

Special issue article: *Environmental governance for urban resilience in the Asia-Pacific*

Urban Studies

# Commentary: Inequality, precarity and sustainable ecosystems as elements of urban resilience

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Urban Studies

2020, Vol. 57(7) 1588–1595

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DOI: 10.1177/0042098020904594

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## Abstract

The science of resilience suggests that urban systems become resilient when they promote progressive transformative change to social and physical infrastructure. But resilience is challenged by global environmental risks and by social and economic trends that create inequality and exclusion. Here we argue that distortionary inequality and precarity undermine social processes that give access to public infrastructure and ecosystems thereby undermining urban resilience. We illustrate how inequality and precarity undermine resilience with reference to social exclusion and insecurity in growing urban settlements in the Asia-Pacific region. Inequality and exposure to environmental risks represent major challenges for governance that can be best overcome through inclusion and giving voice to marginalised populations.

## Keywords

ecosystem services, environmental inequality, environmental justice, migration, resilience, urbanisation, wellbeing

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## 摘要

复原力科学表明，当城市系统促进社会和物质基础设施的进步性转变时，它们就会变得具有复原力。但是，全球环境风险以及造成不平等和排斥的社会和经济趋势对复原力构成了挑战。本文认为扭曲性的不平等和不安全会破坏社会进程（正是这些社会进程为人们提供公共基础设施和生态系统），从而破坏城市复原力。我们以亚太地区日益增长的城市住区的社会排斥为例，展示了不平等和不安全是如何削弱复原力的。不平等和环境风险是治理所面临的主要挑战，战胜这一挑战的最佳途径便是提高包容性，并让边缘人群有机会发声。

## 关键词

生态系统服务、环境不平等、环境正义、移民、复原力、城市化、福祉

Received December 2019; accepted January 2020

## Introduction

There is an emerging consensus that communities and individuals exhibit resilience when they have the capacity and opportunity to flourish and live dignified lives, rather than simply cope with adversity and stress placed upon them (Brown, 2016). This realisation has been hard fought, often couched in terms of a battle of concepts and framing between scientific approaches and sub-disciplines (MacKinnon and Derickson, 2013; Welsh, 2014). Yet the core understanding of resilience has always been about the interaction of factors and agents with each other, whether or not these are conceptualised as systems. The application of resilience perspectives to the urban realm reflects the realisation among planners and policy makers that urban systems are not isolated or controllable in a meaningful manner and, further, that urban resilience is fundamentally driven by place, identity and the possibility of flourishing futures.

At the same time, the science of global change provides ample evidence that urban spaces are at the frontline of causing global environmental disruption and that they are a crucible where future global changes will be real risks for large parts of societies (Brelsford et al., 2017; Seto et al., 2012).

Global environmental changes are now integral to how cities are managed and to their future risk profiles. The resilience of urban populations is therefore, we argue, directly contingent on sustaining ecosystems that regulate water, air quality, micro-climates and availability of primary productivity including the production of food and fibre.

Here we build on the established dimensions of urban resilience to examine the research frontiers and the governance implications of incorporating resilience into holistic concepts of wellbeing. Cities are sets of social infrastructure and ecosystems as well as people interacting with nature. The ability to flourish within such systems can increasingly be measured in multiple dimensions (Szaboova et al., 2018). Emergent life-course and life satisfaction metrics of wellbeing and insights into social stress and mental health all expand the means by which urban resilience can be measured and addressed. Yet, precarity and inequality are pervasive non-resilient outcomes in urban settings globally and, indeed, many types of cities are characterised in such dimensions. A key question is whether the socially undesirable outcomes of inequality and social marginalisation are amplified or driven by the unsustainable use of urban ecosystems. Acute precarity is also manifest in cities through migration and the

arrival and non-integration of new migrant populations. What, then, are the governance implications of making urban resilience central to environmental management of these spaces?

### Cities as resilient systems

Social-ecological systems such as cities are sets of infrastructure that potentially exhibit resilience. Resources that are publicly and privately held, along with social infrastructure, fundamentally affect the stability and distribution of communities and populations. By infrastructure, following Anderies and colleagues (2016), we mean the physical structures and organisational structures required to manage the use of and maintain the functioning of shared resources. In other words, the infrastructure of cities that is a key component of their resilience is in effect an intermediate asset that produces human wellbeing rather than being an asset that is intrinsically significant. This idea, that city infrastructure includes information beyond physical structures, is central to many conceptualisations of urban resilience. Meerow and Newell (2019), for example, argue that networks and energy flows are themselves part of urban infrastructure but that resilience should be assessed 'for whom' rather than 'for what'.

