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EDITORIAL

Adapting to climate change: promises and pitfalls in the diffusion of solutions

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Introduction

As the impacts of climate change intensify, public actors around the world are increasing their adaptation efforts (Aguiar et al. 2018; Reckien et al. 2023; Schulze and Schoenefeld 2023). Initially, adaptation to climate change was primarily addressed in national and local settings, with modest attention from other levels of governance. Over time, however, state and nonstate actors at different levels have developed support schemes, networks, and (sub)national policies to strengthen adaptation governance by diffusing and scaling-up solutions and policies across jurisdictions. This includes higher levels such as the United Nations (Paris Agreement) and the European Union, which have increasingly emphasised adaptation to climate change, pushing for the diffusion of particular approaches and tools. While horizontal and vertical diffusion dynamics generally have the potential to reduce the risks emerging from climate change, distributional issues and political conflicts may arise if the diffusion of adaptation promotes elements that are poorly compatible with existing governance structures and practices. This raises the question of whether diffusing (local) solutions from the bottom-up and through networks can produce outcomes that are more effective, equitable, and accepted by local actors than top-down prescriptions (e.g. Baird et al. 2016; Bauer and Steurer 2014).

Against this background, diffusion processes and their underlying mechanisms are likely to play an important role in determining the pace, scale, and quality of adaptation. Despite a rapidly growing literature on adaptation, questions such as whether, how, and why adaptation governance and policies diffuse, for what purposes, and whether adaptation diffusion processes can reduce risks while promoting social justice, remain severely underexplored. Overall, the dynamic and global spread of adaptation governance and policies provides excellent opportunities for both theoretical and empirical explorations of the diffusion concept (Schoenefeld et al. 2022).

This Topical Collection addresses some of the gaps in our understanding of adaptation to climate change by exploring the diffusion of adaptation governance and policies. It brings together expert authors from diverse backgrounds who approach diffusion from different but complementary perspectives. It comprises six papers that use a range of qualitative and quantitative methods, applied in the context of single and comparative case studies. They explore the mechanisms underlying diffusion processes, such as coercion, competition, emulation, and learning, as well as the contextual drivers and barriers (Berry and Berry 2018). This includes both horizontal diffusion at the same (e.g., local) level of governance and vertical diffusion across levels, including interactions between national-local and global–local levels. In doing so, the collection offers a critical examination of the goals, effects, winners, and losers of diffusion processes. The empirical data originate from a variety of sources, including literature reviews, content analyses of policy documents and reports, expert interviews, and original large-n surveys. The different methods and

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perspectives complement each other in characterising large-scale patterns of diffusion and in working towards a deeper understanding of the underlying diffusion mechanisms, as well as their contextual drivers, barriers, and consequences.

Adaptation actors and motivations

Three contributions pay particular attention to the actors involved in and affected by diffusion processes in adaptation. Examining the climate adaptation plans of the 25 largest cities in the USA, Cannon et al. (2023) reveal that the diffusion of social justice rhetoric has little impact on adaptation outcomes. Instead, their findings suggest that promoting equitable and just adaptation relies more on the engagement of local grassroots initiatives. Schmidt and Wagner (2023) show how local policymakers in the Rhein-Neckar metropolitan region in southern Germany prioritise issues such as housing and mobility over adaptation to climate change. This prioritisation poses a significant barrier to the diffusion of adaptation policies, despite long-term climate policy commitments. Finally, Klöck et al. (2022) examine the diffusion of hard protective measures such as seawalls in small island states located in the Pacific and Indian Oceans. Their article highlights that learning and emulation processes can, in the worst case, lead to maladaptation as communities replicate seemingly successful solutions without considering specific local needs, capacities, and circumstances.

The multilevel governance of policy diffusion

The next three contributions add to these insights by focusing on both vertical and horizontal diffusion dynamics in multilevel contexts, including how policy diffusion processes can be actively governed. The contribution by Jensen et al. (2023) examines national adaptation strategies and policies in two EU member states and shows how principles of climate policy integration diffuse from the European to the national level (top-down) and vice versa (bottom-up), influencing and reflecting different priorities, objectives, and sectoral interests in the process. The contribution by Schoenefeld et al. (2023) compares local responses to national and regional efforts to promote adaptation to climate change in two EU countries. Drawing on data from large-n surveys and qualitative interviews conducted in Finland and Hessen/Germany, the authors assess how centralised and federal governance architectures contribute to the diffusion of local adaptation governance and policy, and how effective and equitable improvements can emerge from the integration of bottom-up approaches and feedback loops. Finally, Kern et al. (2023) show that the horizontal (network driven) diffusion of local climate change mitigation policies in German cities has evolved into a vertical (top-down) adaptation process associated with new national and regional funding opportunities. These findings underscore the role of external resources and cooperation across levels of governance in diffusing and scaling-up adaptation efforts.

Conclusion

The articles in this Topical Collection deepen our understanding of the role that diffusion plays in spreading adaptation governance and policies. They also provide new insights into how factors such as local benefits, knowledge, political will, or resources influence different diffusion mechanisms. The positive finding is that a combination of vertical and horizontal diffusion can support the emergence of coherent adaptation policies, but this requires active efforts by relevant actors and dialogue between policymakers and other stakeholders. The cautionary finding is that adaptation governance and policies may not diffuse at all if other more immediate interests dominate the policy agenda, or worse, diffusion may contribute to the spread of counterproductive or even harmful solutions, that is, maladaptation. It is important to explore the motivations and structures behind failed or misguided adaptation diffusion to understand how the causes of the problems can be addressed, for example through targeted awareness-raising or changes in incentive structures.

Policymakers generally hope for the diffusion of effective and efficient adaptation policies and actions to achieve a fair and just sustainability transition. This Topical Collection underlines the need for policymakers and other stakeholders at different levels of governance to actively support and steer diffusion towards positive outcomes. This includes open communication with the many different groups involved in climate change adaptation, without whom the great potential of policy diffusion to contribute to fair and just sustainability transitions cannot be realised.

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