BUILDING URBAN FLOOD RESILIENCE

Integrating Community Perspectives in Kibera

A project by Kounkuey Design Initiative in 2015 and 2016, funded by the Swiss Re Foundation

Flooding on Ngong River, Kibera, April 2013 Image: Jason Patinkon
Project Summary

“Around here the river is associated with death and destruction of property”, Rose Odinga, Kibera Resident, April 2013.

In 2015 and 2016 KDI will be working together with residents to build the resilience of communities in Kibera to adapt and respond to flooding. The overall objective of this project is to create a “toolkit” that can be used to implement flood risk reduction strategies in Kibera (and ultimately in other informal settlements) while incorporating local perspectives. The toolkit will comprise reliable data and information from the community level, flood mapping developed through hydrological modelling and physical surveying, flood risk assessment incorporating community perspectives on risk, and policy prescriptions for applying the tools in Kibera and elsewhere.

The implementation of social resilience projects (e.g. flood management committees, awareness raising, local environmental management) and structural measures (e.g. landscape-driven engineered flood protection at a local scale) as part of the project will pave a way for our governmental partners to adopt the approach at scale.

This project is a next phase in KDI’s work on bringing together the issues of public space, water, sanitation, flooding and watershed remediation, from the perspectives of community, but also from the perspective of supporting appropriate governmental engagement. The project is built upon the learning from previous Kibera initiatives, in particular ‘Site, Settlement, Watershed’ and ‘WATSAN Portal: Kibera’ (watsanportla.net). The collaboration brings together residents, planners and policy makers with experts in vulnerability, flood risk assessment, community participation and the human impacts of infrastructure.

The Context: Flooding in Kibera, Nairobi

The occurrence of floods is the most frequent of all natural disasters (Jha et al, 2013). In a recent survey of 100 municipalities, the Rockefeller Foundation found that flooding tops the list of ‘resilience challenges’ for cities. In Kenya 2.09 million people were affected by flood-related disasters between 1990 and mid-2004 (EM-DAT database). In slums, where 1.5 million of Nairobi’s residents live, the twin trajectories of rapid urbanisation and increased flooding, driven partly by climate change, collide.

Flooding in Kibera, the largest informal settlement in Nairobi, causes death and destruction annually, and is a regular news item. Kibera is located on the Ngong River, one of the three major river systems in the Nairobi River Basin, with an estimated total of 30,000 people living within 30m of the main watercourses (KDI, 2014). In Kibera the cheapest rents are found along the rivers and streams where the risk of flooding is highest. The poorest and most vulnerable residents are willing to risk their lives and assets to have a chance of staying in the city. From the Team’s experience of living and working in Kibera, numerous structures are washed away each year destroying the limited assets of poor households, halting economic activity, contaminating water supply, leading to disease outbreaks, and displacing residents.
The Barriers: Existing Policy and the need for Consultation

The only concrete policy for flood protection that currently exists in Nairobi designates a blanket, 30m riparian zone within which all structures are deemed illegal. In 2009 the National Environmental Management Authority (NEMA) estimated that implementing the policy would require the eviction of 127,000 people along the Mathare, Nairobi, and Ngong rivers at a cost of 1.8 Billion KES (Nation, 2009). This policy has created tensions between residents and implementing agencies, resulted in significant protest, and proved unenforceable. Many observers have advocated for a more nuanced approach to managing urban flooding to avoid mass evictions and potential conflict, including Amnesty International who labeled this policy as potentially “socially and economically disastrous for thousands of people” (AIP, 2009).

