Institution: University College London

Unit of Assessment: 16 – Architecture, Built Environment and Planning

Title of case study:

Building climate resilience in cities of the Global South

1. Summary of the impact

Research work into the development and transference of methods for climate readiness and resilience by Allen et al has created impacts at every stage of the planning process. In major cities of the Global South, such as Dhaka and Maputo, this research has made visible the material practices adopted by ordinary citizens to cope with climate variability, and has provided a systematic evaluation for policymakers and funders of strategies for proofing cities at scale. In turn it has facilitated new approaches to risk and vulnerability assessment – for instance, by integrating new perspectives into Maputo city planning, supporting methodological approaches to projects by Oxfam, and helping to shape policy tools and funding with organisations such as the Department for International Development (DFID).

2. Underpinning research

Floods, drought, unusually high temperatures and other shocks are projected to increase around the world due to climate change. Action-research by the Development Planning Unit (DPU) in the UCL Bartlett Faculty of the Built Environment has been exploring the intersection of urbanisation and climate change, with a focus on the generation and distribution of risks, vulnerabilities, and opportunities in the urban Global South. It examines how different epistemic communities frame these challenges, and traces the planned responses and everyday practices that seek to build more resilient cities. In particular, the DPU research has highlighted the importance of moving beyond traditional governmental and developmental responses related to the management and mitigation of climate change (e.g. reducing greenhouse gas emissions, responding to natural disasters), to exploring how cities can be better adapted to adjust to the changing climate – i.e. urban planning that responds to conditions of rising sea levels, floods, or climate variability **[a, c]**.

One strand of DPU research examines the practices of ordinary citizens in the making of environmentally just and resilient urban transitions. In the project on *Adaptation to Climate Change in Cities* (2008–10), Dr Cassidy Johnson (Lecturer during the period of research) and Dr Adriana Allen (Senior Lecturer) demonstrated how people living in informal settlements in Dhaka, Bangladesh adapt to climate variability and cope with changing environments. The key innovation in this work was the proposal that significant lessons can be drawn from examining how the urban poor are already managing conditions of increased vulnerability by drawing on their social, political and knowhow capital, and revealing how these strategies can be scaled up and supported at the policy level **[e]**. Similarly, in *A Public-Private-People-Partnership for Climate Compatible Development in Maputo* (2013), Dr Vanesa Castán Broto (Lecturer) emphasises the voices of ordinary citizens, experimenting with different forms of dialogue in planning to support meaningful resident participation in the design of policy and planned responses at the local, national and international levels **[d]**. In particular, this project seeks to engage stakeholders who are traditionally excluded from the official planning process, including ordinary residents and informal traders.

The second strand of DPU research looks specifically at the future of cities by focusing on the production and regulation of urban risks and vulnerabilities associated with climate change, carbonisation and 'lock-in' energy systems, and the erosion of vital ecosystems services. *Future-Proofing Cities*, as funded by the Department for International Development (DFID) and led by Atkins UK, in partnership with the DPU (Allen, Castán Broto; and Caren Levy, Senior Lecturer) examined the environmental risks faced across 129 cities in 20 developing countries. They developed five urban 'typologies' or trajectories to support the design of interventions suited to specific environmental conditions and city types. These trajectories comprise: energy intensive cities with significant carbon footprints, cities affected by major climate hazards, cities with risks to regional support systems (water and food), cities facing multiple risks and cities with a low current risk profile. Over 100 policy options for future-proofing were scrutinised against their relevance to different urban trajectories of change, different levels of vulnerability, as well as their capacity to deliver integrated social, environmental and economic benefits and the capacities required for their

successful implementation (governance, planning, finance and delivery requirements). The research reveals that the possibilities of cities to be resilient to multiple environmental risks are not just determined by their past trajectories, current vulnerabilities and future risks – but can be activated through sensitive diagnosis and wise interventions **[b]**. The DPU team provided strategic guidance on the development of the analytical framework, and wrote up the case studies on these typologies in Bangkok, Maputo, Bangalore, Karachi and Nairobi. This research provided a nuanced framework to assess not only the multiple environmental risks faced by cities in the developing world but also the different degrees of vulnerability affecting their citizens.

