



Using Future Scenario Planning as a tool for informed decision making on infrastructure interventions in Kibera, Nairobi in Kenya



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ABSTRACT

This paper focuses on the use of Future Scenario Planning and an adaptation of the Sustainable Livelihoods Framework as analysis tools for informed decision-making in a community workshop. The aim of this methodology was to assess the perceived impacts of two infrastructure interventions for flood mitigation (local drainage improvement and local flood protection by gabions along the river edges) in the Andolo community in Kibera, Nairobi, in Kenya. Future Scenario Planning was used as a visualisation method for the changes each intervention could bring to the community and the perceived impacts were measured using the assets component of the British Department for International Development (DFID)'s Sustainable Livelihoods Framework. The exercise was delivered as a two-day workshop, which ensured community engagement and facilitated co-decision making of an infrastructure intervention. The process was helpful to ensure sustainability in the use and maintenance of a public space, as well as for initiating conversations within the community regarding critical infrastructure and prioritisation of interventions for mitigating immediate risks.

1. Introduction

Regional climate change can pose severe risks—which include water-related diseases, destruction of property and death—for poor urban-dwellers, who are disproportionately affected by its impacts (Mulligan, Harper, Kipkemboi, Ngobi, & Collins, 2017; Thorn, Thornton, & Helfgott, 2015). Rapid urbanization and global climate change are likely to aggravate these risks, as extreme rainfall events are projected to increase (Latif, Semenov, & Park, 2015; Mitra et al., 2017). Residents of Kibera, Nairobi's largest informal settlement, face flooding risks on a biannual basis; a risk which is compounded by poor drainage and solid waste management, and which has become the greatest natural hazard faced by the city (BuroHappold Engineering, 2017a; Juma, 2017; Mitra et al., 2017; Mulligan et al., 2017).

Kounkuey Design Initiative (KDI) is a Non-Governmental Organisation (NGO) that works with residents of impoverished communities to develop, design and create low-cost, high-impact built environments (Productive Public Spaces; KDI, 2016a). In Kibera, they mainly collaborate with established Community Based Organisations (CBOs), to co-produce projects and provide support for long term maintenance and operation. During 2015 and 2016, the main focus of

the organisation was to build resilience in communities of Kibera to better respond and adapt to flooding (Mulligan, Harper, & Ngobi, 2015). KDI collaborated with the Water Team from BuroHappold Engineering to create a tool for mapping the flooding extents in Kibera (BuroHappold Engineering, 2017b; Mulligan et al., 2017). Through this tool, Andolo was identified as one of the most vulnerable communities to flood impacts within Kibera. The organisation held several workshops with the community to express their research findings and investigate specific challenges this community faced, in order to identify infrastructural needs as well as to identify a suitable location for the delivery of a public space.

This paper focuses on a tool for participatory informed decision-making which enabled members of Andolo community to identify immediate infrastructural needs in order to select appropriate infrastructure measures to tackle flooding in their community. These aims were served through a methodology which combined Future Scenario Planning with the Sustainable Livelihoods Framework of DFID. The novelty of this decision making tool is that the participating community members defined the framework against which their current situation, and each proposed intervention was assessed, in order to decide which intervention would benefit them the most.

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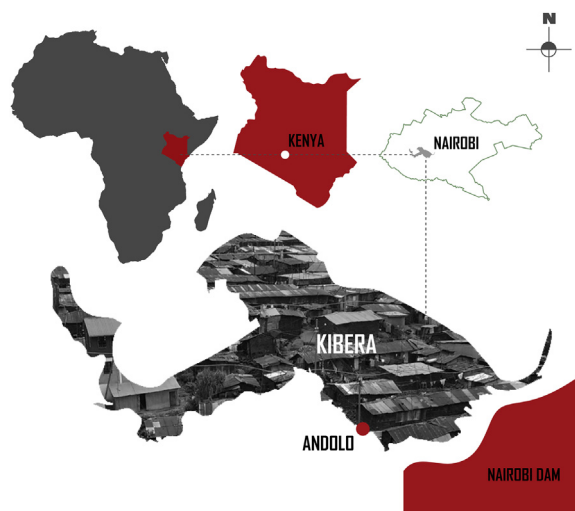


Fig. 1. Map of Kibera and location within Nairobi, Kenya. (Source: Developed by Kounkuey Design Initiative with adaptations by the main author).

1.1. Context

Kibera is located on a hill approximately 5 km away from the central business district of Nairobi, Kenya's capital (see Fig. 1; Map Kibera Project, 2010). The settlement is adjacent to the Ngong River and its tributaries, and is subdivided in 13 villages¹ that cover 225 ha (Guillet, 2014; Mitra et al., 2017; Mulligan et al., 2017). It is considered among the most insecure, unsanitary and dense slums of East Africa (Skilling & Rogers, 2017). The estimated population ranges from 235,000 to 270,000, and an estimated 30,000 people live within 30 m of the main watercourses (Mulligan et al., 2017; Map Kibera Project, 2010). Land tenure security in Kibera is non-existent, rents range from informal rental to squatting, and the threat of eviction is a constant reality (Guillet, 2014; Umande Trust et al., 2007). Dwellings are semi-permanent and host an average of 5 people per household (Umande Trust et al., 2007). Basic infrastructure and services—such as storm water drainage, surfaced roads and footpaths, waste collection systems, electricity supply, and street lighting—are generally insufficient or lacking (Cronin & Guthrie, 2011; Muthoni Kagiri, 2008).

