

**BUILT-IN RESILIENCE: LEARNING FROM GRASSROOTS COPING  
STRATEGIES TO CLIMATE VARIABILITY**

**Huraera Jabeen**

BRAC University, Bangladesh  
huraera@bracu.ac.bd

**Adriana Allen**

University College London  
a.allen@ucl.ac.uk

**Dr Cassidy Johnson**

University College London  
cassidy.johnson@ucl.ac.uk

**Summary:**

Significant lessons can be drawn from grassroots experiences of coping with existing environmental hazards to reduce vulnerability of the urban poor. Knowledge of existing coping capacities for disaster risk reduction can help to strengthen planning strategies for adaptation to

## **BUILT-IN RESILIENCE**

The paper is organized in three sections. The following section sets the background by establishing the relations between adaptations, disaster risk reduction and coping strategies for urban areas. The next section summarizes the existing coping strategies of the urban poor in Korail, using the findings of the survey data. It highlights how the urban poor effectively use physical, economic and social means of gaining access to safety, reduce their loss and facilitate their recovery. The third section discusses how local planning and governance mechanisms aimed at adaptation can support these existing coping strategies and provide recommendations to mainstream them into adaptation plans that can be scaled up at the city wide level.

## **II. LOCAL COPING MECHANISMS FOR ADAPTATION AND DISASTER RISK REDUCTION**

### **1. Making the links between adaptation and disaster risk reduction**

The integration of disaster risk reduction and climate change adaptation is narrowing, as these two fields come closer together in understanding that reducing socio-economic vulnerability to hazards or effects from climate change, amount to similar schools of thought (Schipper and Pelling, 2006; Tomalla et al., 2006). The two fields use subtly different language to describe similar activities. From the field of disasters, the term ‘coping capacity’, is concerned with the means by which ‘people or organizations use available resources and abilities to face adverse consequences that could lead to a disaster’ (UNISDR, 2009). In the climate change field, the term ‘adaptive capacity’ is used, the Intergovernmental Panel on Climate Change (IPCC) assessments use the definition “The ability of a system to adjust to *climate change* (including *climate variability* and extremes) to moderate potential damages, to take advantage of opportunities, or to cope with the consequences.” (IPCC, 2007, p. 18). Satterthwaite et al. (2007) relates this definition to the urban scale, thus

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and thus are more susceptible to flooding. Lack of open spaces and little green areas mean that informal settlements may suffer from higher temperatures.

### **III. CASE STUDY: KORAIL, DHAKA**

#### **1. Vulnerability of Dhaka**

Bangladesh in general is vulnerable to climate variability and climate change because of its geomorphologic location. The capital city Dhaka has experienced 9 major floods in the last 55 years among which the ones of 1988, 1998 and 2004 were severe due to overflowing of surrounding rivers. Flooding from excessive rainfall also cause severe problems in certain parts of the city, which are inundated for several days mainly due to drainage congestion and inadequate pumping facilities. In addition the city experiences ‘heat island’ problems where the temperature is a few degrees higher than the surrounding areas. These affect infrastructures including water systems, housing and settlements, transport networks, utilities and industry. The 3.4 million urban poor living in Dhaka with limited or no access to services and poor living conditions are considered highly vulnerable among all the city dwellers (CUS, 2005). In addition to physical impacts the vulnerability increases through unsecured livelihoods, increased health risks and constrained economic activities.

#### **2. General description of Korail**

The informal settlement in Korail, considered being the biggest slum in Dhaka, started to develop during late 80’s on the vacant higher grounds. Eventually the settlement expanded encroaching the highly vulnerable water edges. At present Korail covers an area of approximate 90 acres with an estimated population of over 100,000 (CUS, 2005). The eastern and southern edge of the area is defined by the Gulshan-lake, a main water reservoir for the adjoining areas. Because of its location near the high-end residential and commercial (Gulshan, Banani and Mohakhali) areas of Dhaka it attracted low income people engaged mostly in service jobs like cleaners, household helpers, rickshaw pullers as well as worker of ready made garments industries.

High density of population without proper services and location in vulnerable water edge impose threats from climate variability and climate change. Security of tenure is one of the major concerns for the area. Since two government organizations own most of the land, ownership of land acts as a threat of eviction. The insecurity has caused reluctance among service providing authorities to give legal access to city wide system although inhabitants pay higher prices for water and electricity to the illegal providers. Also the inhabitants living as long as even 20 years are unwilling to invest in improving the living condition. High density self help housing in the area developed without any government intervention. Different NGOs worked in the area to develop segmented drainage, sanitation, garbage disposal as well as non formal education and healthcare facilities. People of Korail experience climatic hazards almost every year from excessive rainfall, increased heat and flooding.