3. References to the research

[a] Allen, A. and Castán Broto, V. (2013) 'Second Urbanisation Wave', in Swilling, M., Robinson, B., Marvin, S. & Hodson, M. (eds.) *City-Level Decoupling: Urban Resource Flows and the Governance of Infrastructure Transitions.* Report for the Cities Working Group – International Resource Panel, published by the UN Environment Programme. [ISBN: 978-92-807-3298-6; Available at: http://www.unep.org/resourcepanel/portals/24102/pdfs/Cities-Full_Report.pdf, PDF]

[b] Atkins, in collaboration with the Development Planning Unit (2012) *Future Proofing Cities: Risks and Responses to Inclusive Urban Growth in Developing Countries*. Final Report and website. London: DFID/Atkins/UCL. [Available at: http://www.futureproofingcities.com/]

[c] Castán Broto, V., Allen, A. & Rapoport, E. (2012) 'Interdisciplinary Perspectives on Urban Metabolism', *Journal of Industrial Ecology*, 16 (6): 851–861 [DOI: 10.1111/j.1530-9290.2012.00556.x]

[d] Castán Broto, V., Oballa, B. & Junior, P. (2013) 'Governing climate change for a just city: challenges and lessons from Maputo, Mozambique', *Local Environment: The International Journal of Justice and Sustainability*, 18 (6): 678–704. [DOI: 10.1080/13549839.2013.801573]

[e] Jabeen, H., Johnson, C. & Allen, A. (2010) 'Built-in resilience: learning from grassroots coping strategies for climate variability', *Environment and Urbanization*, 22 (2): 415–431. [DOI: 10.1177/0956247810379937]

The quality of the underpinning research is demonstrated by the following grants:

- Johnson, C. (PI) & Allen, A. (CI), in association with BRAC University, Bangladesh, *Adaptation to Climate Change in Cities*, British Council Higher Education Link Programme, British Council Bangladesh, March 2008 – February 2010 (£20,000). This grant led to output [e] above.
- Castán Broto, V., Allen, A. & Levy, C., led by Atkins, *Future Proofing Cities in Developing Countries*, DFID, October 2011 – May 2012 (£99,500). This grant led to output [b] above.
- Castán Broto, V. (PI), *Development of a 'Public Private People Partnership' for climate compatible development in Maputo, Mozambique*, Climate and Development Knowledge Network/FUNAB, January 2012 – July 2013 (£120,000). This grant led to output [d] above.

4. Details of the impact

The DPU's research has contributed to building climate preparedness and resilience in the urban Global South by enhancing existing strategies adopted by affected communities, and introducing new methods for socio-technological structures to deal with cumulative and sudden shocks. The transfer of specialist knowledge holds impacts for policy-makers in Bangladesh, Mozambique, and India, within aid organisations (e.g. DFID and Oxfam), and for urban planners and residents of vulnerable cities. Impacts range from enhancing citizens' voices in local governance structures and supporting transparent decision-making to guiding aid policy and governmental interventions, and aiding urban planners through policy tools to plan for more resilient cities. Perhaps most significantly, DPU research contributed to culture shifts in development and donor organisations around the world, reinforcing changes in fundamental approaches to climate change resilience.

At the local government level in the largest cities in countries like Bangladesh and Mozambique, research was used to build resilience through policy advice to governmental programmes. Moving from mitigation to adaptation is critical in Bangladesh, frequently affected by the effects of climate variability and climate change. Dhaka has experienced nine major floods in the last 55 years, disproportionally affecting the 3.4 million vulnerable urban poor with limited/no access to services.

