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Adapting to climate change: the ultimate challenge for the next half-century of local government?

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ABSTRACT

Climate change will have a disproportionate and asymmetric impact on cities and urban areas, and some of their most vulnerable residents will be at particular risk. Studies have found that some municipalities have done far more to adapt to it than others, but there has been a general lack of funding, implementation and engagement with marginalised groups to help them prepare. We suggest that the unpredictable and evolving nature of climate impacts means that adaptation represents a defining public policy challenge for local governments in the coming decades. We set out the broad epistemological, practical and justice issues that this challenge presents for the practice and study of local government, and argue that addressing it will require new approaches that go beyond discrete and familiar solutions.

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Introduction

Fifty years ago, when *Local Government Studies* (LGS) was launched, the term ‘climate change’ had yet to be coined. In 2024, it is widely recognised as one of the most intractable and important issues facing humanity (UNEP 2023). Indeed, as policymakers begin to grapple with the multiple values and principles surrounding decisions related to climate change (Björnberg and Hansson 2011), it could prove to be *the* defining public policy challenge for the next fifty years and therefore play a key role in shaping local governance

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arrangements over this period. Hitherto, however, LGS has only published a handful of articles focusing specifically on adaptation issues. Scholars have discussed the topic much more widely in engineering or environmental sciences journals, often concentrating on assessing or modelling largely technical or 'nature-based' solutions that could help to adapt to climate threats. This approach risks neglecting the crucial social, human and behavioural factors that governments need to consider during policy-making and implementation. In this paper, we set out what we currently know from prominent interdisciplinary studies into local adaptation, before discussing some of the challenges that policymakers and scholars will face in extending our knowledge of the field over the next half-century.

What we know about local climate adaptation policy

While governments at all levels have discussed the importance of reducing greenhouse gas emissions for around four decades now, local climate resilience and adaptation only became a focus of scientific and political reflection more recently (Castán Broto and Westman 2020; Demiroz and Haase 2019). For example, a growing number of (primarily quantitative) studies have examined municipal strategy documents to identify and track how cities around the world seek to adapt (see, e.g., Olazabal and Ruiz De Gopegui 2021; Otto, Göpfert, and Thieken 2021; Reckien, Buzasi, et al. 2023). While delivering formal planning documents is not, *per se*, an indicator of implemented and effective climate adaptation 'on the ground' (Olazabal et al. 2019), these studies concur that effective adaptation planning is a necessary precursor to effective adaptation practice (Preston, Westaway, and Yuen 2011; Reckien, Buzasi, et al. 2023), and have cast light on the specific policies that cities are seeking to adopt. At the same time, qualitative research has sought to understand the difficulties associated with mobilising support for local adaptation policy (Eckersley, England, and Ferry 2018), often with a focus on potential trade-offs and synergies with mitigation approaches (Shaw et al. 2014).

Previous research has focused overwhelmingly on larger cities in the Global North; as such, we do not know enough about approaches to adaptation in small and medium-sized municipalities (Fünfgeld, Fila, and Dahlmann 2023), the Global South (Hunter et al. 2020) or amongst non-state actors (Eckersley et al. 2023). Additionally, a growing number of studies examine issues of equity and justice – both within and across countries – but they also tend to focus on formal instruments in cities in Western contexts (Cannon et al. 2023). Smaller cities in the Global South are probably less well-equipped to deal with climate challenges than their counterparts elsewhere, but they remain under-researched. Furthermore, although public participation in *mitigation* policymaking is an increasing focus of study (Boswell, Dean, and Smith 2023), there has been little discussion of how *adaptation* will affect local

governance arrangements (although, see Cattino and Reckien 2021). Given that the impacts of climate change are and will be asymmetric (because some societal groups and locations are much more vulnerable than others to severe weather events, and are also less prepared), this represents a significant knowledge gap.

Alongside the unpredictable and evolving nature of climate impacts, municipalities will also need to address intertwined climate, biodiversity and societal crises, as well as other rapidly developed challenges related to digitalisation. Facing these changes will require local governance approaches that incorporate a range of diverse, flexible and adaptable solutions (Walker et al. 2023; Westman et al. 2022), which also raise methodological challenges for researchers. With this in mind, we now set out future challenges and gaps in three broad areas – gathering evidence, practical policymaking, and concerns about climate justice – and suggest ways in which policymakers and scholars might seek to address them.

