Institutional Capacity, Climate Change Adaptation and the Urban Poor

David Dodman and David Satterthwaite

1 Introduction

The urban poor frequently live in the most hazardous physical environments – at risk from diseases, floods, fires and landslides and vulnerable to the effects of climate change. Both the scale and extent of urban poverty and the exposure of the urban poor to disasters and climate change have increased rapidly in recent years, leading to increased vulnerability to changes in mean climate and to extreme events. However, the concentration of people and hazards in urban areas also provides distinct opportunities for reducing vulnerability and improving the quality of life of urban residents.

The loss of life, serious injury, damage to property, and negative effects on livelihoods caused by disasters ought not to be seen as natural events, but rather as a failure of urban management – in which institutions have been unwilling or unable to meet their obligations to urban residents (Lavell 2002). This article therefore examines the role of institutional capacity in reducing the vulnerability of the urban poor to climate change. This is viewed as requiring a series of interrelated activities involving a variety of stakeholders in urban governance, including municipal authorities, national governments, utilities and civil society organisations. After reviewing the scale and extent of the vulnerability of the urban poor to climate change and its linkages to poverty, the article considers the role of these different stakeholders in climate change adaptation and its relevance for improving the social, physical and economic wellbeing of low-income urban residents.

2 Urban poverty and vulnerability

Half of the world's current population lives in urban centres, compared with less than 15 per cent in 1900. Urban areas in low- and middle-income nations are home to more than one-third of the world's total population, nearly three-quarters of its urban population, and most of its large cities (Satterthwaite 2007). They contain most of the economic activities in these nations, and are likely to house most of the world's growth in population in coming decades (Satterthwaite 2007; United Nations 2006). There are no accurate statistics on the scale of urban poverty in many of these nations, because national statistics on poverty are based on the cost of a minimum 'food basket', and fail to take sufficient account of the need – greater in urban areas than in rural areas – to pay for non-food necessities such as housing, water, access to toilets, healthcare, education for children and the cost of travelling to and from work (Satterthwaite 2004). United Nations estimates suggest that at least 900 million urban dwellers in low- and middle-income nations 'live in poverty' (UN Habitat 2003a) with at least 650 million lacking adequate provision for water and at least 800 million lacking adequate provision for sanitation (UN Habitat 2003b). Within the hundreds of millions of people suffering from urban poverty, there is considerable variation – from those who are destitute, homeless and suffering from acute malnutrition to those that avoid poverty as long as there is no crisis (such as a drop in income, a rise in food prices, or an income-earner becoming sick or injured) – and across a wide range of groups differentiated by gender, age, ethnicity or disability (see Demetriades and Esplen, Mitchell and Tanner, this *IDS Bulletin*).

Urban poverty has a direct effect on human health and wellbeing, including infant and child survival, nutrition and life expectancy. In most low-income nations, infant, child or under-five mortality rates

Table 1 **Climate change impacts on urban areas**

Change in climate	Possible impact on urban areas
Changes in means	
Temperature	Increased energy demands for heating/cooling Worsening of air quality Exaggerated by urban heat islands
Precipitation	Increased risk of flooding Increased risk of landslides Distress migration from rural areas Interruption of food supply networks
Sea-level rise	Coastal flooding Reduced income from agriculture and tourism Salinisation of water sources
Changes in extremes	
Extreme rainfall	More intense flooding Higher risk of landslides Disruption to livelihoods and city economies Damage to homes and businesses
Drought	Water shortages Higher food prices Disruption of hydro-electricity Distress migration from rural areas
Heat- or cold-waves	Short-term increase in energy demands for heating/cooling
Abrupt climate change	Possible significant impacts from rapid and extreme sea-level rise Possible significant impacts from rapid and extreme temperature change
Changes in exposure	
Population movements	Movements from stressed rural habitats
Biological changes	Extended vector habitats

Source Adapted from Willbanks *et al.* (2007).

among the urban poor are 5–20 times more than they could be if the urban populations had adequate nutrition, good environmental health and a competent healthcare service (Montgomery *et al.* 2003). In low-income nations, it is common for up to one-third of all urban children to be stunted (Ruel and Garrett 2004).

