**Learning about urban mitigation solutions**

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**Climate change assessments by the IPCC and others put increasing emphasis on cities as key actors in mitigation and early policy adoption. While a coherent understanding of barriers and opportunities for urban climate solutions remains fragmented, there is already a large body of case study literature to learn from and translate into different urban contexts. But a number of practical and conceptual challenges hinder systematic analysis. First, the literature tends to focus on cases in mega-cities or those in wealthy urban areas. By contrast, the majority of the global population resides in much smaller agglomerations, and most of the upcoming urban growth will occur in the Global South where infrastructures are only partially developed. Second, the researched solution space focuses on demand-side measures, but tends to overlook issues of urban form and infrastructure development in growing cities, even as carbon intensive consumption patterns are being locked into place. Third, comparative analysis of cases is sparse and systematic reviews of the literature are virtually non-existent. Given the large scope for learning between cities, but the challenges of generalising from individual studies, we propose a systematic blend of quantitative typologies with qualitative knowledge derived from cases to inform urban climate solutions.**

When it comes to urban mitigation solutions, the key questions are: what works, for whom, under what conditions, and why? Little progress has been made so far. With no consistent epistemology, enormous variety in boundaries of analysis, and a lack of formal research synthesis, urban mitigation solutions remain diffuse and under-exploited.

Systematic learning hinges on aggregating information about individual cities. Recent work emphasises a quantitative direction to this work, using ‘big data’ and typologies to identify structural similarities and path dependencies of development. Similar cities in this sense might draw from the same pool of solutions, or learn from successful examples of reform. But to make this agenda actionable, it will be critical to complement quantitative typologies with an understanding of how underlying social and political conditions can shape (or hinder) urban transformations.

To this end, a sizable body of case study research exists for individual cities, as well as comparative studies across multiple urban settings. These cases often include a rich variety of contextual information on urban-scale projects and reforms, yet are not well represented in the scope of assessment literature on cities. The typical presentation of such evidence tends towards an anecdotal rather than analytical approach – in dedicated boxed sections, as examples of particular phenomena, or within curated libraries of initiatives. Above all, a lack of rigorous literature selection procedures in assessments (and in reviews generally) means that potentially relevant cases remain largely undiscovered – a hidden treasure that is increasingly buried under the exponential growth of publications.

Urban case studies can add to our understanding of climate mitigation solutions, but an overview of the field is urgently needed. Which cities do we know about? What topics do we know about? What comparative and secondary analysis is there of cases? And how can generalizable knowledge be derived from urban cases? In this perspective we address these questions, with a view to developing a more systematic agenda for aggregating knowledge on urban solutions. Overall we identify a rich and varied case study literature, albeit one with regional and topic biases, and a distinct lack of learning on these studies. We propose an approach that blends quantitative and qualitative knowledge to inform urban climate solutions.