The American University in Cairo
CLIMATE CHANGE AUC@COP27

GAPP POLICY BRIEF SERIES

Issue 18, 2022

Are Cities the Causes of or the Solutions to Climate Change?

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Abstract

In many discourses, urbanization is labelled a climate threat. In order to conceptualize cities as a solution to climate change, the discourse on urbanization must be transformed. This transformation should stress the many benefits that urbanization has offered to society over centuries, which drive millions of people to move to cities. There are many opportunities for synergy between meeting global sustainability challenges and pursuing development in urban areas, such as climate co-benefits that promote development, particularly in developing countries where cities are still being built and the path of urbanization can still be changed. Nevertheless, despite the lessons learned to date about urbanization and possible climate co-benefits, there is a lack of understanding of the contextual and institutional conditions that enable synergistic solutions to emerge.

Cities as Opportunities to Tackle Climate Change

The latest report of the Intergovernmental Panel on Climate Change (IPCC) indicates that global emissions of greenhouse gases (GHG) continue to rise, and an increasing proportion of these emissions comes from urban areas (IPCC, 2022). For this reason, cities are often portrayed as polluted and wasteful consumer hubs, where urban inhabitants consume mass amounts of resources and expel their waste to other areas. This portrayal supports the common conclusion that cities are major causes of climate change. Indeed, urbanization rates over time are often more strongly correlated to carbon dioxide emissions than to per capita income (Sethi & Puppim de Oliveira, 2015). In short, urbanization patterns over the last 100 years have clearly contributed to an increase in carbon emissions. Therefore, there is a need to develop a new kind of urbanization in order to tackle global climate challenges.

As an urban planner, I have become used to the discourse that urbanization is an unwanted process that causes harm to civilization (Bulsara; 1964; Gutkind, 1960) and to nature. To transform urbanization and thereby address climate change, it is first necessary to change this discourse. A new discourse must acknowledge the many benefits that urbanization offers to society. An increasing number of people have chosen to live in cities over time because cities are an appealing place to live, offering valued opportunities in terms of jobs and public services. As concentrations of knowledge and financial and human resources (Puppim de Oliveira et al., 2013a), cities also represent a resource to address climate change. There are many opportunities for win-win strategies that both meet global sustainability challenges and advance development in urban areas, such as climate co-benefits that promote development, particularly in developing countries where cities are still being built and the path of urbanization can still be shaped (Doll & Puppim de Oliveira, 2017; Puppim de Oliveira et al., 2013b). For example, sustainable buildings can also improve health outcomes (Balaban & Puppim de Oliveira, 2017). Nevertheless, despite the

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ISSN 2682-3675

many lessons learned about urbanization and possible co-benefits, there is a lack of understanding of the contextual and institutional conditions that enable synergistic climate solutions.

Context Matters: Different Cities, Different Challenges, Different Solutions

Contextual factors, including physical context and a city's development stage, influence how a city can develop a new form of urbanization. Sustainability challenges differ depending on the city, especially between cities in developed countries versus those in developing countries. In developing countries, the key factor in advancing the development agenda is the link between the various objectives for sustainable development in cities. Cities in many developing countries struggle with "old problems" – such as the provision of services (e.g., water, sanitation, energy), housing, and economic opportunities for citizens – while simultaneously trying to tackle "new problems," such as climate change (Puppim de Oliveira, 2013). Developing countries must therefore urbanize in a different way than developed countries and innovate with win-win strategies to achieve climate goals while also advancing development. If citizens and local authorities in developing countries identify a trade-off between socio-economic development and climate change, they will most likely choose the former (Pinto & Puppim de Oliveira, 2008). This priority is explicit in the Rio+20 outcomes; the main document highlights how poverty alleviation and eradication is the main challenge faced by humanity (United Nations General Assembly, 2015). This articulation reflects the pressure of the G77+China group, the block of developing countries that did not accept any constraints on economic development and frame sustainable development as secondary to fighting poverty.

