



Fluid engagements: Responding to the co-evolution of poverty and climate change in Dhaka, Bangladesh



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ABSTRACT

Most individuals living in low-income households in cities like Dhaka, Bangladesh, reside in informal, high-density settlements that experience exacerbated vulnerabilities from climate change. When determining development approaches that take into account future needs for adaptation, community residents and the professionals and policymakers who support these communities must consider the existing challenges associated with living in poverty, the rapidly increasing rate of urbanization, and future climate risks. The key objectives of this paper are to expand the understanding of the co-evolution of these “wicked problems” and the need for developing alternative strategies for adaptation.

The paper explores the organic creativity of residents living in informal settlements as they draw upon locally available resources to create situation specific, pragmatic solutions to locally defined challenges. We term this practice “fluid engagement,” a design approach that aspires to be flexible, situated, pragmatic and participative, and demonstrates a willingness to be open to heterogeneous combinations of purpose and programs. Critically, “fluidity” suggests a participative approach to design that takes into account the “voices” beyond the policy and professional nexus to the participation of the community.

This paper aims to connect emerging literature concerning the urban practices of low-income households in cities of the South with a detailed case-study analysis of the spatial practices at the micro-level in an informal settlement in Dhaka. The paper contributes to a new agenda of architectural and urban-development research that engages with issues of poverty and climate change as a process of co-evolution.

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1. Introduction: Co-evolution of urban poverty and climate change

Urban climate change-related risks are increasing with rapid urbanization and rapid growth of large cities in low- and middle-income countries with highly vulnerable communities living in informal settlements (Revi et al., 2014a). The likely direct impacts of climate change and variability in urban areas include rising sea levels and storm surges, heat stress, extreme precipitation, pluvial and fluvial flooding, landslides, drought, increased aridity, water scarcity and air pollution with widespread indirect impacts on

people, economies and ecosystems (Revi et al., 2014a). Dhaka, the capital city of Bangladesh, ranks as one of highest with exposure to climate extremes among the top 20 cities globally (Hanson et al., 2011). The city is exposed to multiple types of climate-induced hazards including variations in temperature, excessive and erratic rainfall, water-logging, flooding, cyclones, and heat and cold waves (Rabbani, Rahman, & Islam, 2011). The low-income households of this fast growing megacity are considered to be most vulnerable from the direct and indirect impacts of climate hazards (Banks, Roy, & Hulme, 2011; Rabbani et al., 2011).

Differential exposure and vulnerability to climate hazards often arises from non-climatic factors and from multidimensional inequalities produced by uneven development processes (IPCC, 2014). Whereas there is no universal direct correlation between poverty and vulnerability—and there does not have to be (Arora-Jonsson, 2011)—poverty usually leads to greater vulnerability,

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and vulnerability arising from climate change often leads to outcomes that perpetuate poverty (Eriksen & O'Brien, 2007). Taking the interrelationship of poverty and vulnerability into consideration, climate change has been defined as a “wicked problem”. Finding solutions for such problems is often difficult because one aspect of a wicked problem often reveals or creates other, even more complex, problems that demand further solutions, creating complex interdependencies in the system affected (Hulme, 2009).

Vulnerability to climate change is a function of three factors: exposure, sensitivity and adaptive capacity (Adger, 2006; Parry et al., 2007). Exposure to physical hazards in urban environments may be similar for different population groups; however, poverty influences the sensitivity and adaptive capacity of low-income households across a range of issues. These include: greater environmental and health risks resulting from high-density living; proximity of residential areas to industrial sites; poor access to clean water and sewerage services; traffic congestion that leads to air pollution and risk of accidents; a higher degree of commercialization of exchange, hence reliance on cash for basic needs such as food, shelter, wood for fuel, and basic services; and more social diversity, which can lead to less social support, greater fragmentation and higher crime rates (Jarvis, Kantor, & Cloke, 2009). Sustainable adaptation policies and interventions for low-income households in informal settlements in urban areas lead to a need to focus on areas of overlap between poverty and vulnerability (Eriksen & O'Brien, 2007) and may be viewed as synonymous with development (Ayers & Dodman, 2010).