There are important linkages between urban poverty and vulnerability to disasters and climate change. By their very nature, cities concentrate people and their homes, physical capital, industries and wastes. This can make them dangerous places to live and work, and can make their populations vulnerable to physical events that have the potential to be disasters. However, the clustering of people and enterprises also provides many potential advantages for reducing risk because of the economies of scale, proximity or agglomeration in most of the infrastructure and services that reduce risk (Hardoy *et al.* 2001). Climate change is likely to exacerbate many of the risks faced by low-income urban residents – the Intergovernmental Panel on Climate Change's (IPCC) Fourth Assessment notes 'poor communities can be especially vulnerable, in particular those concentrated in relatively high-risk areas' (Willbanks *et al.* 2007: 359). Urban areas in low- and middle-income nations already house a large percentage of the people and

Case Study 1 Climate change and urban flooding in Bangladesh

Bangladesh is a densely populated and low-lying country that faces a variety of risks from climate change. The population of the capital, Dhaka, has grown more than 20-fold in the last 50 years, and it now has more than 10 million inhabitants. Severe floods – particularly in 1988, 1998 and 2004 – caused by the spill-over from surrounding rivers have had major economic impacts. Large sections of the city are only a few metres above sea level, and the combination of sea-level rise and increased frequency and intensity of storms is likely to greatly increase these risks (Alam and Rabbani 2007).

These flooding risks can also be seen in other urban centres in Bangladesh. Khulna is a coastal city with a population of 1.2 million people. Large parts of the city are frequently waterlogged after heavy rainfall. In addition, the city experiences problems with salinisation of surface water, and it is anticipated that climate change and sea-level rise will cause this to worsen in the future.

economic activities most at risk from climate change, including extreme weather events and sea-level rise – and this proportion is increasing. The types of changes that will affect urban areas can be summarised as changes in means, changes in extremes and changes in exposure (Table 1).

The main impacts of climate change on urban areas in the next few decades are likely to be increased levels of risk from existing hazards. For poorer groups, these will present a variety of impacts: direct impacts such as more frequent and more hazardous floods (see Case Study 1); less direct impacts such as reduced availability of freshwater supplies for many cities that may reduce supplies available to poorer groups; and indirect impacts such as climate change-related weather events that increase food prices or damage poorer households' asset bases. In addition, poorer groups are disproportionately vulnerable for a variety of reasons, including:

- greater exposure to hazards (e.g. through living in makeshift housing on unsafe sites)
- lack of hazard-reducing infrastructure (e.g. drainage systems, roads allowing emergency vehicle access)
- less adaptive capacity (e.g. the ability to move to better quality housing or less dangerous sites)
- less state provision for assistance in the event of a disaster (indeed, state action may increase exposure to hazards by limiting access to safe sites for housing)
- less legal and financial protection (e.g. a lack of legal tenure for housing sites, lack of assets and insurance).

The climate change impacts noted above can be addressed and reduced through policies and practices implemented by competent urban stakeholders. The remainder of this article examines the role of urban authorities and other institutions in facilitating climate change adaptation and reducing urban poverty.

3 The role of urban authorities

City and municipal governments in low- and middle-income nations generally have the primary responsibility for a wide range of infrastructure and service provision that is essential for good living standards, livelihoods and the reduction of vulnerability to many environmental hazards (Hardoy *et al.* 2001). They are often responsible for the provision of water, sanitation, drainage and solid waste collection; for some schools and healthcare facilities; and for fire and other emergency services. They also generally have responsibility for implementing the regulatory frameworks essential for public health and safety; for example through urban planning, building and sub-division regulations, occupational health and safety, pollution control and traffic control. There are many differences as to how these are arranged, how lines of authority and accountability are structured, and whether particular services are provided through subcontracting. These responsibilities for infrastructure, buildings and services have great importance for reducing risk to disasters and to many of the likely impacts from climate change.