In contrast, many cities in developed countries have significantly cleaned up in the past few decades. Rivers and air in most cities in wealthy countries are cleaner in terms of local pollutants than they were 50 years ago, though a large part of this success is due to transferring production (and polluting) activities to developing countries (McGranahan & Satterthwaite, 2014). The most substantial environmental impacts caused by cities in developed countries derive from consumption, which often drives production, and consequently GHGs, abroad. Citizens in developed countries on average have a much larger consumption footprint than their counterparts in developing countries. The first step for transforming urbanization in developed countries should therefore be to reduce this footprint. Rich countries should prioritize Sustainable Development Goal 12 (responsible consumption and production) in their development agendas by creating specific regulation and economic incentives to reduce their consumption footprints. The second step is to bear a significant part of the cost of the urban transition of developing countries to generate climate co-benefits, allowing cities to avoid the unsustainable path (Doll & Puppim de Oliveira, 2017). A green economy can make sense over the long term, but it can also generate winners and losers in both developed and developing countries. There is a substantial need for investment in the transition toward a greener economy in developing countries to offset the short-term losses, particularly amongst the poor, who will likely bear a large part of the burden, as many receive subsidies on electricity from fossil fuel-powered plants or artificial fertilizers. Finally, developed countries should help to build the institutions and the technological capabilities developing countries need for the transition.

Governance and Institutional Challenges

When dealing with sustainability in cities, there are many challenges related to the institutions of governance. Cities operate in different institutional environments, making the generalization and transfer of knowledge and innovations difficult.

The influence of cities in global governance is growing, but still limited. Cities are constrained in their ability to influence the governance agenda and allocation of resources. In the formal negotiations within the United Nations Framework Convention on Climate Change (UNFCCC), there are not many explicit discussion forums in which cities, as sub-national governments, can express themselves formally and yield decision power. The negotiations instead predominantly focus on the national level, as the parties in the discussions are all national governments. The first step to reframe urbanization in global governance should therefore be to explicitly recognize the challenges and opportunities involved in tackling global environmental problems in urban areas as well as the role of local authorities, as some conventions, such as the Convention on Biological Diversity, have done since 2010 (Decision X/22). In the UNFCCC, cities participate from the sidelines, represented by groups such as ICLEI or C40, which are regarded as NGOs. Some elected city mayors are not even allowed to take part in their country's official delegations. However, cities are the focus of other forums on climate change. The reports of the IPCC contain chapters on cities dedicated to both mitigation and adaptation. The IPCC also hosted a conference on cities and climate change in Edmonton, Canada in March 2018. In addition, cities organize parallel meetings to the UNFCCC Conferences of the Parties (COPs) and separate events on climate change, such as those organized by ICLEI and C40, where city leaders learn from each other and make commitments to tackle GHG emissions that are even more ambitious than national commitments.

Nevertheless, cities' power to make changes is limited. A few cities function as city states (e.g., Singapore), and others as sub-national states/provinces (e.g., the Tokyo Metropolitan Government) or local entities at lower tiers of government. However, many cities depend on national governments to advance their sustainability agenda and to steer urbanization. The degree of involvement and the capacity of cities to tackle global and local development issues varies from country to country (Puppim de Oliveira, 2009). In many countries, sub-national governments have significant autonomy and control important services that impact climate change, such as transportation and building and land-use. In other countries, sub-national governments are dependent on the national or higher-level governments for funding and autonomy to make changes. In decisions about important issues, such as green taxes, many cities do not have the autonomy to make changes. Furthermore, cities confront leakage effects; for example, it does not make sense for a city to impose carbon taxes on fossil fuels if a neighboring city does not do the same. Overall, cities can accomplish a great deal by themselves, but they could achieve more if they were better coordinated with their national governments. Urban governance often suffers from the lack of strong institutions for intergovernmental relations to tackle challenging issues like climate change (Puppim de Oliveira, 2019).

The toughest institutional challenge is the engagement of cities beyond megacities and resource-rich cities. While megacities (cities with more than 10 million inhabitants) are important urban conglomerations, much of the urbanization happens in medium-size cities (between 100,000 and 5,000,000 inhabitants; UN-Habitat, 2016). Yet, these cities rarely feature in the news or participate in C40 meetings. There are more than 100 cities with over 1 million inhabitants in China. India has more than 50 urban conglomerations with over 1 million inhabitants. And in other Asian countries and Africa, urbanization is taking place at a rapid pace never seen before. Asia alone is expected to add a further 1 billion people to its cities in 20 years, with large impacts on climate change if this urbanization pattern is not sustainable (UN-Habitat, 2014). Moreover, Africa is the next frontier of urbanization. Thus, the major governance challenge is to bring medium and small cities onto more sustainable tracks, particularly those in rapidly urbanizing developing countries, which will be fundamental in determining the future of the planet.

