PLOS CLIMATE

OPINION

Rethinking climate crisis solutions in Asian cities by harnessing local evidence

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Cities across Asia Pacific are on the frontlines of adverse impacts of climate change. In Jakarta, where frequent flooding is destroying the country's infrastructure, economists estimate that the potential damage due to flooding is 186 million USD per year and that, by 2030, expected floods could increase costs to 521 million USD per year [1]. By relocating the capital from Jakarta to East Kalimantan, Indonesia is acknowledging that the impact of climate change-related disasters will be great enough to prevent the government from functioning. At the same time, cities are plagued by persistent environmental issues–from air pollution to excessive solid waste–greatly affecting the health and well-being of their inhabitants.

Creative solutions to ensuring urban climate change resilience are critical: by 2030, more than 55 percent of the Asia Pacific population (2.3 billion people) will be urban [2]. Urban areas in the region are prone to deep economic inequalities; for example, more than 68 percent of East Asian urban dwellers experience a high degree of informal employment, resulting in instable income and/or lack of benefits [3]. With the rapid pace of development in most cities across the region, widening inequalities will exacerbate the impact of climate change, further hampering economic growth and leading to greater social divisions. Populations affected by discrimination, racism and misogyny, especially indigenous populations, women, youth, and persons with disabilities tend to have fewer assets and means available to adapt to and withstand the effects of climate change and thus suffer the greatest impacts.

While influential institutions–from UNEP to the Intergovernmental Panel on Climate Change–have called for inclusive and equitable local solutions to environmental challenges, scant evidence exists to demonstrate that local communities are systematically included in urban climate change mitigation and adaptation planning. Instead, the vital role of local knowledge and evidence is often missing from existing solutions, with only globally recognized guidance influencing policy and program discussions. In the cases when city populations are included in climate solution processes, the focus is often on engaging citizens in data collection to serve the standard scientific process. Citizen or community science in this regard is merely about applying a participatory process in scientific methodology. As a result, climate actions or policies, though scholarly robust, are not effective and the results are not sustainable.

Bridging global and regional guidance with local knowledge and evidence will likely result in more impactful and sustainable climate solutions. The key is to strike the right balance between three forms of knowledge: scientific knowledge (through standardized methodologies), professional knowledge (practice-informed ideas among policymakers), and local knowledge from citizens, which is often accumulated over the course of several generations, and which provides a crucial understanding of what works in one community and fails in another. Systematic citizen data collection and equity-focused application processes for climate change mitigation and adaptation will ensure approaches include diverse views that

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challenge prior understandings, move research and evaluation beyond a data-gathering and interpretation exercise, even within participatory or collaborative models. Research shows that policies have stronger results when embracing knowledge diversity using all three types of knowledge: citizen science for addressing local context, nurturing locally-led solutions, and leveraging political capital and social legitimacy; professional knowledge related to operational feasibility and implementation mechanisms; and scientific knowledge for technical appropriateness [4]. This shift in thinking about knowledge application is aligned with recent conversations about decolonizing global development, which have included debates about the sources of knowledge used in designing policies.

Climate change and environmental planners are taking notice. In Kathmandu, Nepal, a USAID-funded project is being guided by citizen science approaches: for example, in participating schools, the leadership and parents together conduct air pollution monitoring at the school and in the surrounding community to inform school actions [5]. This resulting data collected from and for use by the school community, which contrasts with other air pollution interventions, where data collection is only analysed for and on behalf of environmental scientists.

In Indonesia, to address the nearly 30 million tons of food waste, one USAID project found that women and youth were excluded from waste management decision-making [6]. Armed with the right local data and input, a promising intervention includes a field school that engages women and youth to turn waste into resources and advocates for scaling up climate-smart waste management approaches and promoting circular economy solutions.

More and more researchers, donors, implementers and policymakers are taking notice that local impact is only possible with local evidence. Effective urban climate change responses must strive to:

- **Maximize inclusivity of all solutions.** To produce equitable, fair and just adaptation outcomes to urban climate change, as highlighted in the 2022 UNEP report, there must be inclusion "of stakeholders as well as local communities, indigenous peoples, women and other marginalized groups into decision-making and co-development of adaptation planning and implementation." This will ensure equity-focused designs as well as the long-term engagement of those most effected by the impact of the solutions.

- **Co-create, co-plan, and review interventions.** A critical intermediary function of these processes is one that links global evidence with local knowledge, and which could be filled by a "regional knowledge service" or similar role. Climate action policy and activities that undergo regular, collaborative planning and reviews through a triangulation process will lead to more effective outcomes. In addition, engaging relevant actors while recognizing, reconciling or managing differing motivations behind their involvement is critical.

- **Make data accessible:** Complex and confusing scientific data often excludes those who will most benefit from that knowledge. Data must be translated equitably to facilitate engagement and learning for all, especially those most affected by climate change.

- **Be agile and adaptive.** Planners must allow for interventions to evolve with learning, especially since urban climate change progress and challenges are fluid and the most effective and sustainable solutions are created through iterative processes. Backed by data drawn from the local context and ongoing feedback from community members and leadership, urban climate change responses must be flexible and responsive to everchanging local needs.

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