitants.

Municipal climate networks reinforce neoliberal logics in a similar way (Davidson & Gleeson, 2015). Entrepreneurial pursuits are also embedded in sustainability and climate discourse and climate agendas are employed by local authorities as formulas for city branding or new public management programs (Andersson & James, 2018; Béal & Pinson, 2015; Ng, 2019; Saldert, 2017) or continuation of resource appropriation on a global level (Schindler & Kanai, 2018). Scoppetta's (2016) account of post-Katrina hurricane urban politics demonstrates how reconstruction efforts were connected with demolitions, displacement, and continued marginalization behind the politically neutral mask of resilience.

There is also a scholarly tradition examining the underlying causes behind the uneven distribution of urban emissions (Satterthwaite, 2009), the spatial unevenness of local climate change action or inaction (Dierwechter, 2010), the integration of justice dimensions into local climate places (Schrock, Bassett, & Green, 2015), and the interrelationships between risk and gender (Tibesigwa & Visser, 2016) or income and risk (Rasch, 2017). This research has led to increasing recognition that the political-economic structures that produce and reinforce inequalities are the same drivers that create climate vulnerabilities and risk. Efforts to build elite environments simultaneously contribute to informality and marginalization (Rumbach, 2017). Such underlying causes of vulnerability and risk need to be addressed through strategies that seek transformation of political, social, and economic institutions (Chu et al., 2017; Haque et al., 2014; Revi et al., 2014). Similarly, attention to gentrification in the context of low carbon programs points to risks of displacement as a result of energy efficiency retrofits (Bouzarovski, Frankowski, & Herrero, 2018) or beautification projects that may result in land grabbing processes (Anguelovski, Irazábal-Zurita, & Connolly, 2019). This has led to calls that seek to theorize climate change justice at the local scale, for example, with the distinction between injustice caused through omission or commission (Anguelovski et al., 2016), between procedure and outcome (Reckien et al., 2017), or through the development of a rights-based understanding of climate justice (Ziervogel et al., 2017; Ziervogel, Shale, & Du, 2010). These initial advances point to a movement from a critical analysis of contemporary neoliberalism as a driver of climate injustice towards propositional theories with practical recommendations to redress such injustices in an urban context.

3.5 | Engaging with the everyday realities of policy action and change

One gap that needs a closer look in the literature relates to the engagement with the material aspects of mitigation and adaptation. This gap was already identified in the first wave of research (e.g., Bulkeley, 2010), but it never became fully formulated as a theme within the literature, and both the first and the second wave of climate change research in urban areas have overlooked it.

There is indeed research that focuses on rethinking existing conceptualizations of socio-technical systems (Rohracher & Späth, 2014; Rutherford, 2014; Rutherford & Coutard, 2014). Haarstad (2016) proposes that “infrastructural processes” can be understood as a distinct governance form, defined as steering by conditions in the built environment. A focus on the material structures in processes of energy transition (e.g., a metabolic approach) illustrates links between physical structures, institutions, and systems of authority (Edwards & Bulkeley, 2017). However, most related studies are conducted within adjacent bodies of literature (e.g., socio-technical transitions research) rather than within urban climate governance studies. This limitation is compounded with the growth of a gap between rich analyses of urban theory (and related theories of identity and marginality) and climate governance studies.

A handful of studies highlights the socio-cultural dimensions that remain absent in the dominating debates on institutional change and policy effectiveness in urban climate governance research. For example, Cid-Aguayo (2016) explores social narratives of climate change in everyday life, as well as responses that arise from reconfigured assemblages between agricultural practices and relations with nature. This study demonstrates the process through which climate change becomes a force integrated into the daily structuring of objects and construction of meaning. Sou (2018) argues that a rational interpretation of “risks” is not a critical factor shaping responses to climate change impacts.