Are Cities Leading the Way?

The UNFCCC COP-27 in Egypt could mark a turning point to rethink the role of cities in the process of tackling climate change. Some cities have made commitments that are even more ambitious than those of their national governments. For example, at Rio+20, 59 large cities, including New York and Rio de Janeiro, committed to dramatically reduce their GHG emissions, even without the support of their national governments. The challenge now is implementation, turning commitments into reality and thereby proving that cities can lead the way.

There are many examples of cities that are leading the way with innovative climate initiatives and commitments. Some cities are prime examples of innovative capacity. For example, Curitiba has created an impressive public transportation system, causing its emissions to be much lower than similar cities. Moreover, some of Curitiba's innovations have spread to other cities around the world, such as the bus rapid transit system, which 170 cities have now established (BRT+ Centre of Excellence & EMBARQ, 2019). In Europe, Copenhagen has implemented several important initiatives, such as pedestrian districts and the use of non-motorized transportation (Gemzoe, 2001). Several other cities have followed its steps, with pedestrian roads and bicycles appearing around the globe. In Japan, Tokyo is leading the world with the first cap-and-trade system for GHG emissions that also includes buildings (Roppongi et al., 2017). In China, some cities, such as Shanghai, have committed to significantly reduce their emissions by modernizing industries and improving energy and transportation systems. In addition, Beijing cleaned up for the Olympics with dedicated projects to reduce air pollution and GHG emissions, and many of those projects (e.g., the transportation network) have since continued to expand (Cui & Shi, 2012). And in Africa, Durban has developed several innovative initiatives for mitigating and adapting to climate change, generating jobs and income with climate action (Shih, 2017).

Asian and African cities in particular pose great potential for change and urban innovation, as they are the hosts of rapid urbanization. There are many promising opportunities for co-benefits, such as urban green and blue infrastructure (Puppim de Oliveira et al., 2022), and for rethinking the role of nature in cities (Mansur et al., 2022). In Asia, especially in China, there is a new push for sustainable cities due to central decisions

to achieve energy and pollution targets at the local level. As a result, China is expected to achieve its GHG emissions peak before the initial commitment of 2030. Meanwhile, African cities are modernizing and investing in rail systems, such as Addis Ababa and Johannesburg, and renewable energy. Others have established a tradition of urban agriculture, which can also improve resilience to climate change (Puppim de Oliveira & Ahmed, 2021). The hope is to see a definitive change towards more sustainable cities in Asia and Africa; however, leaders need to move quickly to understand what institutional conditions allow sustainable urban solutions to emerge at a sufficiently fast pace. For example, there is evidence that external sources of knowledge generate more transformative innovation than internal sources (Zambrano-Gutiérrez & Puppim de Oliveira, 2022). Trans-municipal networks can be one of those sources (Picavet et al., 2022). Previous examples of sustainable urbanization efforts, particularly in Western countries, have not been able to mainstream solutions to global and local development issues together. The solutions to global problems have come too late or have not fulfilled all, or even most, dimensions of development in terms of the sustainable use of resources or physical and social conditions.

On the one hand, there is a need to understand the connections among the climate change motives in innovative urban interventions to better assess how these interventions advance (or not) the different dimensions of urban development in the short, medium, and long term. Climate co-benefits are key to avoid advancing in certain goals, but retreating in others, as happened in past urbanization processes. On the other hand, there is a need to gather more knowledge about the social, political, and institutional conditions that enable different kinds of urban innovations and sustainable urbanization patterns to emerge in order to nurture the appearance of those conditions. The multidimensional 2030 Agenda for Sustainable Development, which includes the 17 Sustainable Development Goals (SDGs), represents an opportunity to rethink urbanization patterns. While there are SDGs explicitly dedicated to cities (SDG 11) and climate change (SDG 13), urbanization processes are related to all of the other goals, as most of the world's population now lives in cities. The achievement of SDGs and climate goals is closely related to transforming cities and building the cities of the future.

Acknowledgment
This article relies on a previous article by the author: Puppim de Oliveira, J. A. (2019). Sustainability challenges in an urban century: Can we change urbanization paths to make cities the solutions for rather than the drivers of global problems? *Challenges in Sustainability*, 7(1), 1–4. https://doi.org/10.12924/cis2019.07010001

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Editor: Shahjahan Bhuiyan
Published by the School of Global Affairs and Public Policy (GAPP),
The American University in Cairo.