Understanding the co-evolution of climate change as a “wicked problem” and exploring strategies for adaptation are key challenges facing researchers and policy-makers seeking to understand and promote sustainable design in the South. This paper seeks to make a contribution to this debate by engaging with the emerging literature concerning the urban practices of low-income households in cities of the South through a detailed case-study analysis of the spatial practices at the micro-level in an informal settlement in Dhaka. The paper deals with both the direct and indirect impacts of climate change and addresses issues of poverty and climate change as a process of co-evolution. By utilising detailed architectural analysis of adaptation practices the paper hopes to contribute to a new inter-disciplinary agenda of architectural and urban-development research committed to understanding the actions of poor people as ‘architects’ of their own sustainable future.

The paper firstly examines the significance of the built environment in reducing or enhancing risks that arise from changes in the climate variables as a conceptual framework. We then present a case study of spatial practices in one informal settlement in Dhaka and the climate risks arising from—and in—the built environment. We proceed to analyse those spatial practices to assess how they aid communities respond to climate variability and then in turn to consider how a concept of fluid engagement might be useful as a possible framework for exploring climate risks in informal settlements more generally.

2. Conceptual framework: Adaptation in the built environment

From a co-evolution perspective, the access and quality of built environments influence potential physical and economic losses, injuries and fatalities from physical hazards (Cutter, 2006), and the ability to take adaptive actions (Jabeen, 2014) for households or communities. Physical assets (e.g., housing, infrastructure, collective land, community facilities) are essential as a resource for

generating economic, psychological, social and political assets that foster resilience and social mobility. The accumulation of assets can raise a low-income household above the threshold level beyond which the responses to reduce risks come into effect and reduce the negative effects of climate change. On the other hand, without access to housing and infrastructure, households lose different types of assets and are forced to cope continuously with chronic challenges. The cumulative effect of the depletion of assets influences householders' ability to prepare for future risks as well—thus the household remains beyond the threshold level for taking any adaptive action. Access to a resilient built environment means the scale of “taking action” is transformed from simply developing coping strategies (Wisner et al., 2004) to building “transformative” adaptive capacity (see Fig. 1).

With increasing exposure to climate hazards, low-income households in informal settlements often make adjustments in their physical, ecological and human systems and take anticipatory and reactive actions (for example, see Jabeen, Johnson, & Allen, 2010; Jabeen, 2012; Jabeen & Johnson, 2013; Roy, Hulme, & Jahan, 2013; Haque, Dodman, & Hossain, 2014). Some of these actions may build “resilience”—refining existing practices, or provide a step towards “transition”—changing incrementally by realizing full system potential (Pelling, 2010). However, adaptation can be perceived as “transformative” in nature as well succeeding from only “resilience” or “transition”. The significance of transformative adaptation arises from questioning the creation of structures, systems, and behaviours that contribute to climate change, social vulnerability, and other environmental problems in the first place for large population groups as well as considering severe climate change that overwhelms even robust human use systems (Kates, Travis, & Wilbanks, 2012; O'Brien, 2011). Where systems are primary drivers for risk and loss, transformative adaptation opens policy choices to consider both social justice and risk-management concerns (Pelling, 2010; Revi et al., 2014b).

While we must beware romanticising the sometimes heroic efforts of communities to reshape their built environment, a deeper appreciation of the practices of low-income households living in informal settlements might help us rethink the role of local knowledge and action in generating an “indigenous” sustainability that addresses both poverty and vulnerability to climate change and is arguably more applicable to, the South (Eriksen & O'Brien, 2007).

3. Case study: Spatial practice in an informal settlement in Dhaka

This paper explores the co-evolution of poverty and climate change, drawing from a study in an informal settlement, Korail in Dhaka (Image 1) conducted between 2009 and 2012. The study adopted qualitative research methods to consider a number of variables, namely urban poverty, climate extremes and adaptive capacity within the complex reality of the city. The study used different participatory tools including transect walks, participatory mapping, timelines and causal flow diagrams to investigate both climate risks and household and community assets. Twenty-six households were interviewed using semi-structured questionnaires; each of the household's dwellings was measured, sketched and photographed to capture the spaces and activities. Some residents provided details of the construction techniques and these were also documented visually. In addition, 21 focus group discussions took place with 180 respondents, representing a range of interests and situations within the community.

Qualitative data provided insight into issues that were significant to the residents living in the settlement. As in many other

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