The characteristics of good governance – decentralisation and autonomy; transparency and accountability; responsiveness and flexibility (Tanner *et al.* 2008) – are all vital in boosting the resilience of cities to disasters and climate change. However, almost all city and municipal governments in low- and middle-income nations fail to meet many of their responsibilities or meet them only for particular

sections of their populations. This can be seen in the scale of the inadequacies in provision for the infrastructure and services that they are meant to provide (or ensure provision through other providers) and in the extent to which the homes, neighbourhoods and livelihoods of their population fall outside their regulatory framework (Hardoy *et al.* 2001). It is common for 30–50 per cent of cities' populations to be living in informal settlements with little or no public provision for infrastructure and services (Hardoy *et al.* 2001). There are many reasons for these inadequacies, including institutional legacies from colonial rule and centralisation in post-independence governments, the application of inappropriate imported models of urban planning, external pressures for dismantling or weakening the state and the refusal of many bilateral aid agencies and international non-governmental organisations (NGOs) to work in urban areas.

In relation to climate change, this critical role for urban governments arises because they have responsibility for most of the interventions that can and should reduce hazards or reduce their population's vulnerability. Pro-poor local governments can support low-income groups to obtain safe, legal land sites for housing, can improve access to justice for poorer groups, and can ensure that marginalised and disadvantaged groups are able to access and influence local political and bureaucratic systems – all of which have important implications for improving the resilience of the urban poor. They can also embrace a more systematic consideration of whose voices should be heard, and how different opinions should be included in the process of governance (Mitlin 2004). Approaches of this type also need to take into account the different deprivations that contribute to poverty, and the marginalisation of particular groups within urban society. The relationship between urban poverty, gender and climate change requires further investigation, especially in relation to the increased difficulties women face in accessing environmental resources and services. In addition, poor children are likely to face disproportionate health risks as a result of climate change (Bartlett 2008).

Urban government's spatial proximity to the consequences of climate change means that they are 'on the ground' to take an active role in adaptation and response, and are more accessible to local populations. Resilience to climate change can be boosted by greater effectiveness by local governments in meeting their current responsibilities for ensuring provision for infrastructure and services, and much of the infrastructure required to deal with the consequences of climate change is necessary for dealing with everyday risks – for example sewers and drains serve both to reduce the spread of many water-related diseases and to reduce flooding risks.

Actions undertaken in Durban, one of South Africa's largest cities, illustrate how forward-thinking urban institutions can help cities become more resilient to climate change. The Environmental Management Department in eThekwini Municipality (an expansion of what was previously Durban Municipality) has developed a 'Headline Climate Change Adaptation Strategy' for the city to highlight how key sectors should begin responding to unavoidable climate change. Most importantly, the municipality has incorporated climate change into long-term city planning, addressing the vulnerability of key sectors such as health, water and sanitation, coastal infrastructure, disaster management and biodiversity (Roberts 2008).

Urban authorities have a number of specific roles in reducing climate change vulnerability. Zoning and planning controls often contribute to the exclusion of much of the population from legal land markets, but they can be used 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 application of building standards that are appropriate to local contexts (including affordability) and applied in ways that support incremental improvements can make housing resistant to extreme weather while still enabling poor residents living in self- or artisan-built constructions to upgrade at an appropriate pace and cost. Ensuring the provision of infrastructure and services, including transportation, can enable low-income groups to live in safer physical surroundings while still being able to access employment and livelihoods opportunities. Urban authorities may be able to facilitate access to housing finance and insurance (Hammill *et al.*, Pierro and Desai, this *IDS Bulletin*), although cost-effective and affordable insurance for low-income households depends on their risk-levels being reduced by safe sites and good infrastructure and services.

Finally, urban policies can help to improve preparedness for the extreme events that are likely

to become more frequent and more intense as a result of climate change, including effective local communication systems for the spread of information and warnings before, during and after an event; taking measures to limit damage; and facilitating rapid evacuation to safer areas if necessary.

4 The role of other institutions

Good urban governance and management depends on the active engagement of other local stakeholders and a supportive national government. Indeed, the shift from 'government' to 'governance' is predicated on the involvement of a more effective framework of support for citizen groups and NGOs within more accountable and transparent local government structures. Higher levels of government have key roles in facilitating urban adaptation as they provide the legislative, financial and institutional basis within which urban authorities, the private sector, civil society and other stakeholders can act to adapt to climate change. A supportive legal system can support locally developed responses, and provide appropriate guidelines within which these stakeholders can perform adaptation tasks at the most appropriate scale. National governments can also administer funds to encourage and support locally driven climate change adaptation, including urban adaptation – this strategy is currently being explored by the Bangladeshi government through a proposed multi-donor trust fund for adaptation. In addition, central government institutions can ensure that national risk management strategies are developed, working with local governments and local risk management strategies.