Andolo is a community of Lindi village, located along the flood plain of Ngong River in the South East of Kibera, upstream from Nairobi dam. The community has reclaimed land by altering the river's path (see Fig. 2), which has put it at high risk of flooding, both from the Ngong River and surface water runoff that overtops the informal drainage channels. It was identified by KDI as hosting some of the newest settlers of Kibera (see Figs. 3 and 4), as it offers some of the lowest rents (KDI, 2016b). Access to Andolo is challenging and it is estimated to have the highest rates of crime, insecurity and under-employment of Kibera (Mulligan et al., 2017; KDI, personal communication, June 26, 2016). As of 2016, the community was relatively new, less established and with low social ties, which posed a threat to social cohesion (Harper, personal communication, June 26, 2016).

There is a lack of information about the area. At the time of this study, there was no official sociodemographic data, no other NGOs working with the community, nor any CBO registered with the Government of Kenya in the immediate community of Andolo (KDI, personal communication, June 26, 2016). In 2015 and 2016, KDI held workshops with the residents of Andolo to further explore the challenges the community experiences (KDI, 2015). These workshops,

¹ These villages are Soweto East, Soweto West, Kisumi Ndogo, Kianda, Gatwekera, Silanga, Makina, Lindi, Raila, Mashimoni, Kambi Muru Laini Saba and Mugomoini (Guillet, 2014).

combined with the survey, showed high levels of riverine and drainage flooding that damages structures, bridges and access ways (see Fig. 3); lack of sanitation; public health issues such as flood-related injuries, diarrhoea reported among 31% of children and cholera reported in four households; inadequate access to services; and insecurity, crime and under-employment (KDI, personal communication, June 26, 2016). Despite these challenges, KDI determined that the community had potential to collaborate based on its responsiveness to household level challenges through the Nyumba Kumi Initiative.²

1.2. Literature review

There are significant benefits from adopting infrastructure development strategies that include the participation of informal settlement dwellers, especially from those that promote local economic development and mainstream employment-intensive approaches (Majale, 2008). This participation can enable communities to make informed choices and decisions, as residents have access to information and the outcomes of an intervention are clear and transparent (Donovan, 2012; Davidson, Johnson, Lizarralde, Dikmen, & Sliwinski, 2007). The conditions necessary for successful community-based projects include outlining clear boundaries of roles and responsibilities of all the stakeholders, for the facilitating agency to act as a supporting entity in lieu of a project manager, and training programmes embedded within the process of engagement (Cotton & Franceys, 1994). In addition, communities play an effective role in delivering, operating and maintaining basic urban infrastructure (Majale, 2008). Specifically in relation to Kibera, there is evidence to suggest the need for strong engagement with the community members at the outset of slum upgrading programmes to ensure participation during implementation (Cronin & Guthrie, 2011; Meredith & MacDonald, 2017). Infrastructure interventions can potentially lead to positive outcomes in informal settlements if the interventions meet the needs and priorities of local residents. (Parikh, Parikh, & McRobie, 2012). In light of this, the authors developed a novel participatory approach for decision making on infrastructure provision, which incorporates Future Scenario Planning and the Sustainable Livelihood Framework as described below.

1.2.1. Future Scenario Planning (FSP)

Future scenario planning (FSP) is an exploratory tool for conceiving different futures, or scenarios, and their plausible outcomes (Oppenheimer, 2016; Lienert, Scholten, Egger, & Maurer, 2014; Lindgren & Banhold, 2003). It can be used for conceptualising outcomes that result from taking different approaches to the same initial event, and can be useful for medium and long term planning of future uncertainties (Lindgren & Banhold, 2003; Ringland, 1998). FSP can be of help in understanding the logic of events and assist in exploring a wider range of possible outcomes that could occur quicker than expected (Roxburgh, 2009). Developing scenarios can be useful for generating deeper insights into the underlying drivers of change as well as identifying previously overlooked ones, in addition to supporting the identification of key players, key factors and driving forces that could exert influence (Roxburgh, 2009).

FSP has been amply used by business strategists since the 1960s, and the most notable example is the Shell case (Ringland, 1998; Roxburgh, 2009; Wack, 1985). However, in more recent years, it has been further used in tourism forecasts (Page, Yeoman, Connell, &

² Nyumba Kumi Initiative was introduced by the Government of Kenya as a community policing strategy at household level with the aim of achieving safe, sustainable neighbourhoods (Leting, 2017; Otieno Andhoga & Mavole, 2017). In Andolo, it is also used an informal system of organisation in which a group of households associate to create social ties and provide social support, i.e. raising funds to help families within the group to cope with challenges (KDI, personal communication, June 26, 2016).

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