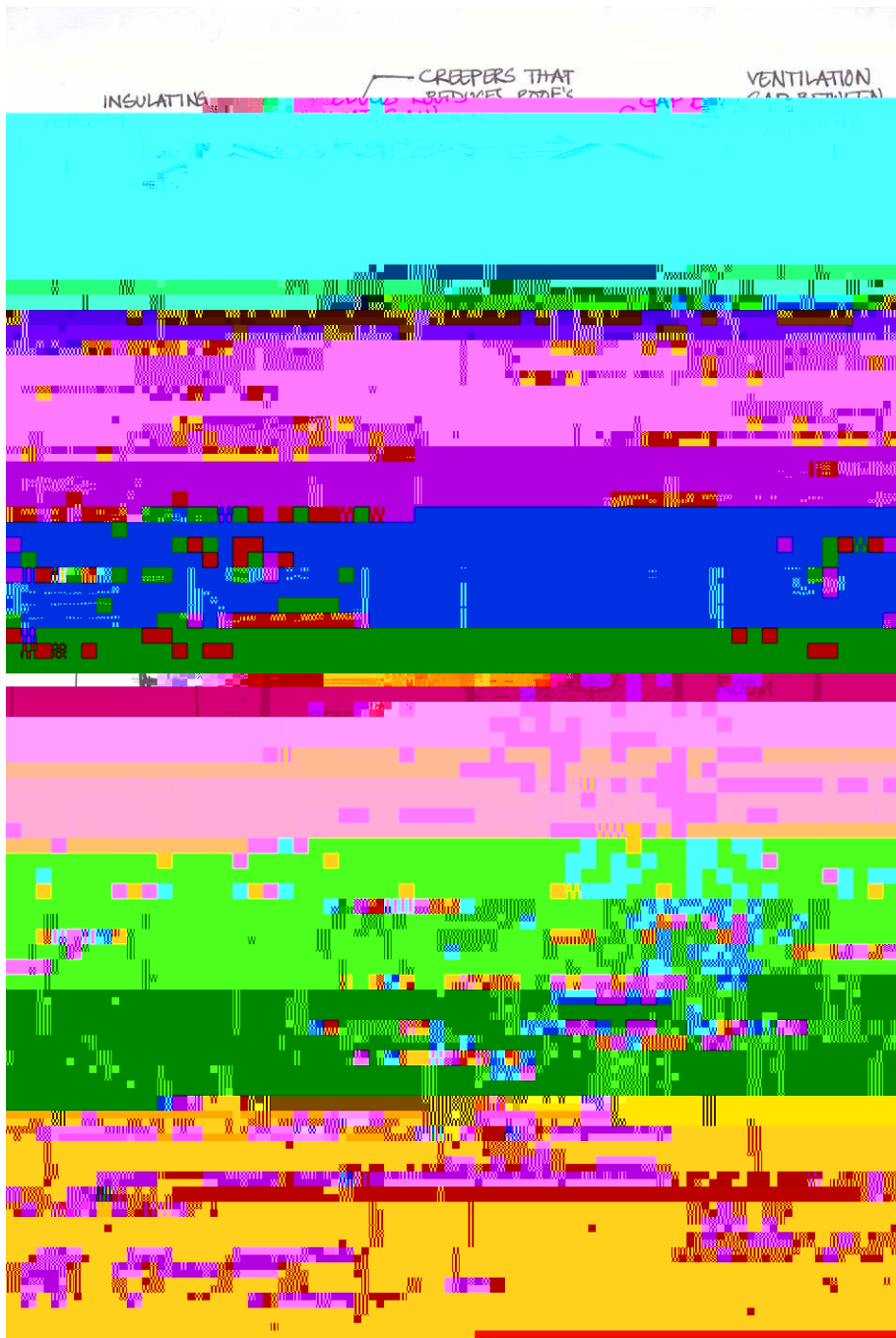
### **3. Methods**

A small qualitative survey has been done among 35 households to identify their experiences of climatic variability, hazards and coping strategies. The households have been chosen randomly based on the criteria of location, condition of houses, ownership and period of tenancy. Among the 30 households finally documented, 14 lived near the water edges, highly susceptible to

#### *4.2 Economic abilities*

There is a wide variation among the earnings of individual as well as combined household.