International NGOs and donor organisations should have important roles in climate change adaptation at the urban scale (see Tanner, this *IDS Bulletin*). They can provide appropriate sectoral funding (e.g. for urban infrastructure to reduce climate change vulnerability), they can support the development of necessary technical and regulatory capacity, and they can support adaptation activities directly. Unfortunately, most bilateral aid agencies give a low priority to urban infrastructure, especially when considering the substantial deficits in this area in many cities (OECD 2006). One way in which aid agencies could assist in climate change adaptation could be in the creation of substantial municipal infrastructure funds to which local governments and civil society groups can apply.

Adaptation also requires commitment and action from utility providers. The water sector is likely to be particularly affected by climate change, as a result of changes in rainfall and damage to water and waste-water infrastructure from extreme events. One institutional response is through Integrated Water Resources Management (IWRM). IWRM recognises that there are multiple possible pathways to build resilience by seeking to identify and then to achieve trade-offs between water management objectives including environmental sustainability, economic efficiency and social equity (Muller 2007). Medium-sized local utility companies may be particularly well placed to adapt to climate change, as these enterprises are able to gain and retain local knowledge, to develop special services tailored to low-income residents, and to work with informal providers when appropriate (McGranahan and Lloyd Owen 2006).

The final set of urban institutions that can facilitate effective climate change adaptation and poverty reduction are civil society groups. Local authorities need to be accountable to their citizens not only through a fair and transparent electoral process, but also through engagement with community-based organisations (CBOs) and NGOs. CBOs and NGOs can act as conduits for the transfer of information between urban residents and urban authorities, but can also be effective implementers of projects to reduce disaster risk and adapt to climate change. In many nations, partnerships between local governments, water and sanitation utilities and civil society groups have extended good quality infrastructure and services to large sections of the low-income urban population (Burra *et al*. 2003; Boonyabancha 2005; Hasan 2006). They can also help to facilitate evacuation or the distribution of emergency supplies in the case of extreme events. The importance of fully involving grassroots organisations is often forgotten – as are the capacities of these groups (ACHR 2005).

5 Developing urban policies and institutions for climate change adaptation

To address the challenges of climate change for low-income urban dwellers, urban institutions need to develop a set of specific policies and strategic actions. Case Study 2 identifies some steps for a municipal adaptation strategy, but this needs to be conducted within a broader strategic framework and located within development and investment plans.

Case Study 2 Steps for city-level adaptation planning

Few specific guidelines have been produced for adaptation planning at the scale of the city. The following steps are likely to be essential in developing a municipal-level adaptation strategy:

- Identify current climate trends and future projections – including the risk of drought, flooding, and sea-level rise – and capture this information on local vulnerability maps
- Assess the climate vulnerability of the urban area at a sectoral level
- Review current development plans and priorities in the light of current climate variability and expected climate change
- Develop and prioritise adaptation options using consultative tools, including participatory assessment, social accounting matrices, and cost benefit analyses
- Develop programmes and projects to form a Municipal Adaptation Plan
- Implement, monitor, and review the Plan.

Source Adapted from Mukheibir and Ziervogel (2007).

First, a framework of this type requires an information base on current conditions, including provision for infrastructure and services, and details of environmental hazards and current vulnerabilities to extreme weather. Many cities have no such information base or one that does not cover the informal settlements. Of particular importance is understanding the impacts of 'small disasters': although infrequently reported (at least in the international media), small floods, landslides, and similar events that are likely to become increasingly prevalent as a result of climate change can have a cumulatively large impact on the lives, health and livelihoods of low-income residents. Second, this framework requires risk and vulnerability assessments at a high level of geographic and sectoral detail. This can help to identify population groups or settlements that are most at risk from climate change, and also particular threats to infrastructure (e.g. water treatment plants or power stations).