Research challenges and gaps

Scholars of local adaptation may struggle to overcome several epistemological problems in the coming decades. First, it is difficult to pin down exactly what constitutes adaptation (Singh et al. 2022), and this hinders agreement on standardised metrics and approaches to track outcomes and impacts (i.e., progress). The concept is ambiguous, multi-dimensional and lacks universality, and previous studies have struggled to overcome this ‘dependent variable problem’ (Dupuis and Biesbroek 2013). Second, and relatedly, qualitative studies that seek to identify causation and/or monitor effectiveness (for example, to assess whether a specific initiative improved climate resilience) are inherently problematic, because it is difficult to isolate specific activities that are solely aimed at adapting to the changing climate, and other policies may also contribute to resilience as an unintentional ‘by-product’ (Tompkins et al. 2010). Given that we would also expect non-state actors to try to reduce their vulnerability to climate threats (Juhola et al. 2022), we can see how attributing societal outcomes to public adaptation policies becomes particularly problematic.

Moreover, unless and until a severe weather event occurs, it is extremely difficult to say whether some adaptation initiatives achieved their objectives (Ford et al. 2015) – and, even then, observed weather impacts are often challenging to attribute to climatic changes (Cramer et al. 2014). Recent studies do suggest that local governments are continuously experimenting in this area by approaching monitoring and evaluation in different ways, such as by tailoring tracking systems to their experiences, needs, capacities and resources (Lewis and Olazabal 2021). Nonetheless, it is difficult for researchers to evaluate the effectiveness of public (or indeed private) adaptation

initiatives. In many cases, we may need to rely on the extent to which local policies correspond to climate vulnerabilities, as well as more focused, qualitative, analyses of whether and how municipalities implement their planned initiatives. In other words, in the absence of robust theories and data that provide causal explanations for change, it may be more feasible to focus on the effectiveness, efficiency, inclusiveness and sustainability of *processes* rather than *progress* (the medium- and longer-term results of policy outputs) – or at least to combine these analyses with result-based assessments. Nonetheless, as we evaluate and learn from public interventions on the ground, we expect that more and more context-specific data and diverse knowledge will become available to establish causation pathways, which can then help to recalibrate and develop more effective public policies.

Alongside a focus on specific policy outputs and outcomes, we also need more research into *how* local governments agree and implement adaptation initiatives, and at whom they are targeted. Currently, only a very small proportion of cities include vulnerable groups in adaptation policymaking (Olazabal and Ruiz De Gopegui 2021; Reckien, Buzasi, et al. 2023), and powerful lobby groups may exert disproportionate influence over local decisions about where adaptation resources should be allocated. Although a growing number of studies have examined public participation in local climate policymaking, particularly around mitigation (King and Wilson 2023), their long-term impact on strategy remains uncertain.

Ultimately, these research lacunae can only be addressed by embracing a wider range of approaches, methods and units of analysis. More studies need to adopt qualitative and embedded research methods, including participant observation and ethnographic approaches, to extend our knowledge of local adaptation policy and policymaking. To avoid epistemic injustices, for example, we need to integrate intersectional approaches into the research and practice of adaptation (Terra Amorim-Maia et al. 2022). This requires embracing processes of recognition of diverse local and expert knowledges, actors and phenomena that are important to understand how to make adaptation more effective and transformative to people and ecosystems (Olazabal and Broto 2022). Whilst resource and epistemological constraints will always mean that we can never get a full understanding of what is happening everywhere, a more rounded conceptual and methodological approach, albeit one that is still open to complexity, should help to paint a more complete picture of how localities and communities around the globe are seeking to improve resilience (Eckersley et al. 2023).

Practical challenges and gaps

These knowledge gaps will have knock-on effects for practitioners over the coming decades, because they may find it difficult to identify approaches

that could be applied in their specific contexts. For example, policymakers often struggle to justify expenditure on, or attract funds for, adaptation, because of the uncertainty related to impacts and, therefore, the cost-effectiveness of specific initiatives (Eckersley, England, and Ferry 2018). Although this means that many projects with adaptation benefits are mainstreamed in other sectoral policies and programmes with allocated budgets, it might also inhibit the integration of risk and climate vulnerability information in decision-making, resulting in adaptation policies that are less targeted to local communities' needs overall (Olazabal and Ruiz De Gopegui 2021).

However, research has identified other factors that can hinder adaptation, such as a lack of resources (including funding, expertise and knowledge of the local situation) and poor administrative coordination (Nordgren, Stults, and Meerow 2016). We can see how policymakers could draw on this literature to address adaptation challenges. For example, studies have stressed the importance of collaboration between different state and non-state actors for many years, particularly as they seek to address 'wicked' issues such as climate change (Head and Alford 2015). However, this does not mean that collaboration is easy, particularly where traditional bureaucratic structures militate against more horizontal and cooperative working with non-state actors (Leiren and Jacobsen 2018). Relatedly, the responsibility to adapt does not lie solely with local governments, especially given the many obstacles and barriers that they face in terms of resources and competencies (Nalau, Preston, and Maloney 2015). National and international regulatory, human, technical and economic support is often necessary to ensure that localities can adapt, particularly in the climate-vulnerable Global South, but also across small and medium-sized cities elsewhere (Naylor and Ford 2023). International city networks are also playing a crucial role in activating climate action, knowledge transfer and capacity building across cities of all sizes (Heikkinen et al. 2020). Challenges ahead relate to how to stimulate climate adaptation finance and reduce the 'adaptation gap' by moving from rhetoric to effective action.