There is a clear gap between the scale of the issue and the current knowledge and capacity-to-respond within governmental and non-governmental organisations. This is not exclusive to Kibera but consistent in other rapidly urbanising cities in the region and in many cities across the developing world. A consistent challenge is that community perspectives on these issues have rarely been integrated into planning processes (Baker, 2012). This lack of context has led to an over-reliance on poorly planned relocation, causing conflict and insecurity in many cases. At the same time heavy infrastructural solutions can incur significant cost and have limited flexibility and robustness in the face of environmental (climate) or social changes. There is great potential to consider how lower-cost, non-structural approaches that support local resilience can create an integrated approach to flood risk management alongside traditional spatial planning and policy responses (Jha et al, 2012). Examples include early warning systems, flood awareness campaigns, flood management committees and local emergency response centres (ibid). However case studies of good practice in design and implementation of ‘integrated urban flood risk management’ in the context of unplanned settlements are currently limited in scope and scale, and geographically dispersed.

Relative costs and benefits of flood management options (adapted from Ranger and Garbett-Shields, 2011)

Based on this situation these are the following the following overarching priorities have been established:

1) The need to develop an approach to flood modeling and risk-mapping that is applicable in the informal context and integrates community-level information on multiple hazards and risks;
2) The need to demonstrate the validity of a broader menu of flood management options that focus on building social cohesion and resilience, alongside appropriate infrastructural and policy measures;
3) The need to identify and implement social resilience projects (e.g. early warning systems, flood management committees, emergency response centres) that demonstrate the low-cost, high-benefit value of these approaches;
4) The need to build the capacity of institutional stakeholders to undertake integrated flood risk management and implement flood management options in a consultative and collaborative fashion that incorporates conflict-sensitivity and the social dimensions of resilience.
The Approach: Understanding the Problems

To develop a more nuanced approach to flood risk management, a better understanding of the impacts of flooding on the urban poor is required. Demographic surveys undertaken by KDI in Kibera over the last two years in over 1,500 households show that an estimated 30,000 people live in the 30m zone in Kibera alone (KDI, 2014). Why do people live in these areas? How do people assess risk? What are the social and economic impacts of flooding? What coping strategies do people use? Evidence from our own work with affected groups suggests some answers to these questions, but a comprehensive study is required to fully define the issues, and to understand potential solutions that can work in context, and within the framework of local, municipal, and national authority structures.

In this project the challenges faced by residents will be defined through extensive consultation with Kibera residents and community groups, in order to elicit reliable information on existing approaches to flood management, adaptation, coping, and vulnerability to flooding. Consultation will be undertaken using a combination of household surveys, focus groups, and community workshops, and will mobilise existing community networks established through KDI’s multiple projects in the affected areas. Concurrently, KDI will work with institutional partners at the local (chieftaincy), municipal (City County) and national (Ministry of Environment) level to clarify existing structures, policies, and available data. The proposed consultation will develop new information on the impacts of flooding in Kibera and will put KDI and partners in a unique position to demonstrate the costs and implications of the current policy approach, and subsequently to look towards alternatives. The location, focus, and content of the consultation will we believe be a first for Nairobi and the wider region.

Implementation: Using the ‘toolkit’ to develop resilient projects

The product of the consultation will be the development of a flood hazard map. We will build this map using existing...
topographical and hydrological data calibrated against field data. The overlaying of flood hazards with land-use information and community-level information, will create a flood-risk assessment that is grounded in the physical and social context of Kibera, to be used as a tool for assessing context-appropriate, sustainable and resilient solutions.

Using the flood risk assessment we will explore the potential of a decision-making ‘toolkit’ that will support and demonstrate integrated urban flood risk management in Nairobi. In order to provide evidence to our institutional partners that such a toolkit can be applied the project also includes the creation of two physical flood protection schemes in Kibera identified and developed using the toolkit. These schemes will improve flood resilience and create public spaces as environmental buffer zones to flooding. These physical projects will ‘ground-test’ the effectiveness of the tool and also pilot landscape-driven engineering approaches to flood protection that could be used at multiple scales and locations. The ultimate goal of the project is to influence approaches to spatial planning for flood alleviation not just in Kibera and Nairobi, but in other rapidly urbanising cities around the world.