As important as the specific policies proposed above is the creation of mechanisms by which these can be encouraged within each sector and integrated. For example, if an urban centre has a strong local development plan that provides the framework for future investments and land use management, then it is possible to incorporate climate change adaptation measures into this. However, many urban centres have no such plan, or a plan that is outdated, unenforced, or unenforceable.

In this regard, the most appropriate policy for ensuring climate change adaptation in urban areas is building the capacity of urban institutions. This can take the form of financial, technical, logistical and legal support to facilitate strategic actions to address climate change that is fully integrated with development and investment plans – the benefits of which have previously been seen in facilitating improvements to service delivery (Budds and McGranahan 2003). Regional or global networks of cities can help to facilitate knowledge transfer and awareness of the key principles of adaptation to urban authorities around the world. An integral part of this process is to bring city governments and civil society organisations into a direct dialogue with bilateral and multilateral agencies. Another is to bring more attention to adaptation: at present, much of the interest within international networks of cities on climate change is on mitigation, not adaptation.

Effective urban authorities and other local institutions are key to providing the context in which individuals, households, and communities are able to make their own adaptations to a variety of issues, including socioeconomic risks, disaster risks and climate change risks. The key influence of local governments is not only what they build or invest in, but also in what they encourage, facilitate or prevent other stakeholders to do. Because of this, even urban authorities with limited financial capacity can adjust their planning and regulatory framework to support adaptation by households, community organisations, NGOs and the private sector (Satterthwaite *et al.* 2007).

6 Conclusion: towards pro-poor climate adaptation

An important part of building local capacity to reduce climate change risk involves local governments working with low-income groups, especially those living in the most hazardous locations. There are good examples that can be drawn on, including the process of 'slum and squatter upgrading', in which local governments work with the inhabitants of informal settlements to provide infrastructure and services and improve the quality of housing, in a manner that has both reduced costs and increased effectiveness. Funding activities of this sort should not be seen as eroding local government, but rather as being central to building the competence, capacity and accountability of local authorities (Mitlin and Satterthwaite 2007).

Urban authorities should have a key role in reducing many aspects of urban poverty and there are strong complementarities between this and enabling effective climate change adaptation. The actions of local governments can support low-income groups to obtain land for housing, can provide basic infrastructure and services (often through co-production), and can improve local political and bureaucratic systems, all of which are key aspects of developing capacity to address the challenges posed by climate change. In addition, the Stern Report (Stern 2007) notes that certain key areas of development action – including achieving income and food security, building robust education and health systems, improving urban planning and infrastructure provision, and better gender equality – will help to reduce vulnerability to the effects of climate change. An incorporation of these broader developmental goals can also lead to more effective community-based adaptation, with a focus on adapting to climate risks within a developmental framework, and with choices about priorities and actions being decided by communities rather than being imposed from above. But cities cannot be viewed in isolation: many of the processes affecting the ways in which climate change impacts are felt result from interactions with surrounding areas and how these are managed (whether these are movements of people, transfers of capital, or shifting patterns of disease vectors) (Tacoli 2006). Many of these processes come together in the peri-urban interface (McGregor *et al.* 2006), where social and economic tensions are exacerbated because of the frequently marginal or hazardous nature of the land on which people have settled.

There is a clear urban agenda focusing on more competent and accountable city and municipal governments, with adaptation built into development plans. Unfortunately, there is little evidence of national governments and international agencies responding to this. In most nations, national and state/provincial governments still concentrate most of the power and control over public investments, a situation reinforced by the routing of most international funding through central governments. In addition, too many climate change experts see urban change as a local issue that they do not need to understand, let alone address – yet it is through adaptation and mitigation within urban centres that much of the battle to prevent climate change from becoming a global catastrophe will be won or lost.

Effective climate change adaptation that works for the urban poor requires a firm commitment from urban institutions – including local government authorities, utility companies, local and international NGOs, and international funding agencies – to meeting the needs of this group and working with them. However, where this commitment is made, it should be seen as an opportunity to address three key issues affecting urban residents: climate change adaptation, effective local development and good local governance.

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