Studies also stress that public opinion and leadership are essential for effective adaptation (Olazabal et al. 2019). However, policymakers often find it difficult to mobilise support for adaptation policies, both within municipal governments and amongst local populations. Some studies have found that the experience of extreme weather events can increase public support for climate action (Zanocco and Sousa-Silva 2023). Severe floods or heatwaves can be devastating and traumatic for those involved, and practitioners would prefer not to rely on them to raise awareness of the need to adapt. Nonetheless, we can understand how policymakers might want to remind

local people of such events to reinforce their message, particularly in places with a large proportion of vulnerable residents (Haupt, Laug, and Eckersley 2024).

Defining and ensuring climate justice

Climate justice is frequently discussed in terms of common but differentiated responsibility at the global level (Newell 2022), on the basis that wealthier countries have emitted far more greenhouse gases than poorer states, but are much less vulnerable to the most severe climate impacts (Sultana 2022). However, the concept will have increasing relevance for local adaptation governance in the coming decades, because some locations are much more exposed to climate impacts than others, and some population groups (particularly older people, low-income families, infants, and those with disabilities or the generally marginalised) are much more vulnerable (Reckien, Buzasi, et al. 2023; Terra Amorim-Maia et al. 2022). Since these disparities often reflect existing wealth and opportunity gaps, as well as historical and structural vulnerabilities, climate change risks can exacerbate current inequalities both within and across municipalities (Terra Amorim-Maia et al. 2022). Although recent initiatives such as climate assemblies are addressing some of these concerns from a procedural justice perspective, issues around distributive and spatial justice that are not unique to climate policy (i.e., how public resources are shared amongst societal groups and across locations) remain largely unresolved (Chu and Cannon 2021).

In the coming decades, both academics and practitioners will need to engage with the challenge of defining justice in local adaptation public policymaking and planning, and how this might be achieved in the face of cross-cutting climate, societal and biodiversity crises and vulnerabilities. Local policymakers will need to make difficult decisions regarding where to allocate limited adaptation resources, as well as about how this activity will be funded. Ultimately, some municipalities may take extreme decisions as a result of severe and unacceptable risks. These may include abandoning territories or evacuating properties at severe risk of coastal erosion or persistent flooding if the costs of trying to prevent these eventualities are too great, interventions are technically unfeasible, or populations are too vulnerable to cope with unavoidable risks. Such decisions should therefore seek to limit the profound socioeconomic implications for the livelihoods and well-being of those affected by relocation strategies (Mortreux et al. 2018). Ideally, they will also be led by ethical and scholarly debates about the importance of prioritising vulnerable people and vulnerable places, involving them in decision-making and providing sufficient compensation where applicable (Holland 2017). This should run alongside a public awareness campaign of the nature and scale of changes required to make some locations more climate-resilient.

These equity and justice issues should not only be incorporated into adaptation planning but also considered during and after implementation. Relatedly, policymakers should take account of the risk of maladaptation, namely the potential that adaptation processes result in intentionally or unintentionally negative (or less positive) effects on ecosystems, climate or societal systems, especially for marginalised and vulnerable populations (Reckien, Magnan, et al. 2023). Co-benefits of adaptation are important but should not be pursued at the expense of ecological and societal health and wellbeing or the sustainability of future generations. Academics have only recently begun to consider how these issues may play out at the local level, and policymakers will have a difficult balancing act to perform when taking such decisions. As governance structures to coordinate adaptation planning evolve, they will throw up new questions around the decision-making procedures, resource allocation and power dynamics that contribute towards climate (in)justice.

Conclusions

Since LGS was launched fifty years ago, climate change has gone from a fairly niche scientific theory to a global societal reality. Now that local governments around the world recognise the importance of the issue, and particularly the fact that adaptation presents policymakers with huge challenges regarding the allocation of public resources, we expect the scope and range of studies into local climate (adaptation) governance to increase substantially. Further research into how local actors are dealing with these challenges is of vital importance. In particular, the socio-political (as opposed to the technical) factors that could further help to improve local climate resilience are underexplored. Relatedly, we need more research into climate change's implications for governance arrangements and social and ecological justice, given the asymmetric impact it will have on different communities within cities and across the globe. LGS's focus on local public policy, management and decision-making makes it a prime outlet for such studies and the journal sits in a unique position to contribute to developing frontier scholarship that speaks to grounded local governance needs. We look forward to reading these studies in future issues of LGS.

Disclosure statement

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