Potential for Scaling

As slums are consistently located along natural drainage paths in rapidly urbanizing cities (Parikh, 2001) it is expected that a ‘framework’ for addressing these issues has the potential to be applied in multiple contexts. Rapid urbanisation in low and middle-income nations tends to take place in geographically marginalized and relatively high flood-risk areas, thereby placing an increasing proportion of the economies and populations at risk (Bicknell et al., 2009). Though the context in each slum varies, fundamental challenges of informal housing encroaching in flood zones and a lack of an implementable policy and decision-making framework to address the issue, is consistent. By defining the problem in a major slum we will be in a unique position to test how such a ‘framework’ can address the common themes of flooding for the urban poor while allowing for context-appropriate solutions. The project team has the local presence, community process, and technical flood-risk and engineering capabilities to ‘ground-test’ the social resilience solutions identified, as well the design skills to develop and ultimately build, physical flood risk-management solutions at a local scale (such as landscape-driven environmental...
engineering approaches). This capacity to demonstrate the applicability of the approach, both to residents and municipal and national-level decision makers, will be a key component of the scaling of the approach.

**Project Partners**

**Kounkuey Design Initiative** KDI is a non-profit design and community development practice that partners with people living in extreme poverty to help them physically transform their communities, and in the process, improve their quality of life. Since 2006, KDI has been actively working in Kibera towards improving the polluted waterways that weave through the settlement. KDI’s Kibera Public Space Project is a network of active, and attractive community hubs made up of Productive Public Spaces (PPS). Since 2006 we have built six PPS in previously flooded areas and are in construction on our seventh. All the projects include a component of flood protection as well as environmental, social and economic programs. [www.kounkuey.org](http://www.kounkuey.org)

**The Ministry of the Environment, Water and Natural Resources: Nairobi River Basin Rehabilitation Programme (NRBP)** The NRBP is a multi-stakeholder initiative that brings together the Government of Kenya, development partners, the private sector and civil society. The main objective of the NRBP is to rehabilitate, restore and sustainably manage the Nairobi River Basin in order to provide improved livelihoods, enhance environmental quality and values through well regulated economic and recreational ventures. The NRBP is supervised by the Office of the Prime Minister and brings together 17 key governmental Ministries and agencies. [www.environment.go.ke](http://www.environment.go.ke)

**Buro Happold Engineering** BH is a highly innovative engineering consultancy with offices in 11 countries delivering creative building and city solutions for an ever-changing planet. BH’s world-renowned Water Team believes in “cloud to coast” integrated water management, that no one part of the water cycle can be divorced
or considered in isolation from that of another. www.burohappold.com

**International Alert** One of the world's leading peacebuilding organisations, with nearly 30 years of experience laying the foundations for peace. The Environment, Climate Change and Security team work on the links between climate change and community resilience, and opportunities for positive responses to climate and environmental change and disasters. www.international-alert.org

**Dr. Anna Tompsett, Stockholm University** Anna is an Assistant Professor in the Economics Department at Stockholm University and a Fellow of the Center for Development Economics and Policy at Columbia University, New York. She studies the impacts of public goods on human development, particularly with respect to infrastructure. annatompsett.com

**References:**

- **Amnesty International Publications, 2009.** 'Kenya The Unseen Majority: Nairobi’s Two Million Slum-Dwellers', Index: AFR 32/005/2009
- **KDI, 2014:** In Oct. 2014 Kounkuey Design Initiative (KDI) delivered a survey covering 765 households adjacent to the Ngong River. Extrapolating from this and cross-referencing against demographic information on population gathered during KDI’s 2013 survey of over 1,300 HH gives the projected number which is consistent with NEMA’s own estimate.
- **Nation, 2009.** ‘127,000 living near Nairobi River to be moved’, Daily Nation, April 14, 2009. nation.co.ke/News/-/1056/560462/-/u49ljw/-/index.htm

For more information about the project please contact Joe Mulligan:
joe@kounkuey.org