Instead, Sou (2018, 2019) points to self-build housing process as “principally catalyzed and influenced by the transformation of broader social, cultural and economic processes,” shaped by sociocultural needs and responses to slow-onset, small-scale hazards. Waitt and Harada (2012) explore the value-action gap between known climate effects of private vehicle transport and reliance on driving and conclude that policy studies downplay the role of emotions and identity related to car use. Adopting a theoretical perspective that emphasizes the embodiment of technologies and urban environments, they argue that, rather than reducing mobility choices to a question of rationality and attitudes, we need to understand how multisensorial experiences produce resistance against abandoning the use of the car. Acuto (2014) argues that the search for global solutions often downplays the importance of mundane everyday spaces, which he identifies as the arena where politics are formed. Acuto (2014, p. 352) uses the analysis of waste flows as a means to examine “the ‘everyday’ as a space for localized and routinized politics,” which are linked to individual habits and values that, at the same time, intersect with multiple strategies for waste management and recycling introduced by governmental and societal actors at different scales. Acuto (2014) reminds us of the feminist observation that the personal is political and that the governance of the environment, even at a global level, is inseparable from the mundane.

These few pioneering examples resonate with the rallying cry of critical disaster studies, “there are no natural disasters,” which emphasizes how vulnerabilities are embedded within broader systems of political, socio-economic, and material relations (Perry, 2017). From this perspective, we support calls for a culturally embedded sensitivity towards processes of change, rather than a shift towards the quantitative assessment of indicators that do not capture the complexity of those relations. There is an evident need for a systematic body of work that engages with the material conditions and experiences of climate change action. However, calls for urgent action and aggregate results at the global level tend to distract our attention towards tried and tested forms of action that, so far, falls short of delivering the radical societal change needed to address climate change in the long term.

4 | CONCLUSION

The literature on cities and climate change is lively and has delivered both theoretical and practical insights, from mapping the drivers of climate action to examining the effectiveness of different forms of action. The relationship between local and global politics and the increasingly visible unintended impacts of climate action have become salient themes of this body of literature during the last decade and how these themes have been expressed in the two waves of research has been shaped by the perceived need to respond to the demands of the international climate regime. Here we explore five areas of research: four that already sustain a consolidated body of literature, and a fifth which we think is vital to develop new research. As the sections above show, each area of research opens up unanswered questions. From our vantage point, the key gaps that remain unexplored are mostly related to the need to examine the interactions between multiple policies not only within a municipal plan but also in relation to various actors in the city, who play increasingly undefined roles in delivering climate action.

One surprising finding is that despite calls within the policy arena, the literature on climate change governance in urban areas has shown a limited engagement with the role of private sector actors, particularly considering the important role that businesses have in shaping urban governance (Klein et al., 2018). There is a well-developed critique of the appropriation of climate change action as a new means to advance neoliberal policies of securitization, measurement, and control. While this critical angle has provided useful insights about the interactions between planning, action, and impact, the scant body of literature that engages with the role of the private sector in climate action falls short of examining the possibilities to deliver actual results on the ground.

The “good governance” literature has dominated the past decade of urban climate research. As a result, this literature has struggled to move beyond generic recommendations for improving governance to context- and place-specific recommendations about how to foster change on the ground. This re-centering of the debate around normative ideals of institutional development diverts attention again from the crucial question that inspires research on climate change governance in urban areas today: are we changing, and will that change be sufficient? The increasing urgency of climate change has catalyzed a search for universal solutions that paradoxically may have diverted attention from the material realities and the very individuals that ultimately join and drive climate actions. What is largely missing—although there is a nascent body of work that points towards alternatives—is a sober assessment of the mundane aspects of climate change governance on the ground capable of exploring concerns about what kind of cultural and socio-economic change is taking place, beyond a comparative analysis of the effectiveness of climate policies.

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CONFLICT OF INTEREST

The authors have declared no conflicts of interest for this article.

AUTHOR CONTRIBUTIONS

Vanesa Castan Broto: Conceptualization; data curation; formal analysis; funding acquisition; investigation; methodology; writing-original draft; writing-review and editing. **Linda Westman:** Conceptualization; data curation; formal analysis; investigation; methodology; writing-original draft; writing-review and editing.

ENDNOTE

¹ The systematic review used the keywords “cities,” and “climate change” to find a sample of 899 articles from the database Web of Science written from 2009 to 2019. We then used the function “refine” to select a subset of 383 articles relevant to social sciences according to the Web of Science categories of urban studies, development studies, political science, and international relations. This search included articles tagged for the keywords “urban” or “municipal.” We excluded books and book chapters.

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