. Fig 2: Typical house arrangements Source: Author

drainage facilities are unavailable. Maximum households increase height of the furniture at least 6 to 9 inches (2 or 3 bricks) depending on the location. In Korail most of the rooms are arranged in courtyard type pattern, adjoining rooms facing a narrow passage like shaded courtyard. Typically one household occupy a single room where as better off households use two rooms. To reduce the heat in the rooms made out of CI Sheet creepers are grown in the courtyards to cover the roofs. Also most of the household use some form of false ceiling materials or canopy made out of cloths. This is a popular practice in rural areas that has been brought forward in urban shelters.



In Korail during any disaster moving to safer areas is not a preferred options as moving means losing the assets, social and livelihood network and chances of losing right to live. This can be argued as emotionally oriented strategies of adaptation. During flooding or water clogging the most practiced option is to sleep on furniture above flood level and use movable cooker for food preparation. 14 out of the 30 households shared services of the unaffected neighbours. Some temporary measures were also taken like making higher barriers at the doors, making outlets at the house for easy flow of water, develop alternate means of access, build higher stilts inside the rooms, and community initiatives to clean drainage and move most effected families to safer spaces within the neighbourhood. 30% of the households suffered from food shortage during the pervious flooding and elongated water clogging. Only 16% shared food with neighbours while 27% borrowed money from their savings and others to tackle hardship.

To cope with the increased heat most of the households (70%) increase their power usage and buy additional electrical equipments during summer. Generally closely space structures create shaded courtyards that are used as open space for ventilation and hold outdoor household activities during frequent power shortage. Also the use of different insulating materials reduces the heat from CI sheet roofing and partitions. People use various kinds of recycled materials like paper, styrofoam, packing boxes, cement bags bamboo mats and old clothes for insulation.

After any disaster like flooding and water clogging 18 out of the 30 households rebuild their structures in someway from changing building material, increasing plinth level, changing materials for plinths to changing structural, roofing and walling materials. 30% households took loans and got help from the household members or neighbours for the purpose. There is a common practice among the households to save not only money but also building material through out the year for rebuilding after any future disaster. Only less than 4% preferred to move to new locations after the last disaster as they are mostly renters.

### *5.2. Economic strategies*

Savings is seen as a main coping strategy for most of the households. 50% household saves regularly with savings groups or NGO with an intention that they can take loan from their savings during and after any disaster. Usually the savings groups are formed within extended families, neighbourhoods and wider groups who have shared geographical identity. They create a social and livelihood network through savings. The amount saved varies between BDT 200 – 2800 per month forming 3-17% of total household income. Usually these households have more than one earning members or source in diversified professions.

### *5.3. Social networks and safety-nets*

The inhabitants of Korail have a very strong social network. It has a strong community based activities which prevented eviction in number of instances. Typically the area developed by people migrating from the same area who tend to stay near (56.6

courtyard living with shared services there is a strong bonding among different households. Also the households who are renting the rooms act as guardians for the tenants. People tend to be self sufficient with sharing attitude with neighbours.

Findings from areas like Korail raise concerns about the future of urban planning in the face of rapid urbanization in Bangladesh, on how to reorient and reduce effects of climate change and variability for the urban poor. As Dodman & Satterthwaite (2008) state urban authorities can have a number of specific roles in reducing climate change vulnerability by introducing zoning and planning controls to help provide appropriate and safe locations for low-income households while reducing exposure to the risks of flooding, slope failure and other disasters. The presence of a strong local government with capacity to develop framework for future investments; land use management and possibility to incorporate climate change adaptation measures is a prerequisite for such activities. However in Bangladesh, although few urban centres have such plans, in most case they are 'outdated, unenforced, or unenforceable'. The following section unfolds the local government's possible contributions to mainstreaming adaptation plans.

#### **IV. SUPPORTING LOCAL COPING STRATEGIES THROUGH ADAPTATION PLANNING**

##### **1. How can local planning and governance mechanisms support existing coping strategies**

Local governments are better placed than any other government structure to deal with the effects of local climate events from a pro-poor perspective. However, adaptation to climate change is a relatively new issue for local government staff and this means that more often than not they engage with it through spontaneous responses triggered by urgent climate events usually interpreted as 'natural disasters'. By contrast to these spontaneous efforts, planned adaptation involves "a set of conscious policy and financial decisions made before signs of climate impacts become apparent or just after the first changes take place" (Deri and Alam, 2008). Ideally, spontaneous and planned adaptation should be articulated to enable the local government to develop integrated and systematic approach to climate change.