The act of documenting community responses to climate variability **[e]** facilitated the development of strategies that moved from climate risk mitigation to planned adaptation, via policy and financial decisions seeking to address climate impacts before or soon after they were manifest. Research recommendations by DPU supported policy and planning for the development of pro-poor land-use planning and tenure security options within Dhaka's local government, and on the design of buildings and infrastructure to reduce climate change risks. This dialogue was facilitated through several focus group discussions and a multi-stakeholder workshop in August 2009, which had 46 participants, including community members, governmental actors and representatives from organisations working on urban poverty, climate change and urban planning issues in Bangladesh. Three lines of action were identified: access to basic urban services; land-use planning and the built environment; and disaster management strategies. The ongoing actions by municipalities and the coping strategies of the urban poor were mapped to identify synergies and generate recommendations for future action. The resulting strategies were consolidated at the multi-stakeholder workshop and endorsed in the plans and programmes of governmental agencies **[1]**.

Likewise, in Maputo, an innovative participatory research process encouraged working partnerships between diverse actors with the aim of bridging the gap between policy rhetoric and action. This city of 1 million inhabitants (half below the poverty line) is subject to frequent flooding and vulnerable to rising sea levels. Communities described the drainage faults associated with uncontrolled waste disposal as the main factor influencing vulnerabilities to climate change in the research area, Chamanculo C district. Seeking to address this challenge, in partnership with the National Fund for the Environment of Mozambique (FUNAB), Reading University and York University, DPU research supported networking in 2012-13 between residents, private sector actors, and government authorities, including the Ministry for Coordination of Environmental Affairs (MICOA), the National Disaster Management Institute (INGC), and Maputo Municipality.

The first step involved the development of a process of community organisation that led to the constitution of a local planning committee on climate change (CPC). These CPC members represent different interest groups rarely represented in such negotiations, such as the elderly, youth, housewives, traders and salaried workers. The CPC has five community members elected by local residents, who met weekly from April to July 2012. They held meetings with experts and institutions, working independently of the DPU/FUNAB project team to develop and implement a Local Action Plan for Climate Compatible Development with the municipal government **[2]**. While this research engaged actors already concerned with climate change (MICOA; INGC), through the CPC it also brought climate change to urban governance bodies where it previously did not exist.

Real changes in the lives of Maputo residents were already underway towards the end of the impact period. The CPC had begun negotiating the implementation of the strategies emerging from its dialogues within the informal settlement of Chamanculo C. These included new provisions for recycling and composting centres, and the establishment of waste collection points to alleviate the impacts of flooding on blocked drainage. To achieve their goals, the CPC established links with local associations, private operators and NGOs involved in waste management. Out of the Local Action Plan, drawn up in July 2013, the CPC has also begun to develop an environmental education programme with the Maputo University Eduardo Mondlane for better training in climate change issues, correct usage of water, and treatment of domestic waste, and it used this educational process to extend networks within and between communities, and to mobilise residents for the regular cleaning and maintenance of drainage channels **[2; p.9]**. In a city whose fast and unregulated growth had outstripped the provision of basic services, particularly in the context of a changing climate, this community-led programme demonstrated to local policy-makers that residents – even the relatively uneducated – can handle climate information if there is an entry point that relates such information to their own experience, such as flooding **[3]**. Policy makers subsequently have no vowed to extend this programme to other neighbourhoods.

Working at the NGO level, DPU researchers are also closely involved in the design and operationalisation of new approaches to the study of climate change resilience in Latin America. In 2012–13, the DPU advised Oxfam's Latin America and Caribbean (LAC) office on managing risk and working with vulnerability in relation to disaster risk reduction. Dr Camillo Boano (Senior Lecturer) and Dr Alexandre Apsan Frediani (Lecturer) facilitated a three-day workshop in 2012 with government officials, civil society organisations, and Oxfam officers from La Paz, Guatemala and

the regional office in Mexico City. This contributed to ongoing action within Oxfam's LAC office in re-shaping their urban strategies in relation to risk and vulnerability reduction, shifting again from mitigation strategies to addressing the actual root causes of risk production.