The social infrastructure of cities includes its buildings and physical structure as well as green space. Increasingly green space is recognised not just as a resource but also as an opportunity to plan with nature and create meaning and identity. A long history of epidemiological and micro-scale geographical research has shown how green infrastructure represents a major resource for cities, providing nature's benefit for people in multiple dimensions, from reducing urban heat island effects, to regulating water, through to aesthetic dimensions (Hansen and Pauleit,

2014). The physical and mental health benefits for groups are well recognised, as well as the social distribution of access and the role of green space in countering obesogenic environments (Alcock et al., 2014; Barthel et al., 2015; Stoltz and Schaffer, 2018). White et al. (2019) demonstrated that time spent in outdoor green environments provides measurable health benefits, including reduced symptoms of anxiety and stress. And while such studies suggest that access to water and coastal environments appear to have greater absolute impact (MacKerron and Mourato, 2013), urban green space is a major resource because of its accessibility. Accounting for these measurable benefits involves, inevitably, a focus on individual responses aggregated to population levels. Urban green spaces also represent sites for consultative planning, social protest, food production and resistance to maldistribution of power and hence what Anderies et al. (2016) refer to as pure social infrastructure.

The material benefits of economic activity in urban systems to individuals and for macro-economic development are widely recognised and celebrated, and the positive sociocultural impact of growing populations is well established (Fainstein, 2014; Putnam, 2007). But economic development has long been recognised to have multiple dimensions in terms of wellbeing and what it means to live well (Gough and McGregor, 2007; Szaboova et al. 2018). Material, subjective and relational aspects of wellbeing are now recognised as an outcome of conscious and subconscious engagement of individuals in the political, social, cultural and economic realms of life (Coulthard et al., 2018). The focus on the economic dimension downplays the non-material wellbeing dimensions, social marginalisation and discrimination, subjective dimensions of wellbeing that are central to the lived experience; and stress of urban life manifest in mental health outcomes.

## Inequality and exclusion as threats to resilience

Inequality in cities is manifest in patterns of disadvantage and in ‘fissures in the civic infrastructure’ (Sampson, 2017: 8957) that make cities less resilient. A key question is how inequality is an outcome of interaction between social and environmental factors. Sampson (2017) suggests that the principal manifestations and causes of inequality are concentrated pockets of exclusion and poverty, fragmented civil society, exposure to violence and high levels of institutional mistrust. But spatial inequalities are also driven by environmental factors. Low-income groups in many cities globally cluster in neighbourhoods characterised by insecure tenure, high rents, poor access to services and labour markets, and disproportionate exposure to environmental hazards such as flooding or landslides (Chu and Michael, 2019). Thus, precarity in urban settings is entrenched in the informality of settlements and livelihoods and reinforced by truncated citizenship and precarious labour.

Both inequality and precarity are challenges to resilience. The concept of precarity most commonly focuses on labour dimensions: precarity is often described for low-skilled migrants engaged in work that is insecure, involving long hours and low wages with little legal protection (Platt et al., 2017). These conditions, however, represent wide asymmetrical power relations running through systems of urban life. The processes that enable dense urban neighbourhoods produce uncertainty and instability that mediate almost every aspect of urban residents’ access to basic services such as water, electricity, affordable housing, education and healthcare. Thus, precarity becomes an enduring feature of the human condition that goes beyond labour conditions and penetrates the lived experiences of underprivileged and vulnerable groups or individuals

(Ettlinger, 2007). These experiences of precarity vary among urban residents, depending on age, gender, race and ethnicity in addition to social and economic status. Experience of precarious living in a city will again be different for a person with disability compared with those not disabled. Gender and disability cut across all social and economic groups.

Resilience is also challenged by the mobile and transient nature of populations. The level of attachment to place and investment in the future have positive virtuous spirals when it comes to community resilience. Song et al. (2019), for example, show with data from Beijing how integration of migrant populations into cities, measured as trust in authorities, positively affects sense of place and even environmental citizenship and behaviour. Bott and colleagues (2019) similarly show that community coherence and social capital in Jakarta are critical for how populations respond to hazards such as flood risk and air quality (cf. Waters and Adger, 2017). The movement of people to urban centres through migration therefore represents simultaneously an acute challenge to urban resilience and just cities, and an opportunity for transformation of the lives of those involved.

The integration of migrant populations is a significant challenge for resilience, particularly because not all migration experiences are positive, and the wellbeing of new migrant populations in cities is often constrained by social processes of inequality and social exclusion. Many low-skilled migrant populations cluster in areas of cities that have high-density housing, and are exposed to high levels of pollution, risks to public health or environmental hazards such as poor air quality (McMichael et al., 2012; Montgomery et al., 2013; Waters and Adger, 2017). Evidence from China and India points to an increased incidence of non-communicable diseases in cities with high levels

of rural–urban migration. The trends in ill-health are partly explained by changes in diet and behaviour but also by reduced physical activity and access to public space (Gong et al., 2012; Yadav and Krishnan, 2008). Migrants not only face elevated risks of mortality and morbidity because of physical ill health but also experience poor mental health outcomes. For instance, it has been shown that migrants in Chinese cities suffer from high levels of stress and anxiety resulting from experiences of marginalisation and exclusion in the realm of their economic and social existence in the city (Wong et al., 2007).