Whilst it is useful to bear in mind the distinction between 'spontaneous' and 'planned' adaptation, the former approach should not be underestimated or overlooked, as it constitutes the typical 'learning-by-doing' mechanism by which local governments can make good use of indigenous knowledge systems built up from the historical experience of urban dwellers and passed over from one generation to another one. These play a crucial role in contextualising the adaptation process, generating community-wide ownership and commitment. Planned adaptation allows local governments to draw on scientific knowledge to map and predict climate risks.

There are a number of ways in which the two aforementioned approaches can be effectively articulated. The first step towards the development of robust local adaptation plans is for local governments to effectively engage in pro-poor adap 18k-eoTc 0ament of1plannedIT7pontaneou0.s9j0.0005

strategies. Local adaptation plans can be meaningless unless community organisations of the poor are systematically engaged and their short and long term autonomous responses to climate change are understood, valued and supported.

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The recent Bangladesh Climate Change Strategy and Action Plan 2008 reiterate Government of Bangladesh's vision to eradicate poverty and achieve economic and social well-being for all the people through a pro-poor approach prioritising adaptation and disaster risk reduction. The strategy and action plan are focusing on six sectors of development. Among others these include comprehensive disaster management, infrastructure, research and knowledge management as well as capacity building and institutional strengthening. This can be an opportunity for future activities. Unfortunately most of the detailed programmes focused on rural areas and failed to address other than improving urban drainage under the infrastructure development whereas urban poor also lack food security and social protection or should be part of the comprehensive disaster risk management from the impacts of climate change.

A second area where local governments can play a crucial role in adaptation is by ensuring that land-use planning and the development of buildings and infrastructure take account of climate change risks. This poses severe

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infrastructure, whilst ensuring that such developments are climate-risk sensitive. The saving patterns among the inhabitants of Korail exemplify an opportunity of such nature.

Another area where local governments can play an active role is in the development of collective disaster risk transfer instruments to provide insurance coverage for low income groups. In the last decade, there has been increasing interest on the notion of 'risk transfer' instruments (such as policy insurance), and their linkage with reconstruction and disasters mitigation programmes. However, there is still considerable room for development and innovation, particularly in relation to local/municipal approaches that effectively target the urban poor, who are typically unable to access the insurance market. The Bangladesh National Adaptation Programme of Action (NAPA) includes the consideration of micro-insurance for the poor using institutions involved in micro lending such as the Grameen Bank (Satterthwaite et al, 2007).

## **2. How can grassroots coping strategies be mainstreamed into adaptation plans and scaled up at the city-wide level**

We started this paper by arguing that pro-poor adaptation to climate variability in cities demands a better understanding of the poor's adaptive capacity and of their autonomous coping strategies. This is because the urban poor are affected by the 'double vulnerability' of climate change and poverty, which means that they are disproportionately affected both in terms of their exposure to climate related risks and in terms of the limited resources at their disposal to response to such risks. Thus, support to local adaptation must pay attention to the differentiated impacts of and responses to climate change among different groups in society. However, there is a series of issues to take into account in order to mainstream this consideration into municipal adaptation plans in an effective and equitable way.

First, large uncertainties persist about the knowledge of observed short and long term climate effects in urban areas and in particular of how local specific conditions shape the vulnerability of the poor. Therefore, it is important to generate sustainable local means to identify and monitor climate change related impacts and to integrate risk management principles and mechanisms of knowledge production sharing into municipal adaptation policies and plans. In the process, the urban poor should be considered both as the producers and consumers of such information, addressing the striking gap in climate risk relevant information by and for the urban poor.

Second, a fundamental problem resides on the fact that external support agencies are rarely set up to understand and support local governments and local community adaptation plans. Thus there is a mismatch between the areas where increased local capacity and competence in climate adaptation is urgently needed and the flow of development cooperation resources supporting of adaptation. Bangladesh receives a significant volume of overseas development assistance (ODA)







to build resilience through the process. For that local governments need to effectively articulate between 'spontaneous' and 'planned' adaptation. This can be done in different level like from supporting saving schemes by backing their development into larger networks of savers to ensuring land-use planning and development of buildings and infrastructure take account of climate change risks and addressing security of tenure issues. These require coordination across government agencies, utility providers and funding agencies and a combination of 'structural' and 'non-structural' approaches.