For example, this collaboration has redefined the initial terms of reference of a project undertaken in La Paz and Guatemala City away from more traditional reactive mitigation strategies towards the exploration of local and innovative adaptation plans **[4]**. This was demonstrated in the resulting report, *Exploring Oxfam's room for manoeuvre to address the production of urban risk*, which sought to highlight the social drivers of risk in La Paz and Guatemala City **[5; especially pp. 6, 10, 22]**. In particular, DPU research has underpinned recommendations for further action, including expanding the knowledge base on intra-community perceptions of risk (disaggregating community experiences by gender, disability, tenure status, etc.), as well as redefining the understanding of urban risk as a social and political product; and collapsing the divide between urban planning and the field of disaster risk reduction, which as noted has tended to be more reactive **[5; pp. 51, 53]**.

The *Future-Proofing Cities* project **[b]** also spurred international donors to reassess their aid priorities to support effective local responses that could support resilient urban development. The project recommendations were adopted by DFID in 2012 as a diagnostic tool to guide its climate-change portfolio and mechanisms for funding, resource, and project allocation throughout Asia, Latin America, and Africa **[6]**. The reach of this impact on international debates is demonstrated by the fact that the *Future-Proofing Cities* website has received over 300,000 hits since December 2012 and the report was downloaded over 2,000 times by users in multiple countries and organisations. This included municipal governments, leading developers and architects (e.g. Balfour), strategy consultants, technology providers (e.g. Siemens), funding institutions, and water and energy companies in the Global South. It also attracted the attention and endorsement of organisations such as the World Bank **[7]**, Rockefeller Foundation, and Cities Alliances **[6]**.

Since March 2013, the same model has been applied in two Indian cities: Bangalore and Madurai, implemented through *Future-Proofing Indian Cities* with £450,000 committed by the Climate and Development Knowledge Network (partially funded by DFID) **[8]**. This is using the *Future-Proofing Cities* framework to undertake a participatory action planning process to develop urban risk diagnostics and action plans for Bangalore and Madurai. The diagnostic stage was completed in July 2013 and informed discussions with the state and municipal governments, service utilities and civic society organisations. Stakeholders in both cities prioritised a focus on the rehabilitation of infrastructure to develop future proofing strategies, which will inform the subsequent stages of the programme. In Madurai, this was endorsed at a city-wide consultation in September 2013 organised by Development of Humane Action (DHAN) Foundation – now a partner in the project – which was attended by over 30 officials from the municipal corporation, plus other representatives from the City Technical Advisory Group (CTAG) and City Volunteer Technical Corps (CVTC).

5. Sources to corroborate the impact

[1] Adaptation to Climate Change in Cities: Looking at Dhaka from the Built-Environment Perspective. *Workshop Report.* 25 August 2009 [Available on request]

[2] Climate Planning Committee, Bairro of Chamanculo 'C', Maputo, *Local Climate Change Action Plan,* July 2013 [Available on request]

[3] Statement provided by Executive Secretary of the National Fund for the Environment of Mozambique (FUNAB) [Available on request]

[4] Bremaud, I. & Achi, I., 'Urban settlements on high risk land: relocation, mitigation, and prevention', *Terms of Reference*, Oxfam Latin America & Caribbean, 2011 [Available on request]

[5] Boano, C., Frediani, A., Aston, T., Chacón, M. & Mazuelo, L., *Exploring Oxfam's room for manoeuvre to address the production of urban risk*, 2013 [Available on request]

[6] Statement provided by Principal Economist for Atkins UK [Available on request]

[7] *Future-Proofing Cities* report as featured on the World Bank's headline page on urban resilience [http://go.worldbank.org/B9J3LDIZZ0], plus also data from statistical report about traffic on the *Future-Proofing Cities* website [Available on request]

[8] Colebourn, E., 'Planning for a better and more resilient future for Madurai slum dwellers', *Climate & Development Knowledge Network*, 4 September 2013 [http://bit.ly/1fiIYDO]