These accumulated risks represent major challenges to both material and subjective elements of wellbeing. Empirical work has demonstrated that while migration is seen as an adaptation response to climate shocks and environmental change processes that threaten rural livelihoods, rural–urban migrants are often confronted with alternative manifestations of precarity in their urban destinations because of structural constraints. For example, Natarajan et al. (2019) demonstrate, through the experience of debt-bonded farmers-turned-kiln workers in the Cambodian capital Phnom Penh, that while choice and agency are inherent within the concept of adaptation, in reality these are often constrained by structural factors that reinforce rather than reduce precarity and thus hinder successful adaptation and long-term resilience.

Our own research in Chattogram also shows that insecure tenure, material aspects of wellbeing, access to services and labour markets and health issues associated with waterlogging and waste pollution constitute an experience of urban precarity self-identified by migrant populations (Siddiqui et al., 2019). Using survey and in-depth participatory methods, we have shown that many of these dimensions of insecurity are producing levels of mental ill-health,

including reported symptoms of stress and anxiety. The research also highlights the diversity of experience: social exclusion in respect to the labour market, health and access to civic amenities differs on the basis of gender, age, ethnicity and location. Without access to social infrastructure the dominant mode of cities is far from resilience or social sustainability for new migrant populations. In the context of rapid urbanisation, therefore, where the wellbeing and resilience of new populations is constrained by structural factors that perpetuate precarity, the integration of migrant groups into urban planning and governance is key to building safe and sustainable cities as articulated in the Sustainable Development Goals related to urban areas (Adger et al., 2019).

This emerging research on outcomes in cities demonstrates the value of new methods and insights into the social dynamics of resilience. These include the use of narratives and constructivist approaches to understand the relationships between infrastructure and movement and behaviour, and how different factors converge to produce collective as well as individual experiences of wellbeing. Such methods have shown how empathy can be developed between new migrants and urban planners of different institutions by creating scope for reflection and knowledge generation involving both groups. Constructivist approaches to understanding scale and in-depth inclusive methods, such as using narratives to study peoples' accounts, experiences and stories, help to understand how they construct meanings of resilience (Brown et al., 2019).

## **Governance and the search for resilience**

What are the means to overcome intransigent spatial and social inequalities at the heart of threats to urban resilience? The focus of much action and research has been

on sustaining the underlying ecosystems and infrastructures that provide benefits. But the organisational and social dynamics of their sustainability are often under-emphasised. Sampson (2017) and others refer to the role of collective efficacy in social dynamics, including the extent of social cohesion and shared expectations for informal enforcement and control of social norms. In other words, levels of trust and looking out for each other are integral to social resilience in these contexts. Promoting such trust and cohesion is indeed the core function of states in whatever form they take.

A further insight from resilience is that diversity counts and adds stability to systems. Hence there is a sense that distributed and polycentric governance has the potential to enable resilience and social sustainability at different scales (Ostrom, 2010). Cities are often characterised as being naturally polycentric and being inherently resilient through experimentation and adaptive learning (Broto and Bulkeley, 2013). Critiques of polycentric governance focus on the inability of organisations to co-operate across scales, and the lack of recognition of structural or framing power in setting up localised governance systems (Morrison et al., 2017, 2019). However, across multiple systems has now shown how polycentric governance can be stable and effective, providing organisations cooperate and compete in open and constructive ways, learn from each other and have effective means for conflict resolution (Carlisle and Gruby, 2019). Inequality, driven by social and environmental factors, is widely dispersed in cities and represents a threat for resilience. Urban inequality is manifest in disproportionate exposure to environmental risks and hazards, coupled with constrained access to services and infrastructure. These challenges can be overcome by employing innovative participatory methodologies that capture the lived experiences of marginalised groups, unpack the relationship

between movement and infrastructure and serve as a platform for building empathy between urban planners and migrants.

### Declaration of conflicting interests

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

### Funding

The author(s) disclosed receipt of the following financial support for the research, authorship, and/or publication of this article: Funding is acknowledged from the UK Economic and Social Research Council and Department for International Development under the Development Frontiers research programme (Grant ES/R002371/1) and from Migration, Transformation and Sustainability Belmont Forum Transformation to Sustainability programme under the UK Economic and Social Research Council (Grant ES/S007687/1).

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